

£3

ALL FORMATS

Wireframe

LIFTING THE LID ON VIDEO GAMES



SUPER MEAT BOY FOREVER

Indie's biggest platform hero
makes his bloody return

Prison Architect
Introversion's dramatic
fall and triumphant rise

Issue 17 £3 wfmag.cc



Story mode
How games generate
atmosphere with words



UPGRADE
TO LEGENDARY



AG273QCX
2560x1440

144 HZ

1 MS

Curved

QHD

FreeSync2

amazon

BOX

ebuyer.com

AOC
GAMING

f @aocgaming

t @aoc_gaming

i @aocgaming

aocgaming.com

As originally intended

W

e're in trouble. Slowly, every day, we lose a little bit of our history. Another capacitor pops. Another laser dims. Another cathode ray tube fails. It's

becoming increasingly hard for future generations to accurately trace how we got to today.

Yet, it's a better time than ever to play retro games. Following Nintendo's little NES and SNES consoles, we have an onslaught of chibi, HDMI-compliant devices. Sega's Mega Drive Mini is nearly with us, and we have news of a baby PC Engine gestating. But they all sit atop a huge compromise: they're based on emulators.

Emulators are software packages built to mimic the hardware of another device as best they can; in games, this means playing software from one hardware platform on another. As the years have gone on, emulators have become so functional and accurate that they have become almost indistinguishable from the real thing. But that is as much a failing of our memory as it the software.

Picture the sprite from your favourite retro game in your mind. How did it look? Chances are you saw some crisp, square pixels in your mind's eye. But where has that image come from? If you played games between the late seventies to the end of the nineties, you were likely playing on a consumer-grade TV through a crappy connection with a smeared, flickering monstrosity the end result.

The crisp pixel art of today is the result of emulators, flat panel TVs and the collective amnesia they've caused. Game artists of yesteryear didn't build for 4K screens; they built their art for the glass tubes of then. There were many tricks of cathode-ray scanning that would add shimmering or semi-transparency, while dithering would create smooth gradients when squeezed through composite video.



WILL LUTON

Will Luton is a veteran game designer and product manager who runs Department of Play, the games industry's first management consultancy. He is the author of *Free-to-Play: Make Money From Games You Give Away* and has worked with Sega, Rovio, and Jagex. He is also an avid retro games and pinball player.

#17



Emulators, then, are pixel-perfect to the point of imperfection. They've tricked us all into believing they're right. But there's another, more invisible, and more deadly trick that emulators play on us: input lag.

Emulators inherently introduce additional time from an input being made to the result being displayed on the screen. Emulator lag is often in the realm of two or three frames, or 0.04 seconds. While that might not seem like much, especially considering human reaction times to visual stimulus are 0.25 seconds, you notice it. Consciously or not.

Games are often designed to put us in a state of flow, which is achieved by pushing us to the absolute limits of our ability to react to stimulus. Game designers spend a lot of time tuning many different parameters in hope of nailing flow. The best tuned are the absolute classics of retro gaming. So when we add that 0.04 seconds of input lag, the timing gets a little out of whack, we miss more jumps, crash into more corners, and we lose something not so obvious: game feel.

So how then do we play games of the past in the way they were originally intended? The reality is we can't. During the time I've spent fiddling around in the back of vintage broadcast monitors, I've come to realise we can only ever play a facsimile of the experience we remember with such fondness. There's something important missing from even the most accurate retro gaming setup: a sense of time and place.

Video games are cultural artefacts. It's impossible for us to play *Missile Command* in a buzzing American arcade with the threat of the Cold War looming, or to spin up *Tony Hawk's Pro Skater* in the shadow of late-nineties counter-culture. So as much we would like, we can never travel back, only forwards. And as we do, memories fade, and we lose our history – even while it's ever-more accurately emulated. 🕹

Contents



6

Attract mode

Interface

06. Super Meat Boy Forever

Team Meat give us the latest on their anticipated sequel

10. Mable and the Woods

A fantasy action-platformer with a pacifist twist

12. A Place for the Unwilling

Counting the days to a unique narrative adventure

16. Incoming

Aliens, Tokyo ghosts, and George R. R. Martin

18. Introversion Software

The Prison Architect studio's dramatic fall and rise

24. FUZ

A student's terrific PICO-8 tribute to the classic Fez

44. Couch co-op

The developers bringing a social edge to their video games

50. HAL Software

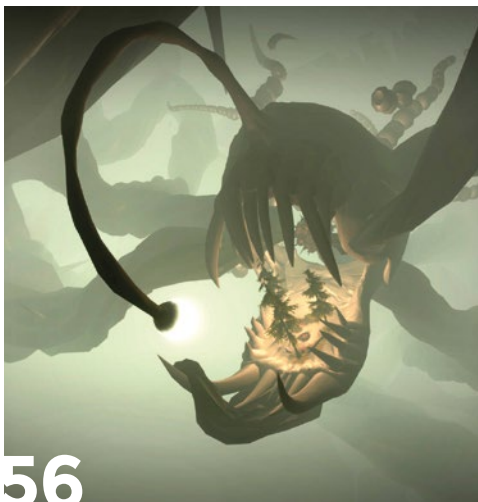
The minds behind Smash Bros. and Kirby profiled



18



50



56



44

Toolbox

- 28. Design Principles**
Why designers should aim for simple complexity
- 30. CityCraft**
Creating an imaginary fantasy city from scratch
- 32. Text as texture**
Using words to create atmospheric video games
- 38. Source Code**
Recreate the path-following critters from Lemmings

Rated

- 56. Outer Wilds**
Space-faring adventure rewards curiosity
- 60. Judgment**
Back to Kamurocho in Sega's new Yakuza spin-off
- 62. Mario Maker 2**
Nintendo's platformer construction kit levels up
- 64. Gato Roboto**
Pixel art Metroidvania is the cat's whiskers

WELCOME

Are there such things as positive and negative difficulty? That's a question I asked myself this week, as the announcement of the PC Engine mini sent me on a hunt through my collection of games for the original console. Browsing my dusty shelves, I eventually settled on *Tiger Road*, an action-platformer made by Victor Interactive in 1990.

Originally designed by Capcom's Tokuro Fujiwara – the genius behind the likes of *Commando* and *Resident Evil*, who we profiled back in issue seven – *Tiger Road's* similar to Fujiwara's own *Ghosts 'n Goblins*: it sends the player on a sprint from left to right, as enemies and projectiles hurtle in from all sides. But even compared to that legendarily tough classic, *Tiger Road's* a brutally difficult game – in fact, the PC Engine edition is even nastier than the arcade version, released three years earlier. Flying bats spawn unpredictably to knock you into spiked pits; other foes are capable of throwing projectiles from outside the bounds of the screen. Eventually, I became so frustrated by all the cheap deaths, and enemy attacks that inflicted seemingly random amounts of damage, that I took to simply dashing through stages without stopping to fight or grab any items.

This, I think, is the difference between positive and negative difficulty: positive difficulty challenges you to improve – to engage with a game's systems and master them. Negative difficulty is so punitive that you disengage from its systems and actively try to find ways to work around them. Or, in my case, quietly return the game to its home on a dusty shelf.

Ryan Lambie
Editor



INDIE GAME THE SEQUEL

After a long wait, *Super Meat Boy Forever* is almost here – and it's still as relevant as ever

It's been a nine-year wait, and to some, that feels like forever. But we're on the home stretch, and soon enough forever will instead feel like... well, *Super Meat Boy Forever*. The long-awaited sequel to one of the original (modern) indie darlings, Team Meat is continuing from where it left off: you have to navigate levels of ever-increasing, ever-more-punishing difficulty, and you have to die a lot. OK, maybe you don't *have* to, but you will.

With a fêted 7200 levels to play through, *Super Meat Boy Forever* is likely to keep a lot of folks playing... well, forever. But it's not just more of what we know – there have been tweaks in the past decade, the main one being the addition of a second action button. Yes, it's no longer a one-button romp through violent deaths and desperate success – it's now a two-button version of that, with things like jump attacks and slides added to Meat Boy and Bandage Girl's repertoire. If it were any other game hailing the addition of an extra button to its input layout after a nine-year wait, we'd be cynical. But this is *Super Meat Boy!*

It's been a long wait, but even after all this time Team Meat co-founder Tommy Refenes is still enthusiastic and confident about what *Super Meat Boy Forever* will bring to the table. We had a chat with him to find out what the new game's all about, the best way to avoid burnout, and just what it is that keeps him going.

How did *Super Meat Boy Forever* come to be? It's had a journey from mobile title to fully-fledged sequel.

In 2011, I prototyped a one-button *Meat Boy* game in my hotel room at GDC. I did this by making a *Meat Boy* character in the original game that would constantly run but could only jump and switch his running direction by jumping off a wall. I made a few levels that complemented this control scheme, and I found the game to be a lot of fun. In 2014 we spent about three months creating a prototype and showed it off at PAX 2014. At the time it was meant to be a much smaller game consisting of maybe three chapters and not much else. Shortly after PAX 2014, work came to a grinding halt until 2017. When I was able to work on the game again at the beginning of 2017, I once again saw that the game was a lot of fun and no-one had really done anything like it yet. So, I decided to go all out with

it and make this a massively huge game that exploits the hell out of the two-button control scheme, to make a *Meat Boy* game that feels like *Meat Boy* but can be played by pretty much anyone. Not only that, but I get to scratch my itch of 'I want to make movies', and I wrote a script for the story that has turned into about 40 minutes of fully animated cutscenes. It's about as close to a huge, massive triple-A game as you can get *without* abusing employees!

How has the experience of developing *Forever* differed from the original *Super Meat Boy*? What lessons learned first time around have helped here?

It has felt pretty much the same. When working on *Super Meat Boy*, I felt like I was working on the most important thing in the world. That feeling kept me going through the project and never once did I want to throw in the towel or give up. ➔

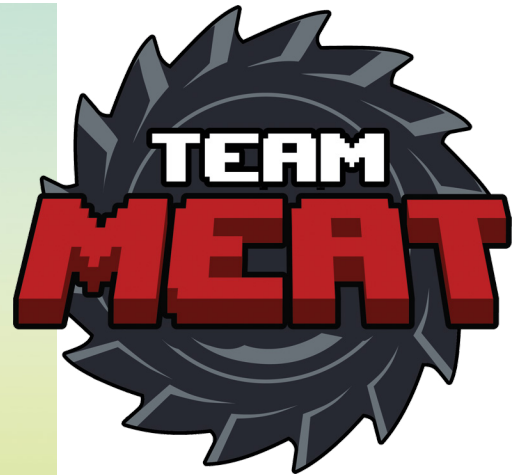
▼ You can guess how hard this is all going to be; it's the classic *Meat Boy* setup. Saws, mainly.







^ It's fair to look at a screen like this and cry 'literally impossible!'



feel natural, and you were never fighting controls to reach your goal. *Super Meat Boy Forever* does that exact same thing. Designing levels (especially bosses) that complement the two-button auto-running control scheme was a bit of an adjustment, but once we got it, we made a two-button *Meat Boy* game in every sense of the word.

There's a clear divide in the audience's expectations – some want more of the same, others more of the same-plus – how have you managed juggling these expectations?

I don't pay attention to it, and that's not out of disrespect to fans, but instead, I feel like I know exactly what I'm doing with this game. To worry about feedback from people who haven't played the game, who are just judging it based on two words, would be a disservice to both the fans and myself. I get the concern – I liken it back to when they cast Heath Ledger as the Joker. At the time I thought, 'What the... that dude?! Why didn't they do someone like Steve Carell – he's at least funny, and I bet he can be evil. This is going to suck!' and boy, was I wrong. There are people who will not like *Super Meat Boy Forever*, but I honestly feel it will have a bigger audience than the first one, and the huge majority of existing fans will love it. I base this on what I've seen at public showings. I can't tell you how many times I've heard 'I heard it was an auto-runner and was sceptical, but this is amazing'. I have a rule, though, that I never read comments or articles that are written about me or the game. Keeps me sane. I highly recommend it.

With *Forever*, the team is much larger, but I feel like each person I'm working with adds to that energy. My lead level designer Kyle and my additional designers Ryan and Daniel surprise me constantly with the levels they are putting out. My lead artist Lala just makes amazing stuff appear out of thin air somehow. My lead animator Paul, along with all the additional animators, are cranking away on the script I wrote, and are making kind of a fully-fledged *Super Meat Boy* movie to go along with the game. Every day I see progress, and every day I think 'Wow...this is pretty awesome'. I still have those doubts that everyone has of, 'Oh... is this going to be good? Am I overthinking this?', but it's a joy to work on each day. Lessons from the first time around were: get a lawyer, and: read contracts. I've done both, and so far everything is going great!

Is there a pressure to perform this time around, that maybe wasn't there before?

Not really. Obviously, I want the game to succeed, but there isn't a scenario where the game isn't profitable unless people just stop buying games altogether... like, if we have a war or something. But in that case, the world is kind of [screwed] anyway so it doesn't matter then if the game is doing well or not.

Similarly, there's an expectation for *Forever* to be a hard game, something you have to 'git gud' in. What are the unique challenges in making something uniquely challenging?

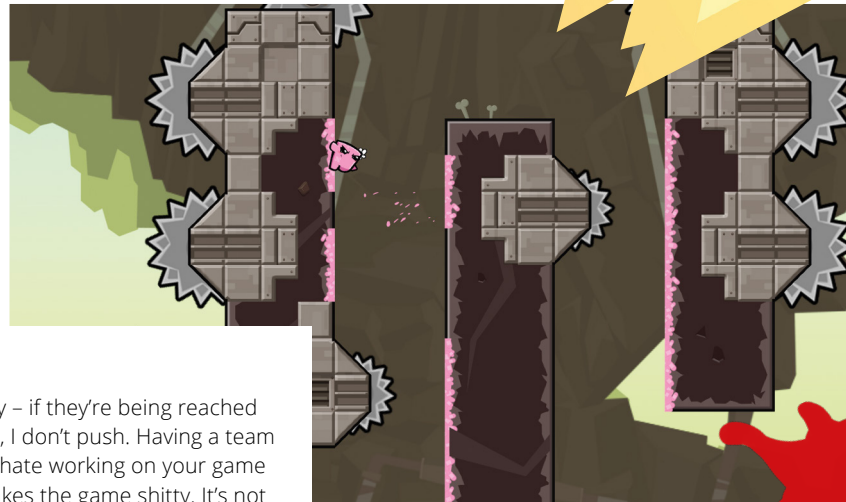
A *Meat Boy* game isn't a *Meat Boy* game if it isn't hard and if you can't get good at it. In the first game, the challenge came in making brutally difficult levels that felt fair. No-one ever says, 'What the hell, why did I die?' when playing *Super Meat Boy*. The design philosophy of 'hard by fair' is pretty easy to follow when you simplify it down. *Super Meat Boy* worked because the level design and the controls complemented each other. You were never asked to do something that didn't

"I 100% believe it will succeed. The world may have changed, but people still want to play good games"





Meat Boy's moveset is now based on two-button inputs.



How's the 7200 levels figure been reached? Handcrafted, but combined dynamically – how did you go about putting this together?

Each level is legit... meaning each one is being designed, tested, decorated, and polished. Those get smashed together to make one long level. It is a *ton* of work that's being tackled by three level designers right now.

You've made a point to say you're working at a 'healthy, sustainable pace'. How key is this factor? How do you make sure you're not burning yourself or the team out over such an extended period?

Burnout comes from overwork, not from extended work. Personally, I don't get burned out. I imagine this is due to the fact that I have to keep my body healthy due to having type 1 diabetes, so that means I have to eat right, and I have to exercise. A side effect of doing both of those things is that my mind stays healthy and allows me to work long hours. It also helps that this is all my brainchild, and every part of this game I have touched in some way, so in a way, I have so much to do that it never gets boring. As for the team, I give tasks but rarely do I give deadlines. I make sure goals are being reached; if they aren't,

I figure out why – if they're being reached at a good pace, I don't push. Having a team of people that hate working on your game or with you makes the game shitty. It's not in my best interest to do this, so I don't. How well I treat the team will reflect in how well they do their jobs.

Are there any tips and tricks you can offer other indies out there? Especially those working on years-long development cycles of passion projects, say?

Don't quit your day job. There is a very good chance you will fail multiple times before you succeed. Do not overextend yourself, don't go mortgaging your house and stuff to make your passion project. Work at a healthy pace. Watch what you eat, exercise, and keep yourself healthy, because you can't finish your job if you're dead. I know I say all this and in *Indie Game: The Movie* I looked pretty unhealthy, and truth be told, I was. But that was also a month before the game came out, not the entire development cycle. I relied heavily on my family to keep me healthy, and they did. Take help where you can get it, and don't be afraid to ask for help when you need it. If you do succeed, don't spend your money like an idiot. Plan on your money running out at some point, and invest wisely.

way James and Lianne put it together is what made that movie impactful, and I feel like that is timeless. The indie scene has changed by becoming much bigger than it was in 2010. For better or worse, anyone can make a game now, and it has expanded the market. I feel it's harder to get noticed since there are so many games coming out every day, but I also completely believe that good games succeed. No matter how big the market gets, people will still want to be entertained. Games that cannot do that fall by the wayside. Same with movies, same with books, same with music.

It's been nine years since the first game – can it succeed in a world that's changed so much since the first game?

I 100% believe it will succeed. The world may have changed, but people still want to play good games and be entertained. *Super Meat Boy Forever* is a good and entertaining game with a very large fan base. I don't feel like it will be a struggle to find success, even after nine years.

Finally, and I think this will be the last time I ask it because it's not funny anymore: are you doing a Battle Royale mode? We suggest it be called 'Teams Meat'.

100 Dr. Fetuses are dropped on an island... 🤡

Super Meat Boy Forever releases for PC, PS4, Switch, and Xbox One soon.

How has the indie scene changed since the original SMB? Indie Game: The Movie doesn't feel like it'd be such an impactful documentary if it were released these days, from my perspective.

I disagree. I think the movie would be as impactful because it's a movie about people, not about video games. The human element of the movie and the





Mable And The Wood

▲ It's clear that a lot of thought has gone into the foreground and background designs to give the game depth.

How do you save the world if you can't even lift your sword?
Developer **Andrew Stewart** gives us the lowdown

Info

GENRE
Metroidvania

FORMAT
PC / Mac / Linux /
Switch / Xbox

DEVELOPER
Triplevision Games

PUBLISHER
Graffiti Games

RELEASE
Summer 2019

Sometime during the mid-eighties in the outskirts of Sheffield, a young boy spent half his childhood playing video games and the other half tearing through the woods.

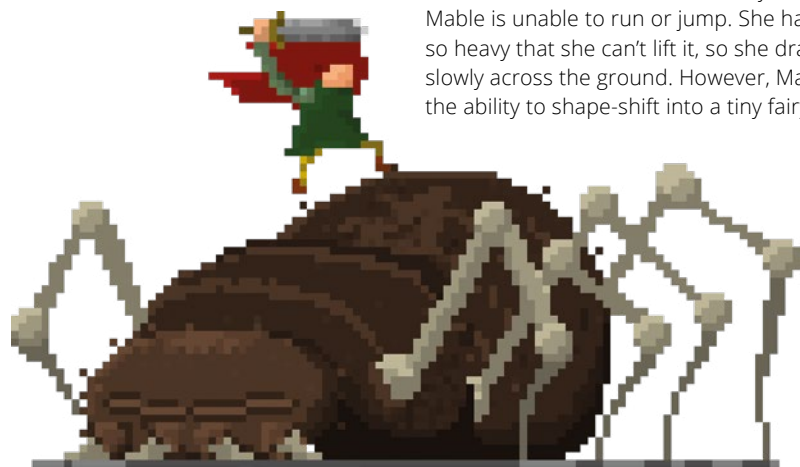
He went on to make text adventures on the ZX Spectrum with his sister, and as a teen, to experiment with game development using the Microsoft XNA and Flash. In April 2015, he took part in the Ludum Dare game jam; the theme was 'An Unconventional Weapon'. His entry, *Mable: The Journey*, would go on to place 26th out of 2821 games. Developer Andrew Stewart had come a long way from the woods of High Green, but it was only the start of his four-year journey to bring *Mable And The Wood* to fruition in GameMaker.

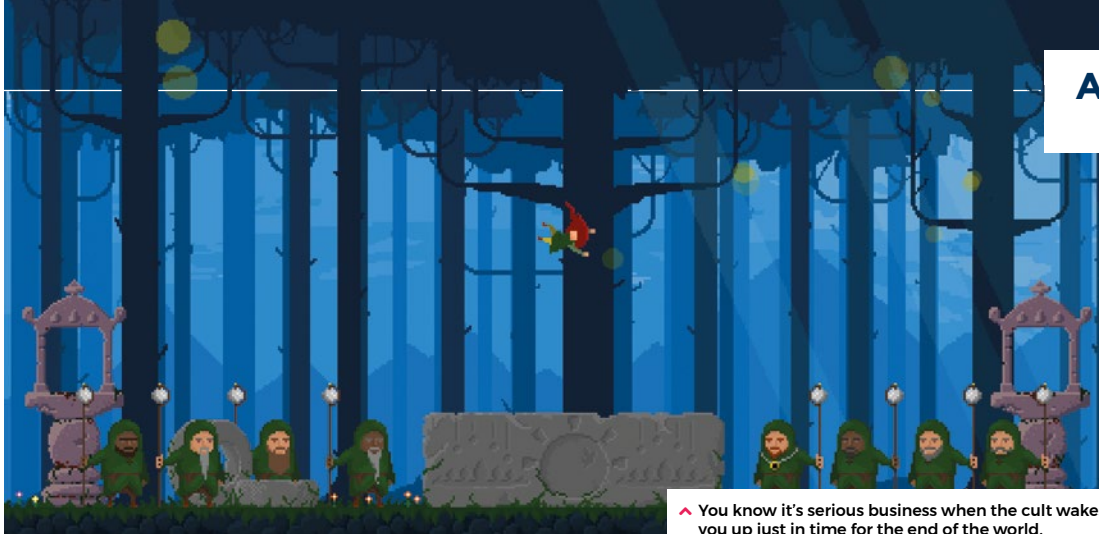
Mable And The Wood is not your typical Metroidvania. The titular and newly resurrected Mable is unable to run or jump. She has a sword so heavy that she can't lift it, so she drags it slowly across the ground. However, Mable has the ability to shape-shift into a tiny fairy, and as

she flies onwards, she will inevitably drop her sword. When she recalls the sword to her hand, she resumes the form of a young girl, while the sword eliminates anything in its path. Mable also has the ability to take on the form of any bosses that she kills, which then changes the player's navigation of the world, and paves the way for different endings. These forms grant Mable new powers such as the ability to sneak past enemies, turn them into stone, or even smash through them.

Interestingly, the game can be completed without bloodshed. Numerous power-ups and secret abilities are hidden throughout the game, which gives you the opportunity to carve a non-violent path through the world. However, a peaceful solution is unlikely to be relatively painless; the world is populated with numerous unfriendly inhabitants. Even if you pick up the controls rapidly, Mable will have to do plenty of careful shape-shifting and dodging if you want to avoid any conflict. Bear in mind that the cult that resurrects Mable believes in an ancient prophecy that says she will hunt down great beasts, take their shape and save the dying world. But the prophecy is so very old, and its meaning may have become garbled over time – what if the cult is wrong? How will Mable save the world? More pressingly after the game jam in 2015, however, how would Stewart's game development journey continue?

In early 2016, Stewart ran a successful Kickstarter campaign to raise funds to commission an original soundtrack for the game, and purchase additional art and equipment.





^ You know it's serious business when the cult wakes you up just in time for the end of the world.

He continued to work on the game in his free time and was grateful for the support of his Kickstarter backers. That support helped him to get through family tragedies, a broken computer, and stressful periods. "My wife Sarah's support during development has been absolutely vital, and without it, I wouldn't have been able to work on the game at all," Stewart says. "I need to get the game finished soon though, or she'll have forgotten who I am!"

Stewart's typical work day varies depending on what he's working on. "For example, when I'm designing the sprites, even though it's pixel art, I always start with pencil and paper. I try and think about what would be a unique visual motif for this sprite and then sketch my ideas around that," he says. *Mable And The Wood* may initially

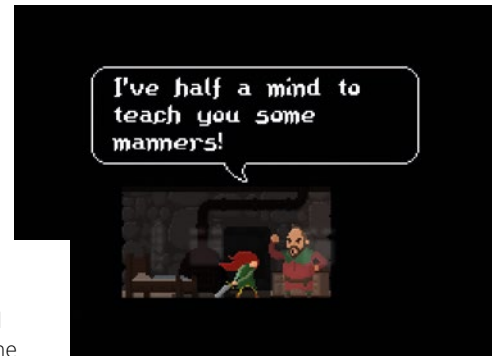
seem quite simple and stark with its pixel art and bright colours, but the layered backgrounds give a surprising depth to the game's 2D plane.

For a long time though, the biggest challenge was simply getting the work done. As we saw in Wireframe issue 13's look at life as a solo developer, making an indie game is no mean feat, and requires an incredible amount of perseverance. "I'd get home from work, get the kids in bed, and only then start working on the game," Stewart recalls. "I'd try and get in two hours a night, but for a while, the kids were waking up several times a night, so I was getting three to four hours of broken sleep a night for weeks on end. That was tough."

Stewart met all of his collaborators through the TIGSource forums, with the exception of Maarten Boot, who was recommended by a friend. "I worked with Chris Early during the



^ Neither snow nor rain nor heat nor gloom stops this heroine from saving the world.



^ Part of what makes the game so likeable is the unexpected dialogue from residents. Turns out, not everyone likes magic.

"We're trying to get a SNES RPG feel to it, reminiscent of *Secret of Mana*"

Kickstarter, and he helped with the fonts and typography while Maarten Boot worked on the world map art," he explains. "Swonqi is a great pixel artist, and I basically just message him on Twitter whenever I'm not happy with the pixel art

I've done for something. For example, I did about seven or eight different versions of the puff of smoke that appears when you kill an enemy,

and I was unhappy with them all. Swonqi took maybe half an hour to come back with the perfect animation.

"And I did a game jam with Fat Bard Music a while back, and the music was awesome, so I knew that I wanted to work on *Mable And The Wood* with them. We're trying to get a SNES RPG feel to it, reminiscent of *Secret of Mana* or *Chrono Trigger*. I want it to be the kind of soundtrack that you can enjoy on its own."

As the release date draws closer, though, Stewart says he feels a growing excitement at the thought of people finally getting their hands on *Mable And The Wood*. "I'm really excited to see how everyone reacts to the game, and to see which of the secrets they find," he says. "I've hidden quite a bit in there. And a few things are very well hidden." 🗝

^ Vanquish a foe and you can take on its form and gain an additional unique ability.



LOOKING BACK

Of the final hours of the Kickstarter campaign, Stewart recalls, "It was over the target, and there was me and a few of the backers just online chatting and watching it count down. It felt so good that there were other people who wanted the game to be made!" Showcasing the game at EGX also proved to be an incredible experience for him. "Just seeing how much people really loved the game blew my mind," he says. "It was the same again at Rezzed, and I got to meet some backers, which was awesome!"



Majora's Skies



A Place for the Unwilling looks to some superstar influences

Info

- GENRE**
Narrative adventure
- FORMAT**
PC
- DEVELOPER**
AlPixel Games
- PUBLISHER**
AlPixel Games
- RELEASE**
July 2019

“W

e'd never say *A Place for the Unwilling* is on par with them, they're both timeless classics, but we do aspire to craft an experience that

feels as unique as playing those two felt to us.” It's a fair point from AlPixel Games, speaking about its upcoming narrative adventure, but when you're using both *The Legend of Zelda: Majora's Mask* and *Sunless Skies* as reference points for your game, there are going to be some understandably raised expectations.

“When we use *Majora's Mask* and *Sunless Sea* to talk about our game, it's mostly because we've always struggled to describe the experience to others,” the studio tells us, pointing out that *A Place for the Unwilling's* closest analogue is actually something like Ice-Pick Lodge's 2004 psychological horror title, *Pathologic*. “When you pitch the project in a show and mention the

word adventure they ask if it's a point-and-click game, then you have to explain that it's an open world and there are no puzzles. A few minutes later, somebody else asks if it's a visual novel and you show them it's actually a game where you're free to explore a big city. Then another person watches you trading goods and thinks it's a trading game. See where this is going?”

But it's the story that's core to *Unwilling's* experience, even with all the comparisons and similarities being thrown about, it's this specific game's focus, and it is its own tale to tell. Set in a dying city's final 21 days, the game follows a branching narrative path for the player, who takes on the role of a trader living in the city. What do they do? Well, whatever the player wants, really. Time passes, however you choose to spend it, and people go about their days – you might just walk around the park, or trade some goods, or maybe visit an old friend to pass the time before the end.

Whatever you do, it's all your choice and – importantly – it's all your story. “We have many different story arcs, and there are plenty of breadcrumbs around,” AlPixel explains. “But players are free to set their own goals in the city. That's the core of the game, creating a story that is different from the rest. When you talk about your experience with a friend it won't just be about if they killed that one guy or spared him.”

A Place for the Unwilling is being made using Unity along with Ink, Inkle's narrative scripting language, most recently seen in the excellent *Heaven's Vault*. “[Using Ink] is key in a tiny team such as ours, where you can't just nag the only programmer in the room for every new detail

▼ Aw geez, it's the fuzz.



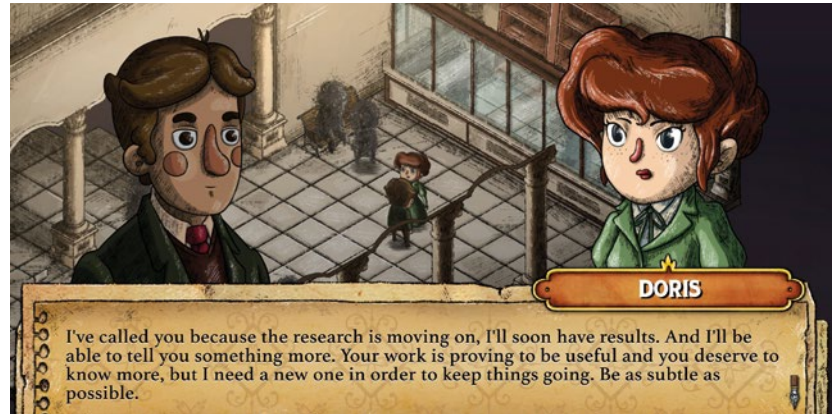
you want to change in a dialogue," AlPixel says. "Not every game out there needs Ink, but it's the most powerful and elegant narrative engine open to everyone. They released it a few months after our development began and it changed everything. *A Place for the Unwilling* would be very different without it. It has enabled us to do all sorts of things that are almost impossible for a small studio."

Being a small studio made up of relative newcomers to the industry, AlPixel has also used *A Place for the Unwilling* as a solid learning experience, admitting it has made mistakes along the way – but acknowledging this has all been for the best, ultimately. "One of the most meaningful decisions we've taken during development has been paying more attention to healthy working conditions," the studio says. "It's not like we crunched a lot before, but we'd do things like going to a show on the weekend, spend two full days taking care of the booth, get home completely exhausted, and then go back to the office on Monday morning. We understand everyone gives their very best when they feel well, and it's important to pursue that. At one point, we started focusing even more on this. Asking others how they are doing, reminding them to take a break if they're working late, being more careful with deadlines, trying to be flexible with specific cases, and so on."

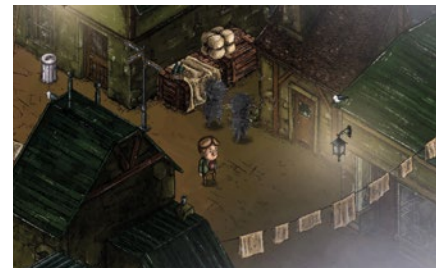
"Prepare for the worst, expect the best, take what comes"

"Above all the things that we've learned during development, that still is the most important one. We all want to make great games, but we don't want to destroy the people that build them in the process."

It might not be specifically aiming to be the new *Majora's Mask* or *Sunless Skies*, but *A Place for the Unwilling* has been getting people excited. It could be great. If it is, it'll hopefully be a big success for the small studio in Spain. But how to prepare for launch? "Prepare for the worst, expect the best, take what comes," AlPixel suggests as a motto for the team. "Everyone at the studio is in a stable position, we are paying bills, and have some savings. There's not much else we can say – it's mostly a matter of working as hard as possible until release and hoping we took enough right decisions. We are proud of what we've built and can't wait for people to explore the world we've spent so much time creating." 🗨

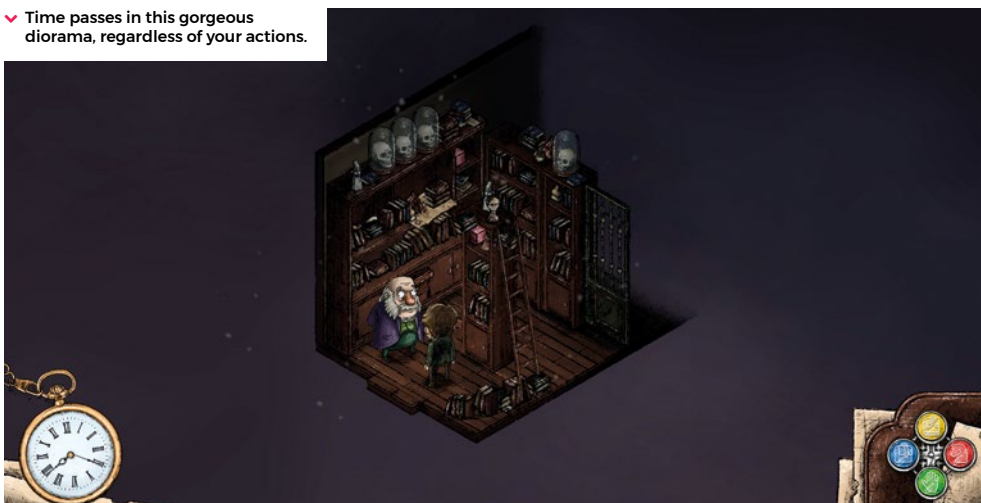


▲ Using Ink means the story – and dialogue – is branching.



▲ There's a hint of eighties isometric adventures on the Speccy here.

▼ Time passes in this gorgeous diorama, regardless of your actions.

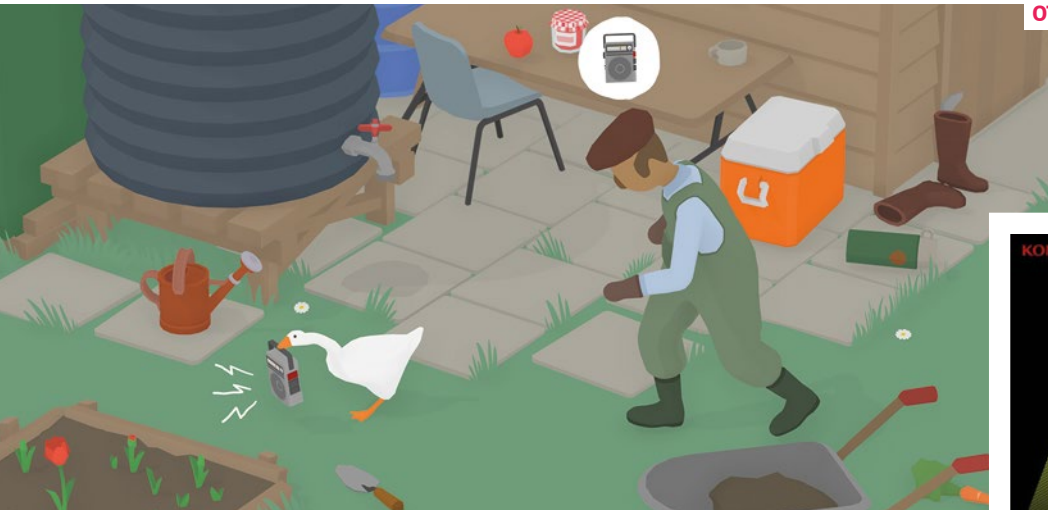


KICKSTARTING CHAOS

A Place for the Unwilling was part-funded via a Kickstarter campaign, but the game's original publisher ran into some problems and – long story short – AlPixel has had to do a lot of work picking up the pieces. "We still intend to keep our promises and we post messages everywhere, encouraging backers to get in touch with us," the studio says. "It's a time-consuming task for a team that is already overwhelmed, but we are going to send the rewards to every person that gets in touch with us. We always try to be open and accessible on social media, email, and Discord. Most backers have already talked to us and will receive their rewards soon. We will continue trying to reach the others."

Headlines

from the virtual front



01. Epic Gander

It's a telling situation we're in, where game developers (and publishers) exercising their rights to a) be paid more, and b) sell their games where they want is met by a deafening roar of betrayal. But hey, that Epic Games Store, right? What monsters they are, et cetera and so on.

One developer, though, has opted to push back – politely – in the shape of House House, creator of the upcoming *Untitled Goose Game*. The studio posted a tweet after announcing its game would be an Epic exclusive on PC – at least for a while – clarifying the decision: “House House is a small independent studio that has been operating on a tight budget for years,” it wrote, “so a partnership like this gives us a means to make games sustainably for the foreseeable future – in an industry like ours, this kind of stability is huge.” Bills do have to be paid.

02. Quiet Riot

Riot Games has come under increased scrutiny after the California Department of Fair Employment and Housing (DFEH) filed an enforcement action, compelling the studio to provide the agency with pay information for its employees. This comes as part of an investigation into alleged gender discrimination at the *League of Legends* developer and, according to the DFEH, Riot has not been playing ball.

The agency – which enforces California's civil rights laws – moved to the enforcement action after it claimed Riot had not provided any details of employee pay, which needs to be analysed for the investigation to continue.

In a response to the DFEH's filing, Riot Games says it has been cooperating with the state agency and is ‘disappointed’ the enforcement action has been pursued.



03. Turbo time

The resurgence of Konami as a studio that actually does things in the world of video games continues, with mini versions of its... well, of NEC/Hudson's TurboGrafx/PC Engine announced. The 8-bit machine masquerading as a 16-bit console will be available in three flavours worldwide, with Europe getting the PC Engine Core Grafx Mini, Japan the PC Engine Mini, and the States the TurboGrafx-16 Mini. Seems Europe drew the short straw for naming.

The full range of games wasn't revealed at the time of writing, but we can expect *R-Type*, *New Adventure Island*, *Ninja Spirit*, *Ys Book I & II*, *Dungeon Explorer*, and *Alien Crush*. And you can expect them because they've been confirmed. Price and launch date, however, have not been confirmed.



Ukie public vote crowns
LittleBigPlanet best British game

EA says loot boxes are ‘surprise mechanics’, ‘akin to Kinder Eggs’



04

04. Unity

Two sides of the game developer unionisation argument here, as prominent figures in the world of both gaming and grown-up politics have stuck their oar in. Bernie Sanders, US senator and lifelong civil rights activist, tweeted out: "The video game industry made \$43 billion in revenue last year. The workers responsible for that profit deserve to collectively bargain as part of a union."

That flip side came in the form of Strauss Zelnick, Take-Two CEO and lifelong 'we have no idea if he's a civil rights activist' person, who commented on the increasingly present unionisation discussions. Speaking to **GamesIndustry.biz**, the CEO said unionisation typically comes about owing to lacking labour relations, and low job availability/pay – the Take-Two CEO argued none of these aspects apply in his company, adding: "It's hard to imagine what would motivate that crew to unionise."

Zelnick did strike a diplomatic note though, saying: "If our colleagues want to engage in collective bargaining, then we will." wfmag.cc/Unite



05

05. Lumber support

We don't want to cast aspersions, but the decision to announce significant layoffs at Amazon Game Studios during E3 – when the (news) Eye of Sauron would be pointed elsewhere – strikes us as a particularly sneaky one. Dozens of employees were given 60 days to find new roles within the wider Amazon umbrella, or to receive redundancy pay after that timeframe, with some unannounced projects also cancelled, according to Kotaku.

Meanwhile, developers at AGS have, in part, put the blame for the studio's lack of finished titles (only two have been released) firmly at the feet of its proprietary engine, Amazon Lumberyard. It's like "driving a train while the tracks are still being laid," one anonymous dev told the Wall Street Journal.



06

06. Next-gen doubt

PlatinumGames' Atsushi Inaba has thrown his own brand of cold water on the next generation of consoles, saying they're 'OK'. Speaking to Video Games Chronicle, the head producer said: "I'm sure that things will move faster, graphics will be better, and maybe it will be easier with less wait times... that's good for the consumer. But it's more of the same, quite frankly, compared to previous generations. It's nothing that's disruptive or super innovative, if you ask me."

Far from being a killjoy, though, Inaba explained what it is he *does* find exciting – and it makes us think maybe *Bayonetta 4* and *Vanquish 2* will be coming to Google Stadia: "For me, things like cloud platforms represent innovation and something very, very different," he said. "They're platforms that excite me and where I feel there is a lot more innovation happening."

Ninja announces book; Booker Prize committee alerted



Bluepoint co-founder Andy O'Neill passes away, aged 47

Preview



Carrion ↗

Here's a game that gives players the chance to explore the darker side of their nature. In *Carrion*, you control a deadly, shape-shifting alien that likes nothing more than to roam 2D levels, gorily dispatching puny humans. The debut from Phobia Game Studio, this one looks grim, bloody, and hugely entertaining.

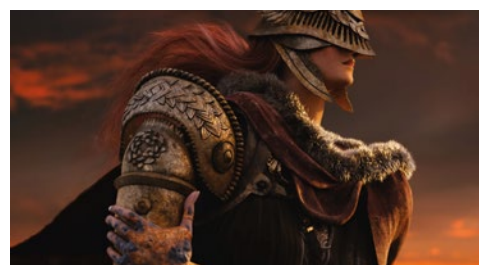


Spiritfarer ↗

Keep a box of tissues handy for this potential tear-jerker: you play a ferry master whose job is to bear the souls of dead animals across the sea to the afterlife. Along the way, you customise your boat and see to your furry friends' needs before dispatching them to the great beyond. The premise alone is a bold one; throw in its studio's track record – Thunder Lotus Games previously brought us *Jotun* and *Sundered* – and we have a potential gem in the making.

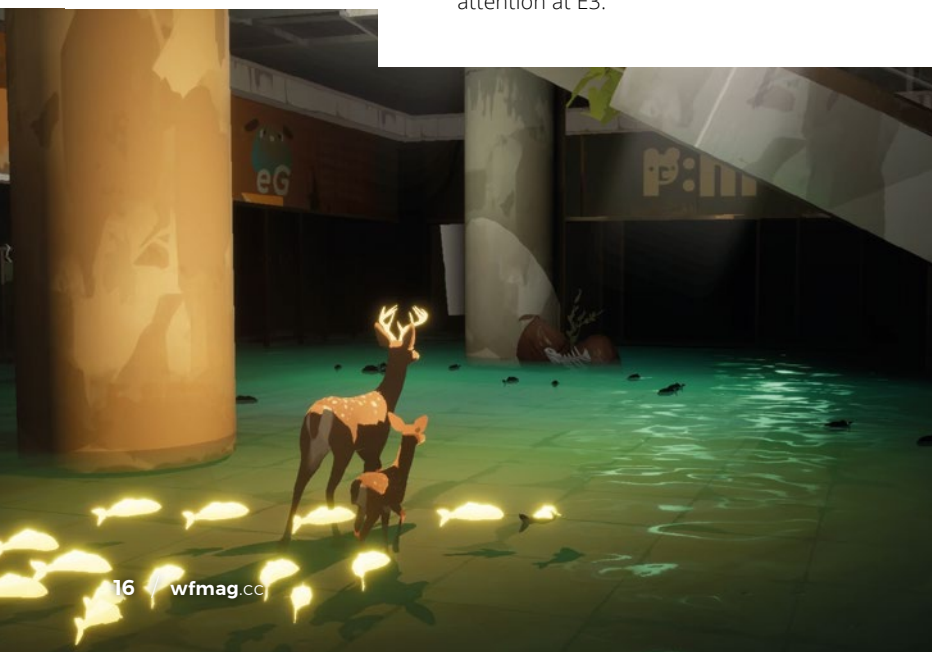
Way To The Woods ↘

Australian artist and game designer Anthony Tan was just 16 years old when he began work on *Way To The Woods* in 2015, which, given just how spectacular it looks, makes us feel a bit inadequate if we're being honest. At any rate, Tan's years of hard work are beginning to bear fruit: having been picked up by publisher Team 17, the game – a gentle adventure about a pair of deer searching for a way back to their woodland home – garnered some deserved attention at E3.



Elden Ring ↗

Like a 1970s supergroup, *Elden Ring* brings together disparate creative talents to create something new and, we hope, brilliant. In this instance, *Dark Souls* director Hidetaka Miyazaki's joining forces with *A Song of Ice and Fire* author George R.R. Martin to craft an open-world fantasy game. We don't know much more about *Elden Ring* right now, but based on Miyazaki and Martin's previous output, we aren't expecting sunshine and rainbows.





GhostWire: Tokyo ↗

Billed by *Resident Evil* director Shinji Mikami as an “action-adventure game in which you’ll fight paranormal enemies,” *Ghostwire: Tokyo* looks like a natural progression from Tango Gameworks’ earlier *Evil Within* series: it’s a horror opus expanded to take in an entire city. If we’re interpreting the announcement trailer correctly, most of the residents of Tokyo have vanished, leaving the megalopolis in the grip of a demonic horde; meanwhile, we’ll be controlling a hooded character armed with a spectral bow and arrow. That demonic horde will, we’d wager, be susceptible to the odd magic arrow in the eye or burst of supernatural energy from the protagonist’s hand. Further details are thin on the ground, but if the game’s another hit for Mikami and creative director Ikumi Nakamura, we’re hoping to see a whole series of these games set in other cities around the world. *Ghostwire: Norwich*, anyone?

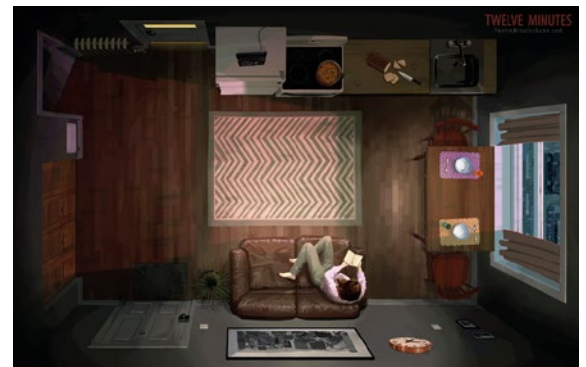
The Outer Worlds ↘

The *Fallout* series may have suffered a bit of a wobble recently thanks to a certain online outing, but we get a distinct impression that the franchise’s rich storytelling is alive and well in Obsidian’s *The Outer Worlds*. It is, after all, directed by Tim Cain And Leonard Boyarsky, two developers who played a key role in making the original *Fallout* back in the nineties. A first-person RPG set in a future where corporations already control a swathe of colonised planets across the galaxy, *The Outer Worlds* mixes expert world-building and biting satire.



12 Minutes ↘

An interactive thriller with the time-loop conceit of *Groundhog Day* and the top-down perspective of Hitchcock’s *Rope*, *12 Minutes* is a uniquely unsettling game from a former developer at Rockstar. Within the confines of a dingy apartment, you have to relive the protagonist’s final moments over and again, as you try to figure out why a crooked cop has barged in and beaten you to death. Like we said: unsettling.



BREAKING OUT

When **Introversion** began to feel shackled by *Prison Architect*, it decided to break free. But what will freedom bring for the acclaimed developer?

WRITTEN BY
David Crookes

▼ *Darwinia* won three prizes at the Independent Game Festival Awards in 2006.



There are four directors running Introversion Software, the developer that once promoted itself as the last of the bedroom coders. But of Mark Morris, Chris Delay, John Knottenbelt, and Thomas Arundel – the talent that helped to bring acclaimed games such as *Uplink*, *Darwinia* and *DEFCON* to life – one stands out as being particularly special.

“If Tom or Johnny came along one day and said, ‘Look guys, I’ve got to go’, it wouldn’t be the end of the world,” says Morris, with endearing honesty. “But if it ever happens that Chris stops making games, then that will be it for the business.” Thankfully for Introversion, there appears to be little danger of that happening.

Delay loves making games and, today, Introversion is in an enviable position. It recently sold the IP for *Prison Architect* – the studio’s most successful game to date – to Swedish publisher Paradox Interactive, and it’s rather ironic that

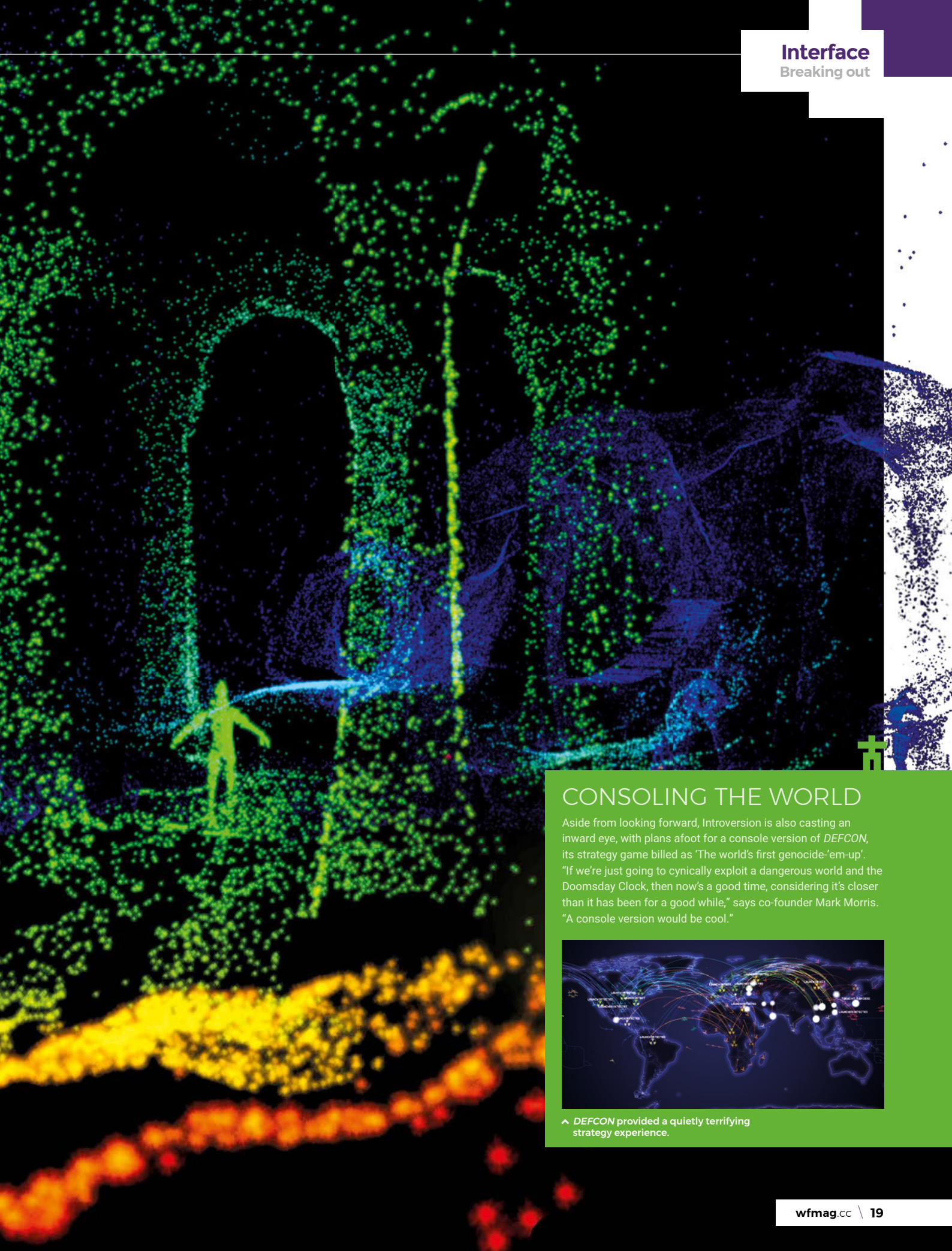
a title which allows players to construct and maintain a maximum security jail has given them so much freedom.

Gone are the shackles of working on a game for so many years; *Prison Architect* was first announced in October 2011, and released as a crowdfunded alpha pre-order in 2012. Banished too are the outside pressures of video game development. After all, the game topped \$28 million in sales within a few years – more than enough to buy time for a developer as tight-knit as Introversion.

“When we released *Prison Architect*, we kind of hit the jackpot, really, because it sold – and continued to sell – in mad numbers,” Morris says. “We kept thinking that the rate of sale was going to slow down, but it didn’t.” Sales in excess of two million tell their own story.

A full release in 2015 saw *Prison Architect* achieve rave reviews, and it won the Best Persistent Game category at the 12th British ▶





CONSOLING THE WORLD

Aside from looking forward, Introversion is also casting an inward eye, with plans afoot for a console version of *DEFCON*, its strategy game billed as 'The world's first genocide-'em-up'. "If we're just going to cynically exploit a dangerous world and the Doomsday Clock, then now's a good time, considering it's closer than it has been for a good while," says co-founder Mark Morris. "A console version would be cool."



^ *DEFCON* provided a quietly terrifying strategy experience.



▲ *Prison Architect* has appeared on many platforms including Xbox One, PS4, and more recently, Nintendo Switch.



▲ Campaigns in *Prison Architect* use Polaroid photos to tell their story.

Academy Game Awards in 2016, awarded by BAFTA. “We’re now just having a bit of fun and waiting for a seed of an idea to come along,” Morris says of the current plan. “There’s no pressure, no need to get an alpha out by September, and we’re enjoying the freedom.”

BUILDING UP

There’s a sense that the decision to hand over responsibility for *Prison Architect* wasn’t an easy one, given that Introversion is made up of a small team which, aside from the directors, also includes a handful of programmers. Introversion, more than most, knows what it’s like to hit rock bottom. It was close to going bust in 2010 and, although there’s little chance of that happening again anytime soon, ridding themselves of such a profitable game will always have inherent dangers.

Even so, Introversion is confident that it’s made the right decision. “With *Prison Architect*, we found ourselves having an amazing game and an incredible audience, but also a company that was starting to drift in a direction we didn’t really want to take it in,” Morris explains. “We had

▼ On promotional duties for 2006’s *DEFCON*.



STANDING OUT

Despite the rise of software like Unity and Blender, Introversion believes it’s still as difficult to make a new, attention-grabbing game today as it was back when the studio began. “It might be easy to produce something thanks to technology such as Unity, but it’s hard to create a game that’s good,” says co-founder Mark Morris. “So while people can make 3D worlds far easier than they could back in 2001, the likes of Unity produce similar results and lay down a particular set of constraints. You get to a point where you have a feeling for how a game might be, and a sense in the back of your mind that you’ve played something similar before.”

loads of conversations about whether we should continue to be ‘the *Prison Architect* guys’ and whether we should make another *Prison Architect* game and maybe keep going with it until the end of time. But we felt that wasn’t what we wanted to do as a team, and we wanted to unshackle ourselves from this cash cow.”

How much Introversion made from the sale to Paradox Interactive hasn’t been disclosed, but the impact felt by the developer is, Morris argues, worth more than money alone. It’s allowed Delay to remain motivated and eager to pursue new gaming avenues, while ensuring *Prison Architect* will continue to be enjoyed by fans for some time to come. “We started to think this could be a match made in heaven, because we can step away and work on new concepts, and *Prison Architect* isn’t left to rot,” Morris says.

Indeed, Introversion believes there’s still a lot more that can be put into the title; they just didn’t want to be the ones to do it. Paradox certainly has experience. Along with Tag Games, it successfully ported the game to mobile

devices (while Double Eleven created versions for consoles).

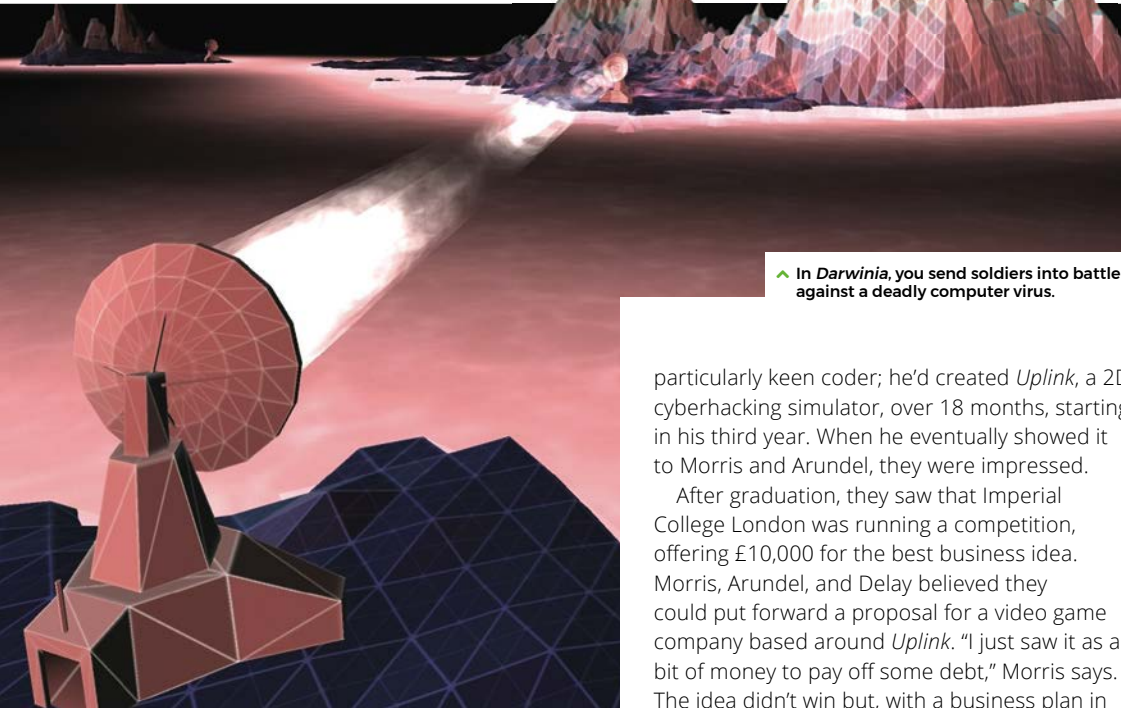
“It’s hopefully in safe hands,” Morris adds.

“Paradox has a strong

track record in keeping games alive for a long time, and nurturing and building communities, so for us, it was a really exciting move – although it was stressful, too.”

DOING TIME

But what of the titles to come, and what has Introversion learned from the past? Most recently, in 2017, it released a first-person exploration game called *Scanner Sombre* which had players assuming the role of a cave explorer. It was critically well-received, with



▲ In *Darwinia*, you send soldiers into battle against a deadly computer virus.

reviewers enjoying the concept of players using an in-game LIDAR scanner to scan the environment and build the world around them. Having to douse the walls with colourful dots took Introversion down an artistic and atmospheric path that could be frightening and mesmerising in equal measure. Unfortunately, *Scanner Sombre* didn't fare too well in terms of sales.

"When we developed *Scanner Sombre*, I think we made some mistakes, and I think those mistakes were down to knowing that, at any point, we could step back and start working on *Prison Architect* again," Morris explains. "This wasn't especially helpful for *Scanner Sombre's* success, and we felt that *Prison Architect* was preventing us from exploring new ideas. My biggest fear has always been that Introversion would never release another title, and it keeps me up at night. But that, in part, was what I was worried *Prison Architect* might do to us."

The strategy now is to take stock and look to Introversion's strength: the elements which have ensured the company has been able to weather the storm of a changing video game market for the best part of two decades. For that, it's worth returning to the late 1990s, when the four directors were students at Imperial College London. Three of them were on the Computer Science course, and Arundel was reading Electrical Engineering. Delay, however, was a

particularly keen coder; he'd created *Uplink*, a 2D cyberhacking simulator, over 18 months, starting in his third year. When he eventually showed it to Morris and Arundel, they were impressed.

After graduation, they saw that Imperial College London was running a competition, offering £10,000 for the best business idea. Morris, Arundel, and Delay believed they could put forward a proposal for a video game company based around *Uplink*. "I just saw it as a bit of money to pay off some debt," Morris says. The idea didn't win but, with a business plan in place (and with Knottenbelt assisting with some tricky technical issues with the game), a decision was made to go one step further and try to sell *Uplink* to the public.

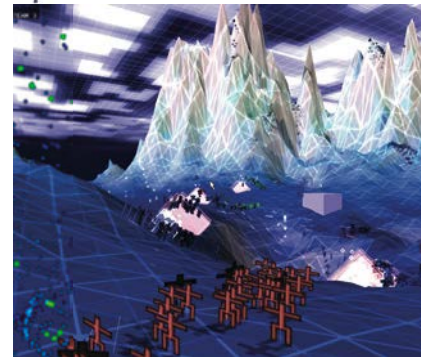
TURNING PRO

The young developers first attempted to release *Uplink* themselves, putting up £600 between them to buy compact discs from a CD plant, produce packaging, and tout the game around the British press.

As Delay explains in a blog post on the Introversion website, a homemade copy landed on the desk of Kieron Gillen, a journalist for PC Gamer who, fatefully, decided to play it. "If you believe the legend, Kieron also handed the disk around the PC Gamer office and told everyone else to play it," Delay says. Gillen awarded the game 80 percent.

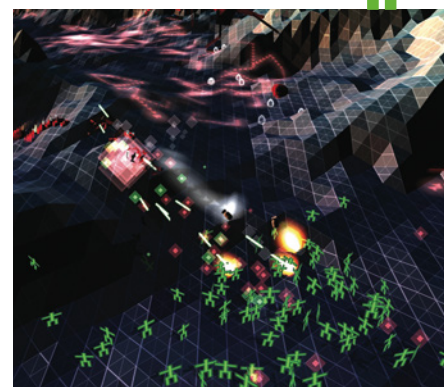
Suddenly, interest in *Uplink* boomed, and it led to a distribution deal with the publisher Pinnacle, which got the game into shops. Now that the venture was turning professional, Introversion Software was incorporated in January 2002 and, as sales boomed, Delay turned his attention to another game, *Darwinia*, that would take three years to make.

"Chris proved very early on that he had a very artistic side to him, and that artistic and creative exploration is what we saw in *Darwinia*," Morris says. "It was very different to *Uplink*, which was a strongly themed simulation game, and it was the start of Introversion creating two separate ➤



▲ *Darwinia* sold 40,000 copies – a respectable figure for an indie developer.

▼ *Darwinia* was made to look retro, in part because Introversion didn't have a dedicated graphics artist.



Interface

Breaking out



▲ Whether watching or playing, the spectacle of the Darwinians at war was awe-inspiring.



▲ The escape mode in *Prison Architect* turns the tables and has players assuming the role of a prisoner hell-bent on getting out of jail.

FAILING TO SUCCEED

Had Introversion not reached rock bottom in 2010, Morris reckons it may not have made *Prison Architect*. "It was the burning to the ground of the old company and the mistakes that we'd made which created the ability for us to make *Prison Architect*," he says. "There were mistakes that we didn't even know were mistakes at the time, but I found that reading stories of big entrepreneurs who failed but went on to grow and have their huge success helped us through the dark times. Anyone struggling today can look at us and see that going through a bad time is almost a necessity to be successful. You can't get there without it."



▲ Introversion won multiple awards at the Independent Games Festival in 2006 with *Darwinia*.

categories of game, although that has only become apparent as the years have gone by."

Darwinia began life when Delay took part in the first Indie Game Jam in March 2002. The Game Jam asked attendees to generate and display 10,000 sprites on screen at one time, using an engine created by Chris Hecker. Delay was inspired by the concept and, together with programmer Andrew Bainbridge, whom he'd met at Frontier Developments, he began to create a war game that would eventually become *Darwinia*. With its tiny, blocky sprites, Delay's game had a retro flavour, and mixed elements of god game and strategy with puzzles and action. *Darwinia* soon became a personal labour of love, as Delay threw in ZX Spectrum-style loading screens and a character named Dr Sepulveda, who bore more than a passing resemblance to Sir Clive Sinclair.

LEARNING FROM THE PAST

It's to this sort of experimentation that Introversion looks set to return. After all, *Darwinia* was a critical triumph when it came out in 2005, attracting a strong fanbase and, after winning the Seumas McNally Grand Prize of \$30,000 at the Independent Game Festival in 2006, helped raise the studio's profile. "We probably wouldn't be here if it wasn't for *Darwinia*'s success at the IGF awards," says Morris. "The game also resonated strongly with a core group who really understand what games like *Darwinia* and *Scanner Sombre* are about."

Introversion followed *Darwinia* with the real-time strategy game *DEFCON*, which simulated a nuclear war and riffed on Cold War-era movies like *WarGames*. Casting the player as one of six warring superpowers, it kept a tally on the number of civilians killed. The game was released at a wallet-friendly price, and was another critical success.

"Strong-themed simulation games have been a running theme for Introversion, and *DEFCON* sold well," Morris says. "But switching between games of this type and more artistic titles such as

Darwinia and *Scanner Sombre* had actually been a psychological requirement. Once Chris finishes exploring one kind of technical simulation-based project, he moves on to something else. In each case, we learn things not just about games but the state of the market at the moment. So long as we're putting out interesting, well-executed, relatively large and not trivial experiences, I'm happy."

ROCK BOTTOM

In that sense, Introversion has few regrets – though *Multiwinia*, a lighter, multiplayer follow-up to *Darwinia*, would prove to be a dark chapter for the studio. Its unexpectedly slow sales threatened to push Introversion towards collapse, but Morris maintains that *Multiwinia* was "borne out of circumstance" – in short, to satisfy Microsoft's demand for a multiplayer take on *Darwinia*.

Multiwinia was planned as an Xbox Live Arcade title, but Introversion also worked on a PC version, which launched first. Sales proved devastatingly poor, yet the company was effectively forced to push on with the XBLA version, requiring it to employ more staff and buy extra dev kits in order to get the game through Microsoft's arduous approval process. Introversion accumulated a hefty debt as a result, and figured it would need to sell 30,000 units to pay it back. When the game – named *Darwinia+* – eventually came out in 2010, it fell short of the sales target.

"We got rid of all the staff, and the directors went part-time," Morris recalls. "We weren't really doing anything, and we only had a trickle of money coming into the business from the back catalogue that was on Steam. We owed a relatively large amount of money to a number of firms, and we told them that it would take a year or two to repay them. Their option was to let us do that or push us into administration. I was very heartened that most of the firms forgave some of the debt and told us not to worry about it."

LOCK DOWN

Even so, it was a low point. Introversion was forced to leave its London base – a beautiful four-storey Georgian townhouse – and take stock. This was something of an extra blow, because one of the reasons why the company could still call itself “the last of the bedroom programmers” was down to having that office: two of the rooms actually contained beds. Arundel’s sister, Vicky, who was working as the developer’s marketing manager, even lived there. Suddenly, all of that was gone.

Indeed, it was a pure stroke of luck that eased Introversion back from the brink. A new digital storefront called Humble Bundle emerged, which allowed players to determine the price they wanted to pay for collections of games. It launched in 2010, and a year later, a bundle consisting of *Darwinia*, *DEFCON*, and *Multiwinia* earned Introversion £100,000. Then *Prison Architect* emerged, and in Delay’s mind, the company has barely looked back since.

Today, rather than follow the same trajectory of music and film – “You’d have a big hit or a big album, and then be under pressure to get the next one out,” Morris argues – Introversion intends to adopt an organic approach to creativity. While it has canned a previously announced title called *Order of Magnitude* (a sci-fi colony sim), it’s kicking around ideas of a similar theme, but taking time to do so.

“We don’t want to drag an idea out, or select the best idea from a bad bunch, or try to push an idea forward when it’s not ready to be pushed forward, like we did with *Scanner Sombre*,” Morris continues. The emphasis, he adds, will continue to be on “producing games that haven’t necessarily been done before.” Meanwhile, Introversion is also keen to learn from the past.

“Once upon a time, Chris would come along and say ‘This is the next game idea’, but now

he’s a little bit more discriminatory,” Morris says. “He’ll tell us about a good game idea and list the reasons why, and those reasons are generally references back to things with which we’ve had success in the past.” At the same time, the developer plans to look ahead and forecast what is set to be interesting in a few years’ time.

“You see trends which run for a little while, especially in Hollywood, where they’ll go through particular cycles,” Morris begins. “For example, there was a once a glut of near-future sci-fi which felt really fresh because everything up to that point had been long-term sci-fi. They all touched on the same sort of look and feel, and then went away because something new came along.

“I reckon the new things happen because somebody in some obscure Belgian film festival or whatever creates a film with a fresh look, or that’s set in a place that hasn’t been explored for a while. That’s kind of where I want Introversion to be – not a developer that wants to capitalise on what was big last year, but on what is going to be big in two years’ time.”

Certainly, Morris can see Introversion continuing for another 20 years. “I really hope so, and I really want it to,” he says. “I love this industry and how it changes all the time. I love how, every year, there are new challenges and new opportunities, and that people want to play new, interesting, and exciting games. Today, a hundred or so games land on Steam every day, and it’s a real but fun challenge to get eyeballs on what you have to offer. I definitely want to keep fighting. I want to keep producing great stuff as long as Chris is having ideas.”

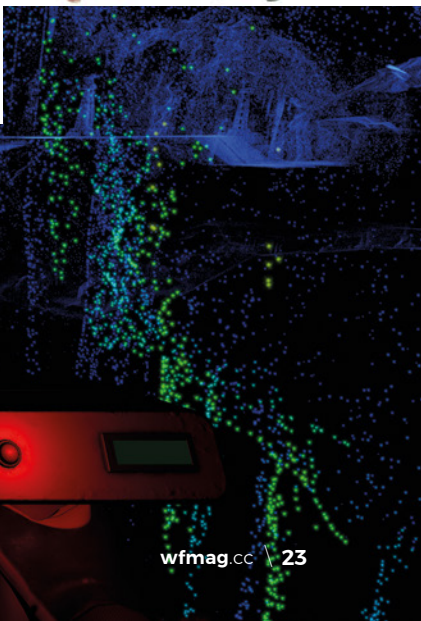
“We got rid of all the staff, and the directors went part-time”

▼ *Scanner Sombre* hasn’t fared too well in terms of sales, but it remains an absorbing first-person exploration game.



▲ *Darwinia+* was created for Xbox Live Arcade following a request by Microsoft, and combined elements of *Darwinia* and *Multiwinia*.

▼ Introversion: still going strong after almost 20 years.





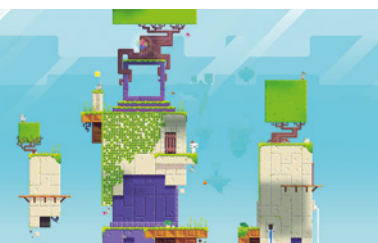
▲ As in the original, the aim is to manipulate the world's perspective and collect all the cube fragments.

Interactive FUZ

We catch up with Henry Stadolnik, a US student who's managed to demake the classic Fez for PICO-8

Are you a solo developer working on a game you want to share with Wireframe? If you'd like to have your project featured in these pages, get in touch with us at wfmag.cc/hello

▼ Phil Fish's Fez had a big impact on Stadolnik. "I don't think I've ever really played anything else quite like it," he says.



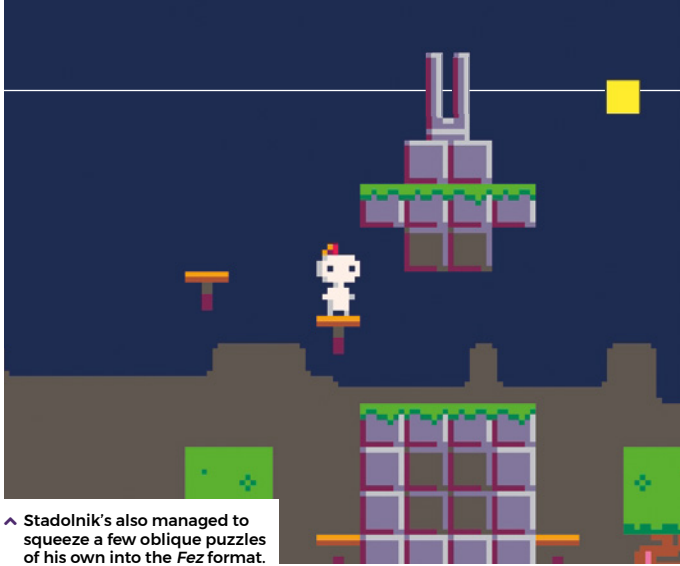
It's over seven years since the release of *Fez* – designer Phil Fish's platform-puzzler that, with its eye-catching spatial shifts and evocative pixel art and music, felt entirely unique, even as it riffed on such video game staples as *Super Mario Bros.* and *The Legend of Zelda*. *Fez* is old enough, in fact, that its influence is now being felt in the players who enjoyed it in their youth, and are just now beginning to take their first steps into the realm of game development.

For Henry 'Jusiv' Stadolnik, who lives in Massachusetts, the impression of *Fez*'s gently surreal fantasy world has never left him. When Stadolnik originally got into playing it in his early teens, he was soon swept up in its puzzle-solving and atmosphere: "It's got a cool art style, charming sprite work, a phenomenal soundtrack – Disasterpeace is consistently outstanding – and inventive mechanics and puzzles. I don't think I've ever played anything like it."

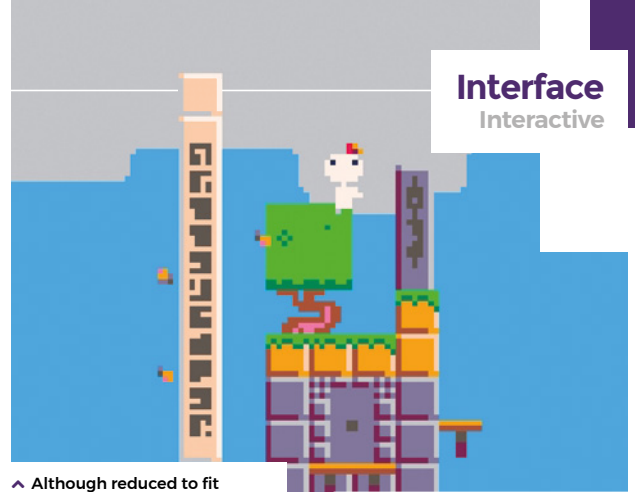
What really stood out for Stadolnik, though, was its use of language: namely Zuish, a series of geometric glyphs carved into *Fez*'s crumbling architecture. Easily overlooked as mere background details at first, there were subtle

clues that these glyphs could be translated – and within days of *Fez*'s release, the web began to fill up with translations, and how the glyphs could be used to solve the game's deeper mysteries. "If I had to single out a particular favourite thing," Stadolnik says, "I'd have to say the Zuish language... There was even a time in high school when I'd memorised enough Zuish to be able to write in it."

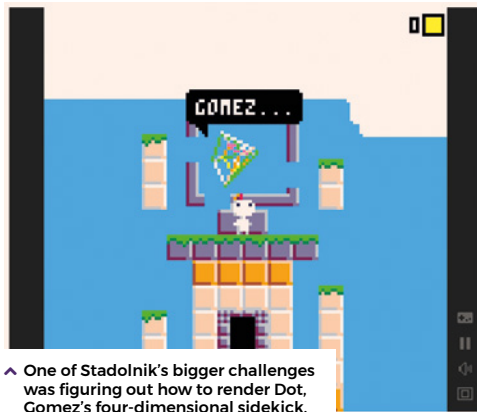
Now a college student studying computer studies and game development, Stadolnik has created the ultimate homage to *Fez*: he's managed to fit a miniature demake of it into PICO-8. As we saw in issue 12, PICO-8's a programming environment that, with its 128x128 pixel display and 32kB of memory, provides a fun challenge to developers of all kinds. And just as we've previously seen demakes of *No Man's Sky* and *Another World* tailored for the fantasy console, so Stadolnik's crammed an instantly recognisable version of Phil Fish's classic into a tiny space. This is an even bigger feat than it initially sounds, given the complicated world-rotating mechanic devised by Fish and programmer Renaud Bédard in the original *Fez*.



^ Stadolnik's also managed to squeeze a few oblique puzzles of his own into the Fez format.



^ Although reduced to fit PICO-8's resolution, *FUZ* contains many of the original's flourishes, including flapping butterflies and moving clouds.



^ One of Stadolnik's bigger challenges was figuring out how to render Dot, Gomez's four-dimensional sidekick.

says that creating new iterations of those glyphs was little more than "an afternoon's work," there were greater obstacles elsewhere.

"The most challenging aspects to code were the systems for colliding with the world and for drawing Dot, your hypercube companion," Stadolnik says. "The former was technically the larger feat, but I'd never programmed a 3D perspective projection, never mind a 4D one, so figuring out how to get Dot to properly render was a bit of an ordeal. The collision code was tricky because it had to scan through the area data differently from each perspective, figure out whether the player was exposed in the open, and reposition them onto valid floor tiles accordingly."

Given that we're unlikely to get a true sequel to *Fez* anytime soon (Phil Fish left the industry in 2013), it's perhaps unsurprising that players tore into *FUZ* with relish – so much so that some players managed to uncover its mysteries within hours. "I guess it was a little surprising that someone found even the most buried secret within six or seven hours," Stadolnik says.

"But then, given that people tracked down the music image puzzle in the original within the first six hours, that just seems to be par for the course with *Fez*-related things."

Stadolnik's already ruled out the likelihood of making a larger version of his PICO-8 tribute, perhaps spread over multiple carts like Nick Walton's *Notemon*, previously seen in issue 7; "I don't think I have enough ideas at present to actually make it worthwhile to try to create," he says. All the same, Stadolnik's well and truly caught the game-making bug, and plans to make lots more games, in PICO-8 and beyond. "The more I create, the more thoroughly I realise this really seems to be my calling," he tells us. "I'd love to release a larger indie game someday, and I do have a whole summer of time ahead of me, but I can't promise anything yet." 🐣



^ "Because I made the levels as voxel models from the start, the rotation effect was actually surprisingly simple to implement," Stadolnik tells us.

"*FUZ* started with the idea of seeing if it was possible to recreate the rotation and platforming systems of *Fez* in something as limiting as PICO-8," Stadolnik explains. "I technically started *FUZ* in the summer of 2017, when I got the idea for how to store and render the levels (they're essentially voxel models stored in slices on the sprite sheet, with each colour pixel corresponding to a specific type of tile). I toyed around with the prototype of it for a couple of days, but got stuck on making the collision work consistently and shifted to other projects."

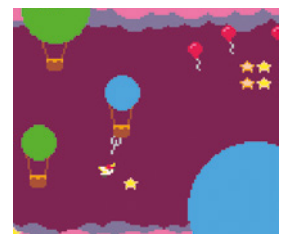
"There was a time when I'd memorised enough Quish to be able to write in it"

FUZZY LOGIC

Stadolnik picked the project back up in spring 2019 this year, though, and after another month or so's work, uploaded the finished *FUZ* to the web in May. And while *FUZ*'s world is inevitably small – it amounts to a handful of locations, compared to the dozens seen in the original – what's immediately striking is how closely it replicates the most prominent features we saw in *Fez*: the rotating voxel worlds that hang in the sky-like little islands; the pale hero, Gomez, with his red hat and wide, staring eyes; and even a reworked rendering of Quish. While Stadolnik

BIRD STRIKE

Aside from *FUZ*, Stadolnik's made a wealth of other miniature games, which you can find on his website (jusiv.me). Among our favourites is *I Just Wanna Land*, a PICO-8 score attack game in which you control a bird as it flies skittishly between deadly balloons in search of point-earning stars. *I Just Wanna Land* was, like many of Stadolnik's projects, created as a game jam entry. "As far as I'm concerned, game jams are probably the single best way to get into making games," he tells us. "They force you to make something small and manageable, and serve as a stellar way to get a sense of the workflow and to prove to yourself that you can, in fact, make something."



^ *I Just Wanna Land*, created for a 2018 game jam, features some entertainingly tricky controls to master.

Open development's weakness and wonder



LOTTIE BEVAN

Lottie's a producer and co-founder of award-winning narrative microstudio Weather Factory, best known for *Cultist Simulator*. She's one of the youngest female founders in the industry, a current BAFTA Breakthrough Brit, and founder of Coven Club, a women in games support network. She produces, markets, bizzes and arts, and previously worked on *Fallen London*, *Sunless Sea*, *Zubmariner*, and *Sunless Skies* as producer at Failbetter Games.

“Open development is pumping a handcar along a stretch of railroad, picking up as many passengers along the way as you can”

Open development is a godsend for indies. There's a quote I always trot out when talking about it, from Roger Zelazny's *Lord of Light*: “An army, great in space, may offer opposition in a brief span of time. One man, brief in space, must spread his opposition across a period of many years if he is to have a chance of succeeding.”

I usually make an awkward feminist joke about how much I love the traditional use of masculine pronouns for gender-neutral statements, but the point's still valid. If you have megabucks, you can advertise your game over a short period of time. Think ads on the sides of buses, K/DA-style promotional music videos, paid influencer streams, and Keanu Reeves revealing your release date at E3. But if you're indie, you rarely have the money for grand gestures like these. That's why indies increasingly seem to be turning to open development, where you pay for your audience and sales not in cold hard British pounds, but with time. Time spent tweeting in-progress art assets, blogging about your design intentions, and posting GIFs of stupid bugs from beta on Imgur. And yes, that last part was the most 2019 thing you'll read all week.

We're seriously committed to open dev at Weather Factory, but to avoid shameless self-

promotion, take a look at people like Unknown Worlds (who made their entire *Subnautica* production board open to the internet), Mega Crit Games (who ran a brilliant and brilliantly savvy Early Access campaign for *Slay the Spire*) and Grey Alien Games (who've by their own omission managed a decades-long career as a super-indie without ever making a 'hit' game). Open development is pumping a handcar along a stretch of railroad, picking up as many passengers along the way as you can before you reach your terminus. If you do it well, you can end up delivering the same number of passengers as the sleekest, swankiest express train there is.

However, even though I love it, open dev isn't perfect. My co-founder Alexis Kennedy talks of game design as 'moving the pain around', meaning that you're always prioritising one part of the game at the expense of another. The real strength of open dev is you being able to communicate with your audience directly, inviting people to hop up on that handcar like one friend to another.

So a real weakness of the system is when that communication breaks down, whether that's because of difficult circumstances, publisher limitations, or something as simple as localisation. Translating *Cultist Simulator* into simplified Chinese caused all manner of difficulty: how do you excite new Chinese-speaking players who have no previous relationship with you and no reason to trust you? How do you convince them that they should buy a game defined by western touchpoints like H. P. Lovecraft and Mary Renault? It's a doozy, and a whole other article. But it's a 'You cannot go that way' message at the edges of open development, and it's worth knowing where those messages are.

I wonder how many other invisible walls I'll bang into with open dev, and whether they'll ever add up to enough of a downside to make me drop the system. Talk to me in ten years when my company's bigger – maybe I'll see you around at E3. 🙄



^ Open development: much cheaper for indies than hiring Keanu 'You're Breathtaking' Reeves.

Toolbox

The art, theory, and production of video games

28. Design Principles

Simple complexity, and why it's a vital design goal

30. CityCraft

How to devise a virtual city from scratch

32. Text as texture

Using snippets of story and dialogue to enliven your game

38. Source Code

Recreate Lemmings' path-following critters

40. Making Anew: Part 6

Marketing for time-strapped indie developers

42. Directory

Code an adventure game: a free online course



▲ The programming secrets behind those bumbling lemmings. See page 38.

▼ Find out how to create richer, more involving worlds with snippets of story and dialogue on page 32.



The principles of game design

Simple complexity should be the goal of every game designer, Howard writes



AUTHOR
HOWARD SCOTT WARSHAW

Howard is a video game pioneer who authored several of Atari's most famous and infamous titles. onceuponatari.com

Do you like things simple or complex? The KISS principle says Keep It Simple, Stupid. But sometimes, simple is boring, and complexity is needed to inspire interest. It could depend on who we are. Some people like to keep things simple because that's easier. Some prefer things more complex because that creates more possibilities and opportunities. But in my last column, we talked about what your games say about you. Today, I'm talking about what a game suggests about itself; specifically, the relationship between how much work it takes to make the game and what the yield is on that work. How vast a result did your time and effort generate?

I think about simplicity and complexity quite a bit – they're topics that keep coming up everywhere I go. In some ways, they're two sides of the same coin, or at least two ends of the same scale. Another thing I think about a lot is systems. In fact, I regularly find myself assessing the simplicity/complexity of systems I encounter. Every system has two aspects to consider: the mechanism itself and the implications of its use. Every video game is a system too, and has these two aspects. The mechanism is the game content (code, graphics, and so on),

and the implication of its use is the player experience. Each of these aspects can be simple or complex.

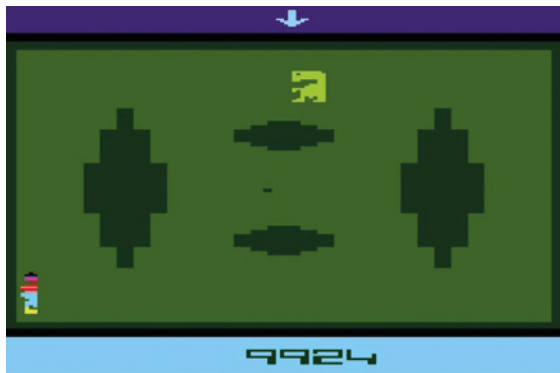
Every game has either simple or complex content, and it provides a simple or complex experience. This results in four content/experience game pairs: simple/simple, simple/complex, complex/simple, and complex/complex. Simple/simple is games like flipping a coin or noughts and crosses – easy to learn, but they don't hold our interest. Next, we have complex/complex, like elaborate adventure games or American football. These are enduring games, but the rulebooks and guides can be huge. In these cases, the level of effort to create the games reflects the depth of the experience.

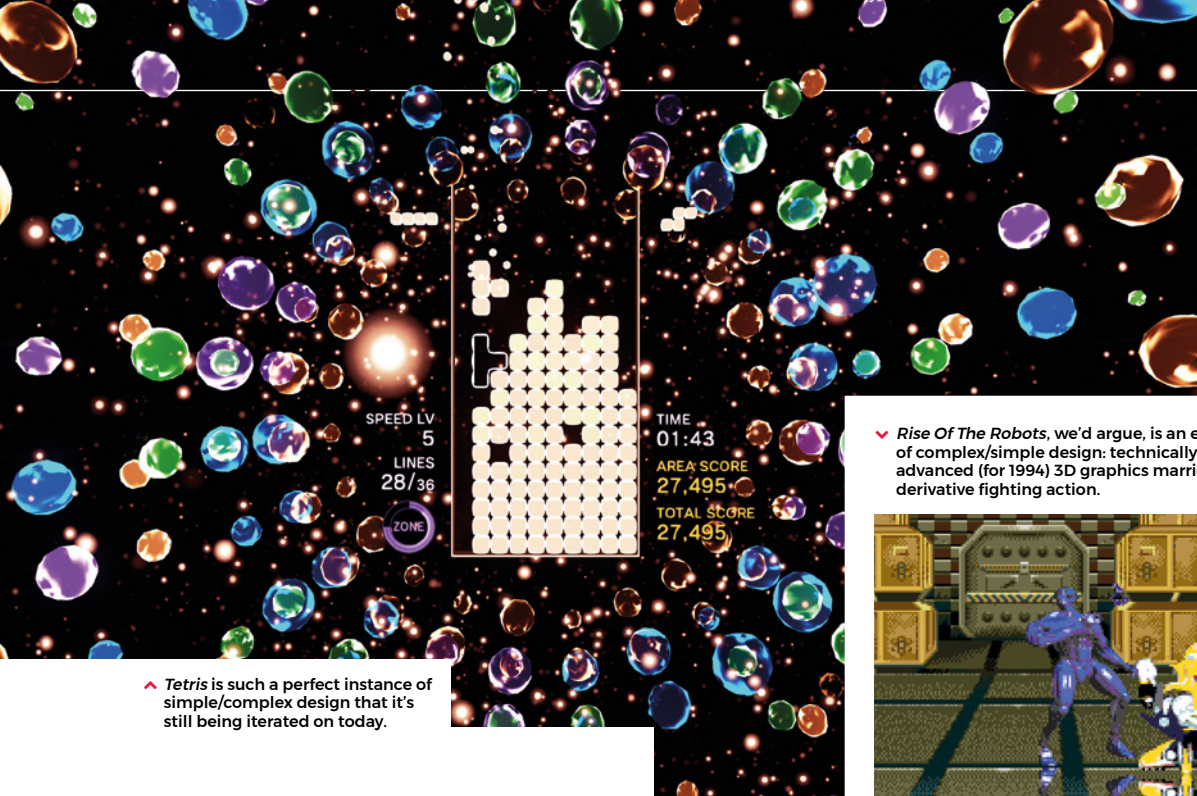
HYBRID PAIRS

On the other hand, the hybrid pairs are much more interesting. They (not unlike my own Atari games) include the best and the worst of game design. In my opinion, the best designs use a simple effort to generate complex possibilities. The worst occur when a complex effort yields simple or limited possibilities. One thing is for sure: when you talk about development *time*, complex content takes longer to implement than simple content.

Remember: a game, at its root, is simply a set of rules in a well-defined environment with a goal and a starting setup. Implementation effort comes down to the number and type of rules, and what's involved in creating the environment. Some games have few rules, and some have lots. That doesn't make them better or worse games, but it does change the development time.

✓ Warshaw famously had just five-and-a-half weeks to complete *E.T. The Extra-Terrestrial*.





▲ *Tetris* is such a perfect instance of simple/complex design that it's still being iterated on today.

▼ *Rise Of The Robots*, we'd argue, is an example of complex/simple design: technically advanced (for 1994) 3D graphics married to derivative fighting action.



The big issue is, how does each rule affect the play experience?

Consider complex/simple games: these games die quickly, killing their makers in the process. Would you spend huge resources delivering a lame game? No-one does it twice.

And finally, let's talk about simple/complex. This is the holy grail of gaming: deep, rich gameplay which springs from a simple premise. Chess and Go are great examples of this. Simple rule sets in simple environments that generate innumerable possibilities (OK, numerable, but the numbers are incredibly large). *Tetris* is a quintessential model of ingenious design. How simple is *Tetris*? Easy to understand. Easy to operate. Virtually any game system can implement it, and yet the gameplay endures because the challenge sustains.

“Remember: a game is simply a set of rules in a well-defined environment”

BUSHNELL'S DICTUM

Nolan Bushnell had a brilliant dictum on game design. He said: “Easy to learn, tough to master!” Translating this into my own kind of speak: hit the simple/complex game pair!

Bushnell's quote exactly describes an optimal coin-op game. Tantalising enough to entice the first quarter, challenging enough to keep them coming. No barriers to entry and no simple exit. Challenge must rise by perfectly mirroring the game's learning curve. When I began at Atari, I took that as a starting point... then I departed quickly. In fact, I made a career out of violating it.

I realised that home games don't really have the same restrictions. ‘Tough to master’ must remain in force, but home games needn't be quite so easy to learn. After purchase, the player

is motivated to find value, so they'll work harder to learn the game. This realisation emboldened me to take another tack. After all, if adding a little complexity will significantly enhance the play experience, that's a good trade-off. Right?

I began to look at the process of game design not as restricting rules, but rather as adding goals and rules... but only add ones which increase the complexity of the experience

more than they increase the complexity of the content. *Yars' Revenge* is full of this kind of thinking. Of course, with *Yars*, I had time to think.

When I was given a mere five weeks to do the *E.T.* video game, there was no time for thinking. I needed something simple to implement because that's all I had time for. But I also needed this simple approach to generate a complex web of possibilities to give the game legs. I tried to hit the sweet spot, but ended up somewhere a little sour in the eyes of many. I guess it depends on how you look at it.

Making trade-offs is what video game development is all about. Some people take a more restrictive approach, thinking that adding things only creates opportunities for trouble in the form of bugs and development time. I believe an additive approach is more productive, as long as I remain mindful of the simplicity or complexity of what I'm adding and make accurate assessments of how this will impact the overall play experience. Every time I make a ‘profitable’ contribution, the game gets incrementally better. And isn't that what design is all about? 🤖

Complexity is baggage

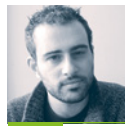
I prefer to think that everything can be understood at a simpler level. Much of the complexity we perceive is unnecessary baggage we bring to a task rather than inherent complexity of the issue itself. This is how we make things worse than they need to be. We do this until (and if) we figure out how to address things more effectively. I like to summarise this phenomenon this way: complexity is the process by which the obvious is obscured by the irrelevant.

▼ Atari founder Nolan Bushnell is a proponent of simple/complex design; tellingly, Atari is a reference to his favourite game, Go.



CityCraft: A town fit for dwarves

Konstantinos shows you how to create the foundations of an imaginary city from scratch



AUTHOR
KONSTANTINOS DIMOPOULOS

Konstantinos Dimopoulos is a game urbanist and designer, combining a PhD in urban planning with video games. He is the author of the forthcoming *Virtual Cities* atlas, designs game cities, and consults on their creation. game-cities.com

Mood Boards

Initial maps, sketches, and architectural ideas aren't meant to be final. They're guides that will evolve, and will be useful in guiding artists in their visualisation of the city – especially when supported by mood boards. These collections of photos, illustrations, references, inspirations, and screenshots are meant to evoke a style or mood that characterises the city. They aim to convey a theme, suggest a palette, and perhaps even describe a crucial landmark or a function. Text, maps, and sounds can fit in a mood board, too.

W

hen sitting down to work on this issue's *CityCraft*, I only knew I wanted to write something that would feel like a short, non-interactive

workshop. A piece that would provide you with an example of how the construction of an imaginary city could be approached, and suggest the first few yet crucial steps in this process. To avoid falling back on pre-existing solutions, though, I hadn't decided on the type of city I would present to you beforehand.

Instead, I resorted to four d20 dice rolls on my random city tables, and came up with a high-fantasy mountain town inhabited by dwarves. Do keep in mind that this article won't end with a completed city, but rather a draft you can build on. A properly fleshed-out city would require far more time, sketches, and detailed research.

GETTING STARTED

Handily, those initial dice rolls partly answered three key city building questions: where the

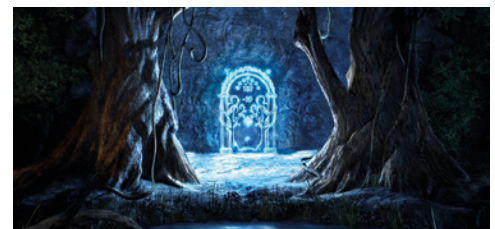
town is, when it exists, and how big it is. To make things more specific, I then decided on a settlement in a steep mountain range, set in a fantasy world of powerful magic where the dwarfs are the less magically-inclined race.

Dwarves tend to focus more on technological solutions, so their machinery should be slightly more advanced than that achieved by people in medieval times. Forges, cranes, and a variety of tools – as well as some partly magical contraptions – should be commonplace for the roughly six or seven thousand dwarfs living here, as well as for the few hundred subtly segregated humans.

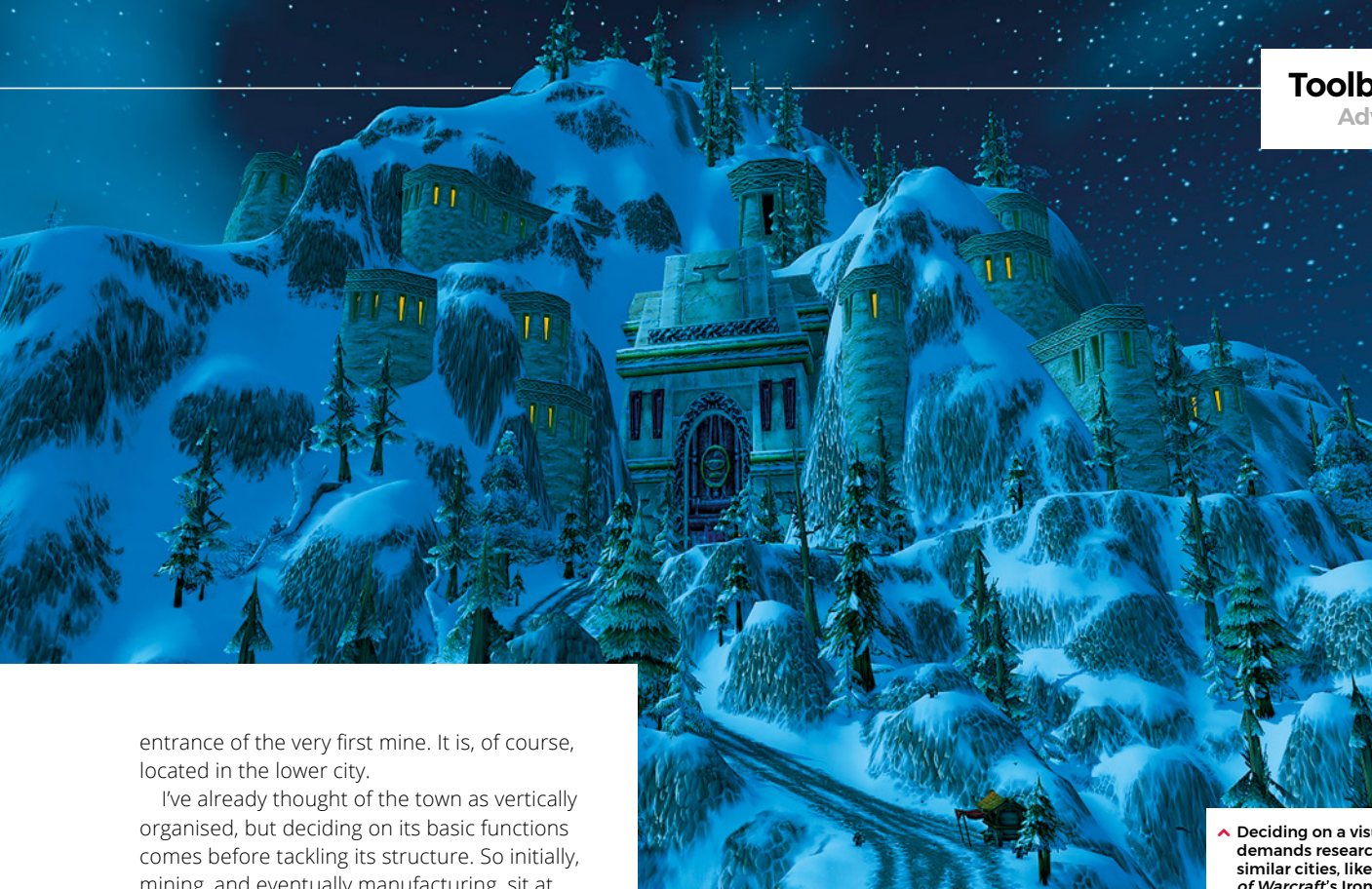
Thinking about the town's human community led me to also consider its history. The town has stood for over a thousand years, beginning as a small mining colony, rising to prominence when gold (or other metal) was discovered, and reaching its apex after the war against the humans. The existing human population is descended from captured warriors, who've been treated exceptionally well. As for the old, original town, its remains can be found close to the



◀ The architecture and organisation of Machu Picchu can be the source of inspiration for any stone-built mountainous settlement. Photo by Colegota.



▲ Motifs and decorations can add character and consistency. This one was borrowed from *The Lord of the Rings Online's Mines of Moria* expansion.



▲ Deciding on a visual style demands researching similar cities, like *World of Warcraft's Ironforge*.

entrance of the very first mine. It is, of course, located in the lower city.

I've already thought of the town as vertically organised, but deciding on its basic functions comes before tackling its structure. So initially, mining, and eventually manufacturing, sit at the heart of the local economy. It will also need forges, mines, wooden pulleys, blacksmiths, workers at manufacturers, and guild houses. Water is stored in subterranean cisterns, and collected from local wells, the nearby river, and rain catchers. The city grows most of its food inside its walls, in parallel to its other functions such as defence, transportation, residence, commerce, culture, religion, shelter, and entertainment.

The structure of the town will roughly follow the concentric rings model, adjusted to the steep slopes surrounding it, and will be organised as shown in **Figure 1**. In the centre (1) and at the top lies the citadel, acting as a governance centre, as well as the residence of the oldest and most powerful families. The ring surrounding it (2) is a mixed-use zone where residence is predominant, and where most social, cultural, and commercial activities take place. The following ring (3) consists of farms and urban fields, and is followed by a densely forested green belt (4) separating the residential part of town from the forges, workshops, and guild-run manufactories of zone 5. The outer and lowest part (6) contains the entrances to the mines, the old core, and defence structures as it is adjacent to the city's outer walls.

FILLING IN DETAILS


With a structure in place, we can move on to fleshing the city out. There are many aspects of urbanism that have to be covered, one of which

“I resorted to four d20 dice rolls on my random city tables”

is civic politics. Politically, the city will be a free town inside a wider confederation of dwarven kingdoms. Its society will be feudal, and thus strictly class-based, and driven by strong blood bonds and the concept of honour. A slowly rising artisanal and merchant class is starting to contest the status quo, but never openly nor in an organised manner. The poor are taken care of, and a strong sense of pride can be found in all workers, fighters, and artisans; communal traditions have survived despite the rise of a ruling caste.

Architecturally speaking, I'd imagine a sturdy, ornate style built from rock. A network of torches light the city at night, and buildings are organised in densely packed blocks with an average height of two to three stories.

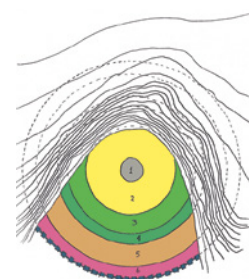
Then there's the road plan to think about. Roads should be wide enough for beasts of burden and carts, with a geometric layout adjusted to a radial grid with the citadel (1) as its centre. A main boulevard – possibly connecting two major temples – would divide zone 2 into two distinct districts.

With all this sketched, more questions remain. How can we best show off the city's dynamism? How strong are the boundaries between public and private space? Who runs the city guard? Have parts of town been carved inside the mountains? And last of all: can a city ever be considered finished? 

Meet the Residents

Cities are built by people, and in turn, change the people inhabiting them. This is a dialogue that never ends, and one that creates unique character types, professions, political views, entertainment, and traditions. It will spawn characters that players can interact with, talk to, or at least observe. Besides, there are few better ways of finding out about a place than talking to its locals. Making those locals fit and enrich their surroundings is all part of building a game city.

▼ **Figure 1:** This sketch, proposing the structure of the dwarven city, should guide the design team throughout its creation.



Text as Texture: Weaving atmosphere with words

How succinct snippets of story and dialogue can invigorate game mechanics in unexpected ways



AUTHOR
PAUL KILDUFF-TAYLOR

Paul is the CEO of Mode 7, an indie game developer and publisher. He has been the lead writer on all of their in-house games.

There tend to be two schools of thought on narrative design. Traditionally, it's viewed as the construction of a monolithic compendium of lore, bolted on to the game with the aim of fleshing out the world. A more modern perspective is to see it as an all-encompassing discipline, one intended to pervade the entire development process, influencing game designers, artists, animators,

and level designers so that their work is infused with drama and seamlessly aligned with the player's experience.

Reality mostly falls somewhere between these two poles. Not every story element can be expressed solely by the environment or through AI behaviour; equally, players don't generally want to plough through long expository diary entries. We can't always anticipate the direction gameplay will be taking during the development process, and so writers need to be adaptable.

This means developers, particularly those working on smaller projects, need to be tactical about text. When done right, this can provide an extra 'kicker' to a game mechanic, enhancing the player's emotional response or highlighting an emergent event. Text or voice acting can be a cue to pay attention, a cheeky hint, a signpost, or a wry aside. In addition to this, a great bark or UI text element can provide much-needed context: it can ground the player in the world and give them a sense of their own impact. Let's take a look at some practical examples...

STRATEGIC WORDPLAY

The triggers we use to display text don't have to be complex to be effective. In our turn-based tactical game *Frozen Synapse*, we use a straightforward bark system based on the number of units killed in the turn.

▼ *Frozen Synapse* uses a simple mission-based structure for its single-player campaign. This means that we can assign relevant barks for each individual level.





▲ **Figure 1:** Belacqua makes a sarcastic quip about the outcome of the previous turn.

PRIORITY ONE

If you add a lot of bark triggers, you will need to start prioritising. Vital instructions and key plot beats should be privileged, while exceptional events like multikills or devastating losses need to come a close second. Think about salience here: what does the player need to know, or what would a casual observer remark on? It's best to keep this text short, sharp, and optional. The player should be able to ignore it and clear it easily if they choose to.

This serves a triple purpose: cement the player's role as a tactical commander, remind them of what just happened, and provide a bit of light entertainment. In **Figure 1**, the player lost a single unit, but also managed to take out an enemy, so we have Belacqua (something of a comedy sidekick character) giving his opinion on the outcome.

This type of 'outcome trigger' (my term for a comment on 'what just happened'), while simple, can still lead to quite a rich system. You could consider adding triggers for the types of weapons used, the effectiveness of an attack, the time the player takes to make a decision, and more.

“Players don't generally want to plough through long expository diary entries”

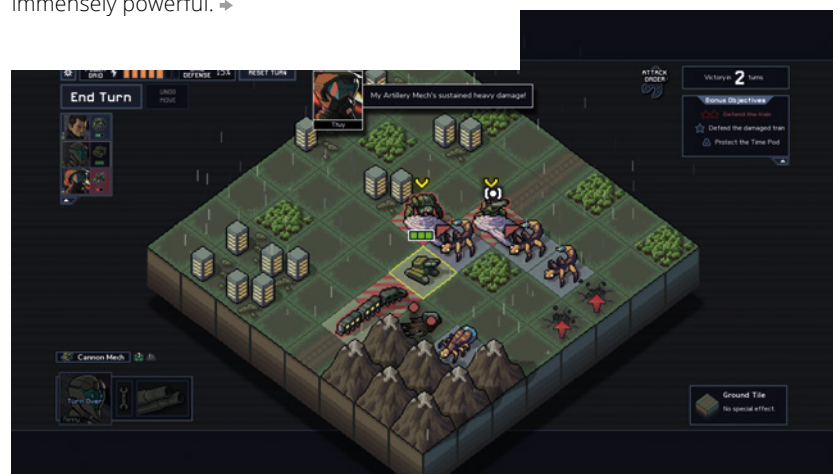
The player's relationship with the NPCs who are speaking matters hugely. *Frozen Synapse* has a mute protagonist, but the other characters know you can hear them – this occasionally leads them to unburden; you have no choice but to listen to them! This then allows for recontextualisation – if a character is always quipping, you can give them a moment when they're depressed or morose, and have them bark to the player while in a different emotional state. Having different bark sets for each level, or even character 'mood' if your game has a definition of that concept, can be immensely powerful. ➔

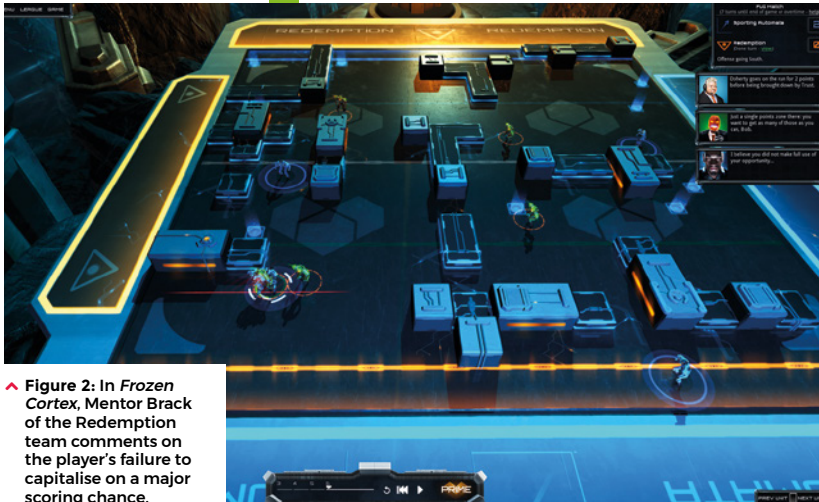
▼ **Subset's *Into the Breach* also makes use of outcome triggers to flag up important information to the player.**

FRAME PERFECT

Outcome triggers work best when they have context. In Origin's classic space sim *Wing Commander*, and many games subsequently, the impact of your wingman's barks are enhanced by the fact that you can have a fuller dialogue with them when you return to base, and by the narrative framing of the combat situation you find yourselves in.

Think about why characters are talking in the first place: are they chipping in because they're opinionated, concerned, angry, or showing off? What are they aiming to get out of the exchange?





▲ **Figure 2:** In *Frozen Cortex*, Mentor Brack of the Redemption team comments on the player's failure to capitalise on a major scoring chance.

CHARACTER BUILDING

Character is vitally important when it comes to barks and quips. In *Frozen Synapse*, the character of Belacqua was created mostly to give us an opportunity to bring some acerbic irony into a narrative which was otherwise fairly po-faced.

Comedic characters like this should be used as seasoning – too much quipping and they overpower the story and make it unpalatable; too little, and you risk a bland, leaden narrative which does little to acknowledge the player's inevitable position of detachment.

INFORMED OUTCOMES

On *Frozen Cortex*, a turn-based game based around a futuristic sport, our gameplay AI system is aiming to score goals by moving the ball into the appropriate endzone. To accomplish this, it iterates through every possible attacking plan, then tries to construct a defence which can defeat all of them.

As a neat side effect, this enables it to evaluate the likelihood of a score occurring on any given turn. We can use this information to our advantage when creating outcome triggers: essentially, we can be more informed about the current game situation.

Let's say the player has just scored a goal against an AI opponent by passing the ball into the endzone. We can trigger an appropriate outcome bark from the opposing team's coach based on how likely the player was to score from their previous position – we can effectively comment on the player's skill (see **Figure 2**). Here's a selection of such barks from an in-game script file:

```
bark_completionEndzone_aiDefense_00Cold_0:
Yes, that was utterly obvious. Let us
continue.
```

```
bark_completionEndzone_aiDefense_00Good_2:
Well, I must concede that was a good pass.
```

```
bark_completionEndzone_aiDefense_00Bad_2:
Well, I believed we had a good setup there.
Clearly that was not the case.
```

```
bark_completionEndzone_aiDefense_00NoOPPlans_0:
I'm flabbergasted!
```

These are triggered when a pass has taken place, it has been caught in the endzone for a goal, and the AI is defending. **00Cold** refers to a situation where it is literally impossible for the defence to prevent a goal if the player does the right thing, whereas conversely, **00NoOPPlans** would fire when the AI believed that the player had zero chance of scoring.

We also have bark sets for different types of attacking play, such as short runs, long runs, passes resulting in bonus points, and so on. This kind of specificity allows the AI's reaction to be appropriate.

STATE OF PLAY

IO Interactive's modern take on the *Hitman* franchise demonstrates an effective use of barks, with panicked members of the public exclaiming in shock as they witness you choking out a guard. It's important to recognise that this signifies both a notable event and a meaningful change in game state: being spotted usually means you have to flee.

This elevates the bark simply from reporting on an outcome to being illustrative of a game's internal process, something which can not only inform, but also surprise and delight players.

In *Frozen Cortex*, we can not only report on an event after it has happened, but also give a 'status update' on the AI's thought process while it's making calculations. For example, if the AI is making a challenging call, it can express doubt with barks like these:

```
bark_hasDichotMoreThan2_AIDefense_1: I gotta
pick something...
bark_hasUncoveredInBest_AIDefense_0: We don't
have much info on this one...
bark_hasUncoveredInBest_AIDefense_1: I could
see this going either way...
```



▲ **Figure 3:** *Frozen Cortex*'s Professor Turek brings an analytical approach to the game, and his dialogue reflects this.



▲ *Hitman 2's* narrative framing allows for a highly reactive environment and characters who frequently verbalise their responses. It makes sense for these characters to be shouting out - they've just seen something terrible!

It could also bait the player, based on their situation:

bark_NoOptionsNoThrows_aiDefense_0: No more passes for you and nowhere to run!

While tactical situational barks are great, it's important not to neglect the overall game state. Our AI calculates an overall chance to win the match, and so once again it can bark based on the specific event which caused the change to occur:

bark_ctwAIGoingToWinTurnover_0: Ah yes! We caught them out there! We've got this!

bark_ctwAIGoingToWinLowTime_0: You're out of time there, \$humanPlayer.

Again, it's important to establish the context for all this verbiage. Our matches are framed as a duel, with a named character who will call you up prior to their team taking the field (see **Figure 3** for an example of this dialogue). Outside of the matches is a conventional linear story, which helps to give the characters more defined roles in the world. Even if your game relies on random encounters (as a sports game necessarily does with its league structure), consider adding a small linear component as well; this can serve as a useful anchor. ➔

OPPOSING FORCE

When you're using text to add some flavour to generic enemy or AI actions, it pays to think about clashing ideologies. How could one group annoy another, and what would the response be? Even if your game has quite simple systems, you can still tell intriguing small stories through coincidental events.

GET SPECIFIC

Consider the following situation: the AI has the ball but is surrounded by the player's defenders. Out of nowhere, it comes up with an incredible run to the endzone. When the coach is celebrating, we can be really specific about how unexpected the situation is. Here are some of the barks we used for different characters:

"Praise the pattern! A dire circumstance transforms into success!"

"Getting out of that strategic black hole was inspired play, if I do say so."

"What? Am I really that good? Obviously, I am!"



◀ AI-heavy games like *Frozen Cortex* may present some unconventional opportunities for textual feedback.

NOTHING TO SAY?

In some instances, such as during loading, there isn't always a meaningful game state to report on. This can be a great opportunity to drop a bit of backstory, some hints, or even a little context-free banter between two NPCs. Try to think unconventionally here – dull 'loading tips' can undermine a game, whereas something unexpected can keep the player interested through what might otherwise be a tiresome interruption.

✓ **Figure 4: The Frozen Synapse 2 city view showing a venture taking place.**



DETAILED DIALOGUE

We're occasionally given space for the player to interact with NPCs outside the confines of combat or the main game loop. In these situations, it's still important to maximise opportunities for contextualisation and characterisation.

Mode 7's *Frozen Synapse 2* is an 'open-world tactics' game where players can move around a large procedurally generated city encountering various factions. The player is able to call up rival faction leaders, and vice versa. Chats can be scripted using variables that are populated by data from individual faction files.

Characters will call up the player, greet them, and make a reference to a recent event. Here's a simple example where the AI has just defeated the player at one of their minor bases:

```
chatVariant[]:
    event: I_ATTACK_TEAM_AT_
NONHQ_OWNED_NODE_SUCCESS

    text: <$speakerteam.
WeDefeatedYou> at <$nodeName>. <$speakerteam.
WeveGotTheUpperHandNow>.

    button: CONTINUE
```

If we take a look in the faction file for Blue Sunlight, a religious cult, we can see the following:

```
WeDefeatedYou: We were able to triumph
over you
```

“It's possible for narrative to permeate other areas of your design”

This is fairly generic, but we've used the opportunity to employ some unique diction for this faction here.

```
WeveGotTheUpperHandNow: Sonata is leading her
community into glory - your weak efforts pale
in comparison to her beauty
```

This is much more faction-specific, and we can start to bring wider lore into play.

A system like this allows you not only to have characters commenting accurately on recent events, but also to give their opinion on them in a distinctive way. Using flexible phrases for each faction can help keep the amount of content needed from spiralling out of control – here's a further example from Blue Sunlight's file:

```
ThingsAreMovingForwards: Our progress towards
the Union continues
annoying: vexing
TheyAreGood: They have a strong understanding
of their responsibilities
suggest: advise
ItoldYouToStayOut: You have persisted in your
aggressive violation of our territory
```

As long as the player doesn't end up seeing too many repeats, you can reuse phrases like these in different situations quite freely.

AMBIENT NARRATIVE

I've focused a lot on dialogue and barks, as these are simple ways to add texture to your game. But, as I mentioned at the outset, it's possible for narrative to permeate other areas of your design.

In *Frozen Synapse 2*, factions undertake missions we call 'ventures'. These usually take the form of spawning a squad, sending it somewhere in the city, then performing an action there. While the venture is in progress, the faction is vulnerable to attack from either the player or a rival AI force.

As the structure of ventures is fairly simple, they can be used for all sorts of narrative purposes.

Let's take a look at the faction file for Diamond Brothers, a banking faction who largely control the city's finances:



^ Defiant's Hand of Fate uses a characterful antagonist to increase the competitive stakes for the player.

occasionally:

```

        venture[]: v_
manipulatestockmarket
        venture[]: v_
hostbankingconference
        venture[]: v_laundermoney
    
```

This group of ventures happen periodically – they're just something we want to be going on in the background, independent of the faction's level or other activities.

When a venture is going on, the player will encounter it in various ways:

- Diamond Bros venture squads will move around on the map
- Several UI notifications will appear
- The faction performing the venture may comment on it during calls
- Other faction leaders may comment on it during calls
- A city district may call up the player, complain about the venture, and ask them to stop it

While ventures do have a gameplay component – they are minor optional missions that the player can undertake, as well as contributing to the faction's overall power level and district relationships – their main function is to illustrate the faction's personalities.

Let's say `v_manipulatestockmarket` is taking place. If you call up the Diamond Bros leader, he'll use the following phrase to describe it:

```

midVentureChat: attempting to correct some
of the erroneous financial practices we've
observed at the city's stock exchange
    
```

Another faction, one who dislikes that particular venture, will say this:

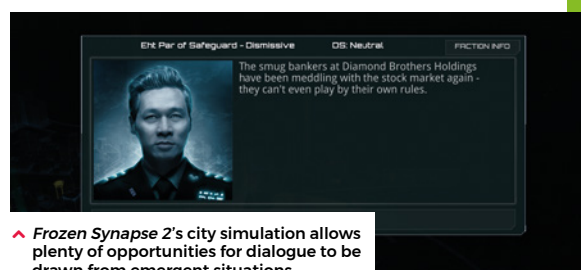
```

antiVentureChat: they have been meddling with
the stock market again - they can't even play
by their own rules
    
```

Giving the player different perspectives on a single action can lead to some interesting narrative nuance. Do they want to allow this practice to continue – how does it chime with their personal morals? Do they accept the justification of the faction involved or listen to one of their rivals?

WEAVING IT ALL TOGETHER

By taking a tactical approach to game narrative, and grabbing opportunities when player actions, AI or simulation presents them, you can add a great deal of polish and additional excitement. Responsive dialogue or the ability to view an event from multiple perspectives will enable your players to tell their own stories about what's happened, as well as bringing them deeper into the world you've created. 🗣️



^ Frozen Synapse 2's city simulation allows plenty of opportunities for dialogue to be drawn from emergent situations.

QUALITY AND QUANTITY

Flexible dialogue systems are great for lively NPC interactions, but they can result in an explosion of content and overworked writers! The best way around this is to get placeholders in for everything you think you'll need as quickly as possible, and then look at the frequency with which different dialogue triggers are firing. If you can identify phrases which are being used constantly, then that's where you'll need to target the bulk of your variation.



Source Code

◀ The original *Lemmings*, first released for the Amiga, quickly spread like a virus to just about every computer and console of the day.



Path-following Lemmings

Learn how to create your own obedient lemmings that follow any path put in front of them



AUTHOR
RIK CROSS

Lemmings is a puzzle-platformer, created at DMA Design, and first became available for the Amiga in 1991. The aim is to guide a number of small lemming sprites to safety, navigating traps and difficult terrain along the way. Left to their own devices, the lemmings will simply follow the path in front of them, but additional 'special powers' given to lemmings allow them to (among other things) dig, climb, build, and block in order to create a path to freedom (or to the next level, anyway).

I'll show you a simple way (using Python and Pygame) in which lemmings can be made to follow the terrain in front of them. The first step is to store the level's terrain information, which I've achieved by using a two-dimensional list to store the colour of each pixel in the background 'level' image. In my example, I've used the 'Lemcraft' tileset by Matt Hackett (of Lost Decade Games) – taken from opengameart.org – and used the

'Tiled' software (mapeditor.org) to stitch the tiles together into a level.

The algorithm we then use can be summarised as follows: check the pixels immediately below a lemming. If the colour of those pixels isn't the same as the background colour, then the lemming is falling.

“Left to their own devices, the lemmings will follow the path in front of them”

In this case, move the lemming down by one pixel on the y-axis. If the lemming isn't falling, then it's walking. In this case, we need to see whether there is a non-ground, background-coloured pixel in front of the lemming for it to move onto. If a pixel is found in front of the lemming (determined by its direction) that is low enough to get to (i.e. lower than its `climbheight`), then the lemming moves forward on the x-axis by one pixel, and upwards on the y-axis to the new ground level. However, if no

suitable ground is found to move onto, then the lemming reverses its direction.

The above algorithm is stored as a lemming's `update()` method, which is executed for each lemming, each frame of the game. The sample `level.png` file can be edited, or swapped for another image altogether. If using a different image, just remember to update the level's `BACKGROUND_COLOUR` in your code, stored as a (red, green, blue, alpha) tuple. You may also need to increase your lemming `climbheight` if you want them to be able to navigate a climb of more than four pixels.

There are other things you can do to make a full *Lemmings* clone. You could try replacing the yellow-rectangle lemmings in my example with pixel-art sprites with their own walk cycle animation (see my article in issue #14) or give your lemmings some of the special powers they'll need to get to safety, achieved by creating flags that determine how lemmings interact with the terrain around them. ☺



Download
the code
from GitHub:
[wfmag.cc/
wfmag17](https://wfmag.cc/wfmag17)

Path-following critters in Python

Here's a code snippet that will send path-following creatures roaming around your screen. To get it running, you'll first need to install Pygame Zero – you can find full instructions at wfmag.cc/pgzero

```
from time import sleep
from PIL import Image

# screen size
HEIGHT=800
WIDTH=800

# level information
level_image = 'level'
BACKGROUND_COLOUR = (114,114,201,255)

# store the colour of each pixel in the 'level' image
img = Image.open('images/level.png')
pixels = [[img.getpixel((x, y)) for y in range(HEIGHT)] for x
in range(WIDTH)]

# a list to keep track of the lemmings
lemmings = []
max_lemmings = 10
start_position = (100,100)
# a timer and interval for creating new lemmings
timer = 0
interval = 10

# returns 'True' if the pixel specified is 'ground'
# (i.e. anything except BACKGROUND_COLOUR)
def groundatposition(pos):
    # ensure position contains integer values
    pos = (int(pos[0]),int(pos[1]))
    # get the colour from the 'pixels' list
    if pixels[pos[0]][pos[1]] != BACKGROUND_COLOUR:
        return True
    else:
        return False

class Lemming(Actor):
    def __init__(self, **kwargs):
    super().__init__(image='lemming', pos=start_position,
    anchor=('left','top'), **kwargs)
        self.direction = 1
        self.climbheight = 4
        self.width = 10
        self.height = 20

    # update a lemming's position in the level
    def update(self):
        # if there's no ground below a lemming (check both
        corners), it is falling
        bottomleft = groundatposition((self.pos[0],self.
        pos[1]+self.height))
        bottomright = groundatposition((self.pos[0]+(self.
        width-1), self.pos[1]+self.height))
        if not bottomleft and not bottomright:
```

```
        self.y += 1
        # if not falling, a lemming is walking
        else:
            height = 0
            found = False
            # find the height of the ground in front of a
            # lemming up to the maximum height a lemming
            # can climb
            while (found == False) and (height <= self.
            climbheight):
                # the pixel 'in front' of a lemming
                # will depend on the direction it's
                # traveling
                if self.direction == 1:
                    positioninfront = (self.pos[0]+self.width,
                    self.pos[1]+(self.height-1)-height)
                else:
                    positioninfront = (self.pos[0]-1, self.
                    pos[1]+(self.height-1)-height)
                if not groundatposition(positioninfront):
                    self.x += self.direction
                    # rise up to new ground level
                    self.y -= height
                    found = True

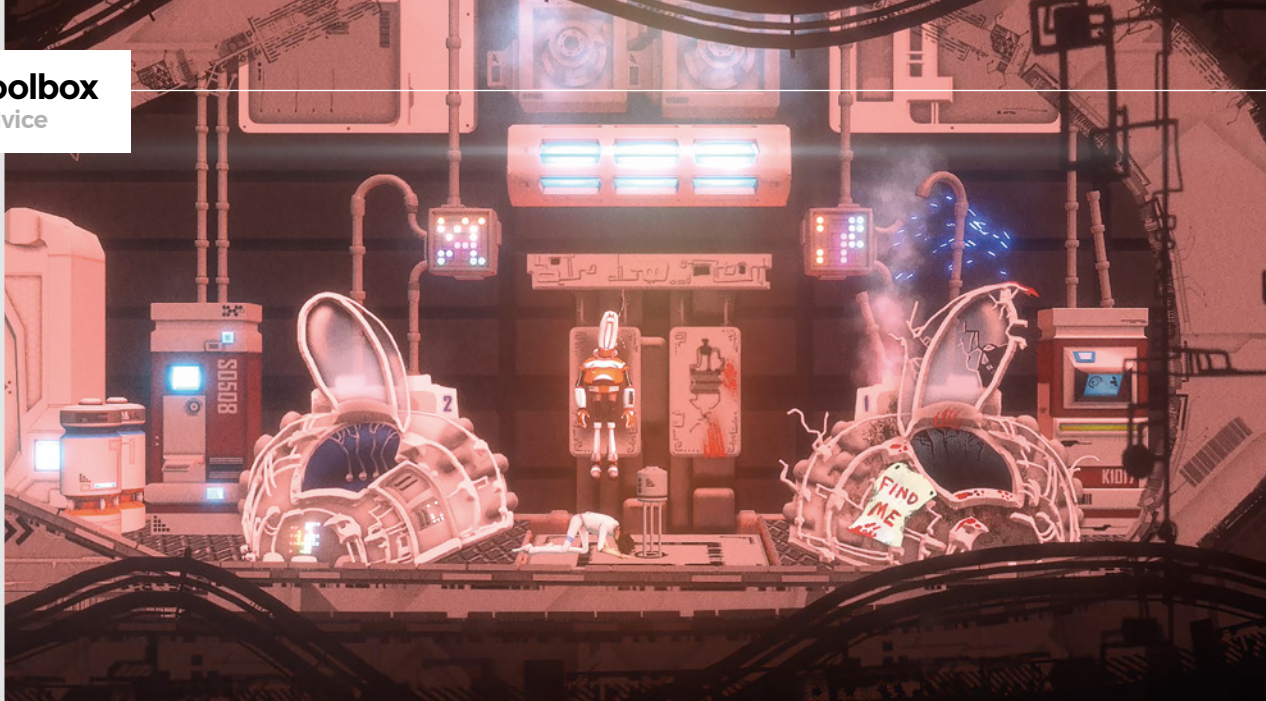
            height += 1
            # turn the lemming around if the ground in front
            # is too high to climb
            if not found:
                self.direction *= -1

    def update():
        global timer
        # increment the timer and create a new
        # lemming if the interval has passed
        timer += 0.1
        if timer > interval and len(lemmings) < max_lemmings:
            timer = 0
            lemmings.append(Lemming())
        # update each lemming's
        position in the level
        for i in lemmings:
            i.update()

    def draw():
        screen.clear()
        # draw the level
        screen.blit(level_image,(0,0))
        # draw lemmings
        for i in lemmings:
            i.draw()
```

✓ Sprites cling to the ground below them, navigating uneven terrain, and reversing direction when they hit an impassable obstacle.





▲ Marketing a game is hard. Sometimes I just want to crawl back into my cryo-sleep chamber after a day of social media management.



AUTHOR
JEFF SPOONHOWER

Jeff Spoonhower is a developer, artist, and college professor who's been working on triple-A and indie games for over 17 years.
anewthegame.com

Indie reflections: Making Anew Part 6

Developer Jeff Spoonhower shares a few useful approaches to marketing an indie game

The marketing of your game is of equal importance to its design and execution. Even if your game is fun, unique, and beautiful, it will likely fail to find an audience if it doesn't receive adequate exposure. Let's discuss some practical approaches to effective indie game marketing.

How do you find an audience for your game? How can you capture the attention of gamers, press, and content creators? As discussed in previous articles, it all starts with a game that looks, feels, and plays great, and contains unique features. Once you have a vertical slice or trailer for your game, you should plan and execute your initial marketing strategy. It takes time, patience, and research to effectively market a game.

Conceptually, marketing might seem easy. You create your website, post a trailer to your YouTube channel, set up a Twitter account, and you're ready! IGN comes knocking on your door, asking to write a feature about your game. Well, maybe not. The indie game marketplace is oversaturated, which means competition for attention is fierce. There's no guaranteed media coverage – even for experienced developers

working on their second or third project. Discoverability is one of the toughest challenges independent game developers face today.

You're probably part of a small development team, which means one of your team members will need to head up marketing. This is doable, but keep in mind, time spent on marketing means precious time away from development. If you can afford to hire a dedicated team member to focus on marketing responsibilities, do so. Be sure this person has some degree of marketing and social media savvy, intimately understands your game (and the overall gaming landscape), and has excellent communication and organisational skills.

TOOLS OF THE TRADE

There are many marketing tools available. Learning multiple marketing outlets can be stressful and overwhelming. Starting out, I suggest using these core tools: an official website, Twitter, and Discord.

To launch your website, first, register a domain and purchase a hosting package. When choosing your domain name, make sure it's short and easy to pronounce and spell. Lengthy, complex names are difficult to

▼ Discoverability – standing out from the crowd – is one of the toughest challenges facing indie devs today.





▲ If only it were this easy.

remember and will use too many characters in your Twitter posts. Begin with a base-level hosting package. WordPress is a popular and free way to build a clean, professional-looking website, and plugins and themes are available to customise your site. Hire a web and/or graphic designer to help if needed; it's worth the cost for your site to appear professional.

Twitter's essential for building awareness for your game and allows you to directly engage with an audience that's excited about your project. Building a following on Twitter won't happen overnight. In order to amass followers, likes, and retweets, you'll need to consistently post high-quality content from your game, such as screenshots, animated GIFs, short videos, and dev diaries. You're representing your game's brand and identity, so avoid posting anything political, religious, or personal in nature. Create colourful, high-contrast, attractive graphics for your banner and profile images, and keep the description simple yet informative.

Discord is an excellent site for building a community around your game. Gamers value direct interaction with developers, which Discord enables and encourages. You'll set up a #general channel to post development updates, promotions, and chat with folks about anything and everything. A #feedback channel is a good place to solicit design and feature ideas specific to your game. Consider a #bug-report channel, where your members can log and describe technical issues they run into when playing demos, betas, and your final game.

Other social media outlets such as Facebook, Instagram, Reddit, Twitch, IndieDB, and YouTube, can also be useful. Remember, managing these requires significant time and effort.

MARKETING ANEW

After developing *Anew* for about a year, we felt prepared to begin marketing. We first built our website (anewthegame.com) and embedded our YouTube trailer at the top. We wanted this to be the first thing visitors noticed. Directly below the trailer, we included essential facts about our game such as genre, unique gameplay features, story premise, and short bios of team members. Then, we added a gallery of screenshots from *Anew* that best represent

its gameplay, visuals, and tone. As we've been accepted into festivals and conventions, and won a few awards, we added a 'laurels' image toward the top of our site. This lends credibility to our production and informs visitors that *Anew* is worthy of their attention. Once our site was built, we compiled a list of gaming websites, streamers, and bloggers, and emailed them directly with an announcement about *Anew*.

Our approach to Twitter (@AnewTheGame) has been posting quality over quantity. Our highest-value tweets are animated GIFs, which we try to post every Friday – creating a fun and visually interesting six-second GIF takes a surprising amount of time and effort. We recently hired a social media manager to increase the regularity of these posts, which we hope will result in more followers. Thus far, we've built a modest following of people who are passionate about *Anew*. We've also connected with several website editors, streamers, and other industry partners through Twitter.

Our Discord server has become an essential community hub. We engage individually with our members, chat about the development process, gather feedback, collect bug reports, and run promos.

While we adore our loyal Facebook followers, our success on this platform has been disappointing. Our main frustration relates to shrinking organic reach, which refers to the percentage of followers that see our posts. Over time, this has dropped to ten percent or less: to reach more people, Facebook requires payment to convert posts into advertisements ('boosts'). This has become common practice, so many indie devs have abandoned Facebook in favour of other social media outlets.

Another effective way we marketed our game was through a crowdfunding campaign on Kickstarter – which is something I'll discuss further in a future article. Stay tuned! 🎮

“Marketing your game is of equal importance to its design”



Additional resources

There are a wealth of additional resources available online regarding indie game marketing. On YouTube and gamasutra.com, search for 'indie game marketing and PR tips' to learn more from experienced developers.

▼ Let's talk about how you can get more eyes on your indie game.

Directory

Make your own adventure game: a free online course

Learn object-oriented programming principles by creating your own text adventure game in Python

GET INVOLVED

Do you have an online tutorial you'd like to share with readers? Have you created an online resource that other game developers might find useful? Maybe you have a local code club you're keen to promote? If you have something you'd like to see featured in the Directory, get in touch with us at wfmag.cc/hello

What's the thinking behind the course?

Raspberry Pi's free online course will introduce you to the principles of object-oriented programming in Python, showing you how to create objects, functions, methods, and classes. You'll use what you learn to create your own text-based adventure game. You will have the chance to share your code with other learners, and see theirs.

If you're an educator, you'll also be able to develop ideas for using object-oriented programming in your classroom.

Who's it for?

People who are already familiar with Python programming and want to learn a different programming paradigm, understand and use existing libraries more effectively, or create code which is useful to other people. It will be particularly useful for A-level educators and students.

What will I learn?

By the end of the course, you'll be able to...

- Explore using objects in programming, and recognise the difference between a function and an object
- Understand how writing your own class allows you to combine functions and data
- Demonstrate extending other people's classes, including inheritance and polymorphism
- Produce a module to apply your learning of object-oriented programming
- Collaborate by sharing your code with other people

When's it on?

Every run of a course has a set start date, but you can join it and work through it after it starts. To find out more, and sign up, simply visit the course page at wfmag.cc/adventure-game

> Raspberry Pi's free online course will introduce you to the principles of programming in Python - and in the process, help you make your very own text adventure.





The UK's BRAND NEW FILM MAGAZINE

TRY
**THREE ISSUES
FOR £9.99**
with the code 'RASPBERRY'

THE LATEST RELEASES REVIEWED

FILM STORIES

A NEW FILM MAGAZINE, FROM THE CREATOR OF DEN OF GEEK

JACK & SARAH REVISITING AN OVERLOOKED 90S BRITISH HIT

CONFESSIONS OF A MOVIE PR REP

UNDERRATED MOVIE APOCALYPSES

PLUS ANNA SMITH, DEBBIE MOON, HOPE DICKSON LEACH, ROMESH RANGANATHAN, SIMON BREW

THE LATEST RELEASES REVIEWED

FILM STORIES

A NEW FILM MAGAZINE, FROM THE CREATOR OF DEN OF GEEK

EAST IS EAST, WILD WEST & REPRESENTATION

CONFESSIONS OF A CINEMA MANAGER

THE INCREDIBLE, OVERLOOKED BOX OFFICE RUN OF BETTE MIDLER

AUTISM IN THE MOVIES

FEATURING ROMESH RANGANATHAN, DEBBIE MOON, HOPE DICKSON LEACH, ANNA SMITH

ISSUE 3

FILM STORIES

HAS CINEMA GOT ITS FUNNYBONE BACK?

ILLNESS: ITS IMPACT ON HOW WE FEEL ABOUT FILMS

FIGHTING TALK

STEPHEN MERCHANT

REMI

2019

webscribe.co.uk/magazine/filmstories

Interface

Couch potatoes



Overcooked's chaotic brand of kitchen teamwork forces players to co-operate on delivering orders to hungry customers.



COUCH POTATOES

WRITTEN BY
JACK
YARWOOD

We look at some of the ways that developers are encouraging players to communicate in couch co-op games



W

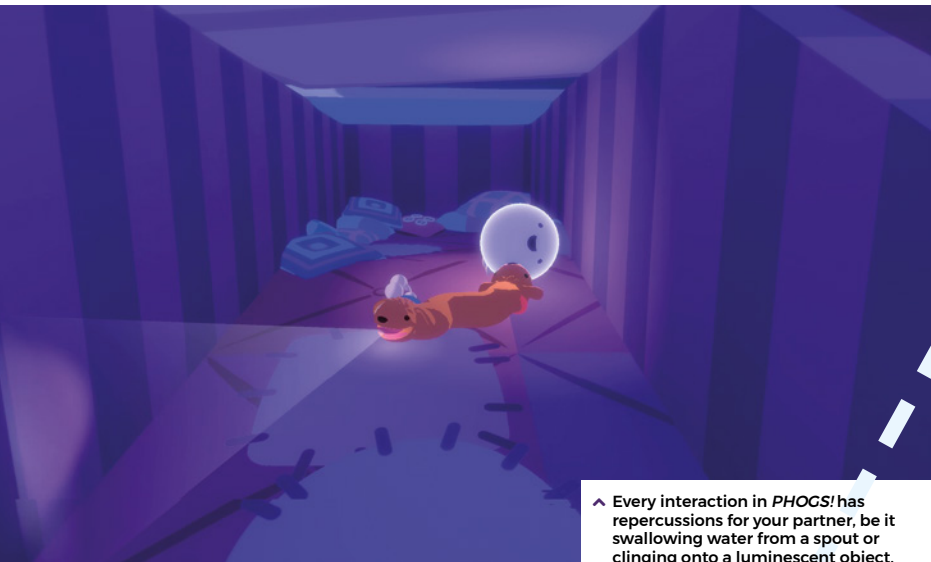
hile most social experiences in gaming nowadays are designed to happen online, with the aid of a hissing microphone, there's still a

wave of creators acting as staunch defenders of local co-op experiences. Studios like Ghost Town Games, Asteroid Base, Steel Crate Games, and Bit Loom Games all maintain that we, the people, play better together – and up close.

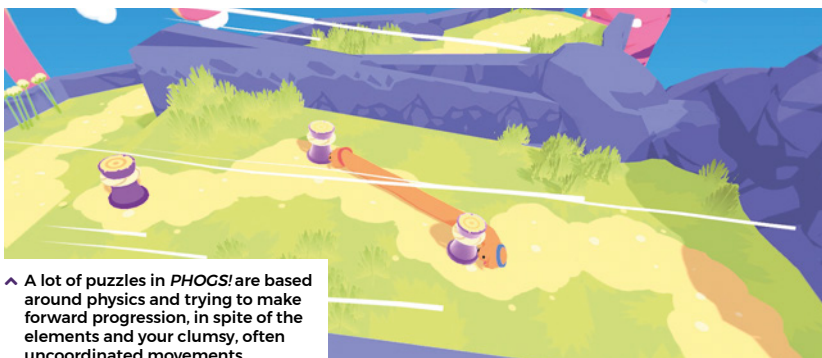
But what connects these studios' games isn't just the addition of a friend or family member in order to enjoy them to their utmost potential. It's also how their designs constantly force the player into situations where they need to communicate and coordinate with each other while occupying the same space in the real world. This is encouraged through a number of areas, like their control schemes, puzzle designs, or map layouts. Ghost Town Games' *Overcooked* series is an excellent example of this, with both games putting a huge emphasis on communication; players having to very clearly coordinate their movements around a kitchen to prepare dishes to hopefully achieve that coveted three-star rating.

"The origin for us was the co-operative angle, really, rather than the cooking thing," says Phil Duncan, co-founder at Ghost Town Games. "We used to meet up at lunchtimes when we worked at Frontier Developments, and we'd play whatever local multiplayer games we could get our hands on... I remember us talking about it and not really finding a game that fitted the kind of experience we were going for. Like the kind of game that was co-operative, but it required you to communicate and actually work together."

"There's a very limited pool of games to play, and you exhaust that pool quite quickly," adds Oli De-Vine, fellow co-founder at the studio. "Also, they're very combat-heavy and tend to be... like you're racing each other, and we just called this 'first-to-fun'. It's this idea that you are racing each other to actually get to the gameplay." ➔



^ Every interaction in *PHOGS!* has repercussions for your partner, be it swallowing water from a spout or clinging onto a luminescent object.



^ A lot of puzzles in *PHOGS!* are based around physics and trying to make forward progression, in spite of the elements and your clumsy, often uncoordinated movements.

KITCHEN FRICTION

A lot of specific design decisions went into *Overcooked* and its sequel in order to get players to communicate. The most notable of these are the orders, which players have to fulfil. Each recipe is random and requires just a few ingredients, but players are often confronted by more recipes than there are personnel. This means tasks need to be delegated, and at all times you have to be sure members of your team aren't making the same order twice, or wasting time on something irrelevant when they could be working on important tasks. Like washing the dishes. Seriously, it's important.

Another way *Ghost Town* achieves this enforced communication is through its map designs. Early on in development, the team found playtesters would often pick a role and stick to it. This meant that communication was limited, and characters were often acting as static worker drones. To solve the problem, the developers introduced dynamic environments

into the game – as well as time-sensitive obstacles like conveyor belts – to disrupt the player.

"We have some levels like where... the movement of the counters block players into sections," explains De-Vine. "And if they don't coordinate – 'OK you're going left, and I'm going right at this point' – they can both get stuck on the same side, then end up having to go some convoluted route, or in some levels they are just trapped there and have to wait until [they've] been unlocked again."

It sounds punitive and, frankly, it is. But it all weaves together the fine co-op tapestry that is the *Overcooked* series. Taken on face value, it might seem quite dull – barely a step up from classics from the archives like *Tapper* or *Burger Time* – but with these vaguely nefarious, 'forced' problems ladled on top, it's a recipe for wonderful, gorgeous, hilarious co-op disaster.

DOUBLE DOG

Another title similarly stressing the importance of working together is Bit Loom Games' upcoming *PHOGS!*, where two players are in control of a different dog head on the end of a single long, noodly body. Whereas *Overcooked* was all about taking an already complex process and gamifying it, *PHOGS!* focuses on taking the familiar task of guiding a 3D character through a level and complicating it further, splitting the work between two people.

"We spent an entire day throwing around ideas in a tiny, hot room, mashing words together until we latched on to something," says James Wood, director and programmer at Bit Loom Games. "The name 'dog sports' led us to countless silly scenarios, including one involving teammates sharing a controller in similar style to *Sportsfriends*. After some prototyping, we created the titular double-ended dog and shifted focus to co-operative gameplay rather than competitive. We're all big fans of co-op games like *Overcooked*, *Snipperclips*, and *BattleBlock Theater*, and wanted to see something new and a bit different."

Much like *Overcooked*, all obstacles in *PHOGS!* are designed around the idea of co-operation. For instance, the game features a monkey bar puzzle requiring one player to fasten themselves onto a pole and swing the other person/dog half across a gap. If the second player fails to

attach themselves securely to the other side before the first person lets go of their grip, then both players will simply collapse onto the floor, and they'll have to start all over again. Thus, players need to constantly be aware of what the other person is doing. Even movement requires players to work in tandem, to some degree – if each of the two heads is pulling in a different direction, the body will simply remain in the same place and achieve nothing.

To facilitate these kinds of co-operative mechanics, the developers had to simplify some of the tasks players would be taking part in. Hardcore platforming and parkour you'd see in other third-person titles went out the window and, in their place, Bit Loom created short, snappy challenges and other unique scenarios for the player to enjoy.

"We learned early on that navigation needed to be simple and easy," says Wood. "Adding any kind of challenge to the simple act of moving through a level was frustrating to new players. And due to its physics-heavy nature and that each player only controls half the character, precise platforming also never felt terribly satisfying. Consequently, we provide plenty of leeway during the more complex co-op scenarios, and make sure the platforming sections focus less on the challenge and more on the inherent silliness of a long wobbly dog."

It's not about the curse of 'git gud', and it's certainly not about punishing players for wanting to enjoy the game – it's more about the inherent silliness involved in *PHOGSI*. But to really make it something more than a wobbly dog joke, the challenge did have to be modified from what you might usually expect, and tailored to fit the specific circumstances of the game. Basically, you have to communicate more.

BOMB THREAT

One of the best demonstrations of a local co-op game forcing players to work together is definitely asymmetrical VR experience, *Keep Talking and Nobody Explodes*, from Steel Crate Games. Here, one person must wear a VR headset and enter a virtual room with a bomb inside it. They then have to describe certain details about the bomb – specific panels or symbols it features, for example – while their cohorts outside of the VR world feed back specific instructions on how to defuse it from a manual. The player in VR

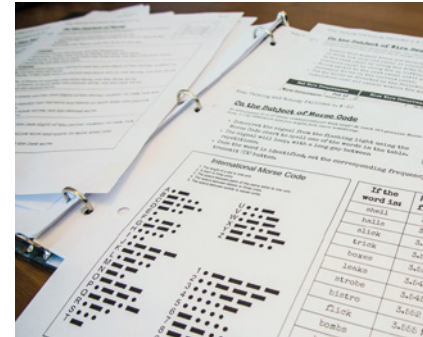
cannot see the manual, and the players outside of VR cannot see the bomb. If they fail to co-operate or just misunderstand each other, the bomb will explode, and the mission will fail.

"We came up with the idea at Global Game Jam 2014," says Taraneh Dohmer, communications lead at Steel Crate Games. "We were interested in the VR space. We noticed that playing VR with friends and family usually consists of one person wearing the headset, and everyone else waiting for their turn. We wanted to make it a more inclusive experience, and that's what sparked the idea initially. At its core, our game is about setting up fun scenarios that force people to communicate with each other – a concept that we refined throughout the development process."

"We spent an entire day throwing around ideas in a tiny, hot room"

The key to getting people communicating in *Keep Talking* are the puzzles, specifically the individual modules players have to figure out – and deactivate – through their co-operation. For this, playtesting was necessary in order to find out how exactly players were interacting and what specific behaviours could be encouraged through focused design.

"It allowed us to see where players were getting tripped up," says Dohmer about the team's experiences. "Each time we demoed our game, we gained more insight into what →



▲ The manual players are asked to pore over in *Keep Talking and Nobody Explodes* – proof that game ideas don't have to be technical to be great.

▼ Communication is key in *Keep Talking and Nobody Explodes* – and that's what makes it both hilarious and difficult.



Interface

Couch potatoes



^ *Overcooked 2* ratcheted everything up from the original, including how much players would shout at each other. JUST CHOP THE CUCUMBER!

interactions players were having the most fun with. Once we saw that communication was where the magic was happening, we focused on developing modules that forced that type of player interaction.

"The names of modules also reflect what aspect of communication they are trying to stress on you," she continues. "Memory' tests, well, your memory, and 'Who's on First' plays on the fact that you only have voice communication to [get across] visual information. It wasn't just about making the modules achievable, but ensuring that the process was fun to do."

"Having a smaller scope allows us to test stranger ideas faster"

One of the real masterstrokes in *Keep Talking and Nobody Explodes* is how the difficulty is carefully ratcheted up – starting out, you'll be swapping out who's in and out of VR, and the game slowly introduces new elements to take stock of and learn about. Were it a simple case of bomb 1: hard, bomb 2: harder, bomb 3: proper hard, the challenge would be off-putting in a multi-person situation. But it's considered in its approach, and is one of many elements that make this VR bomb disposal sim a genuine great in the co-op world.

TRIPLE-A SHYNESS

But what's interesting about this new wave of co-op games is that they are almost exclusively coming from the independent space. While bigger developers have largely shifted to

favouring online experiences and games as a service, these independent developers are able to make smaller games, covering subjects and mechanics that are of personal interest to those making them, thus satisfying niche areas that have mostly gone ignored. So why are indie developers the ones who are taking up the mantle? According to those we asked, it's mostly to do with basic elements such as cost and scale.

"We have the opportunity to make the games that we want to play ourselves," says Dohmer. "Having a smaller scope allows us to test stranger ideas faster. It gives us more flexibility that we may not otherwise have."

"I think part of it is like an economy of scale thing," adds De-Vine. "I think that games have inevitably got larger and larger teams, and therefore required larger and larger profits to maintain them. And I think it's a space that indies can occupy. It's this, 'No, we're going to assume that our player has somebody locally that they can play with and make an experience for them.' Whereas so many games have to tailor themselves around the idea that the single player has to be king, or you're going to be online and matchmake with people all over the world to support this experience."

While *Keep Talking and Nobody Explodes* and *Overcooked 2* can actually be played remotely, either through online modes or chat programs, the developers of these games maintain the best way to experience what they can offer in full is still local co-op. Being able to communicate using non-verbal cues and body language is something that can only be done in person, for example, and the ability to empathise more closely with another through proximity is something that both helps while you're playing, and raises the experience in your memory after the fact. The human element, you could call it.



"I think local co-op games provide that same feeling that you get from playing board games with your friends on a Friday night," says Dohmer. "Local co-op games scratch an itch for people who love to enjoy games with their friends in a social setting. Online play has many benefits, but it has its trade-offs, too. Our game is designed to create interaction between several human beings. With online play, you miss out on the raw emotional expression of your friends and their body language cues, and our game really shines in that situation. Even if you are not currently playing, you feel the tension and experience what's happening."

For *Overcooked 2*, the decision to add online play was in many ways one based on popular demand. After the success of the original game, *Ghost Town* had received numerous messages from people who loved the game, but could no longer play it locally with their family. So, with publisher Team17's help – and the sequel's higher budget – the experience was able to be introduced without altering the core design established in the previous game, and without diverting resources away from other key areas.

"We'd get messages from people saying, 'Oh, I love the game – we played it over Christmas, but my brother is serving overseas and we can't play this game together,'" says Duncan. "And we realised that, you know, there's a lot of people out there who will just never have that option to play it locally."

"Team17 also offered to help us out with a lot of the development aspects of *Overcooked 2*," adds De-Vine. "One of the things they did was take all of the online implementation out of our hands and just go, 'We'll do that.' And it's just like, 'Yeah, great', because that is a massive task."

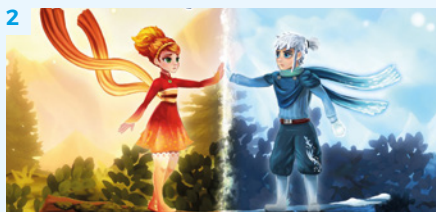
A big part of the appeal of these co-op games is the experiences they create. It's shouting frantic orders at your fellow chefs in *Overcooked* while chasing higher scores. Trying to synchronize your noodly dog to clear an obstacle in *PHOGS!*, and failing. Or desperately feeding information to your friends as the timer ticks down to zero in *Keep Talking and Nobody Explodes*. Though local co-operative games can feel hard to come by, this recent resurgence demonstrates exactly what was so endearing about them in the first place: creating shared goals to play through with friends and family. And shouting at each other when someone forgets to chop the cucumber. 🍷

5 MORE CO-OP EXPERIENCES FOR CONSOLES

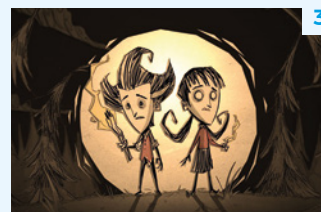
1



2



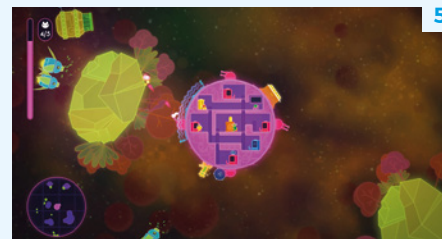
3



4



5



1. A Way Out

Play together with a friend as Leo and Vincent, two prisoners trying to escape from prison to get back at the person who put them there.

2. Degrees of Separation

Playing as the characters Ember and Rime, who have mastery over the elements of fire and ice respectively, you will have to work together and combine your abilities to make it through to the end of each level in *Degrees of Separation*.

3. Don't Starve Together

Bringing the terrifying survival experience to multiplayer, *Don't*

Starve Together lets players work locally as a team, delegating different chores and co-operating to fend off the creatures of the night.

4. Snipperclips Plus

Exclusive to Switch, *Snipperclips Plus* has you and a partner solve shape-based puzzles through the use of a simple yet ingenious snipping mechanic.

5. Lovers in a Dangerous Spacetime

Up to four friends can play together in *Lovers in a Dangerous Spacetime*, with each player responsible for one or more aspects of their spaceship.



Developer Profile

HAL Laboratory

The Japanese developer survived its darkest hour, and gave the world Kirby, Smash Bros., and more

In another, darker version of reality, HAL Laboratory might have shuffled off this mortal coil long before it had the chance to create some of its best-known and enduring games. By 1991, the Japanese publisher and developer was already a decade old, and the cracks were beginning to show in its edifice; game sales were slowing, and the catastrophic failure of an ambitious (and expensive to produce) RPG named *Metal Slader Glory* threatened to bring the entire company to its knees.

Fortunately, Nintendo stepped in to rescue the firm from bankruptcy – which meant that we got the likes of *Kirby*,

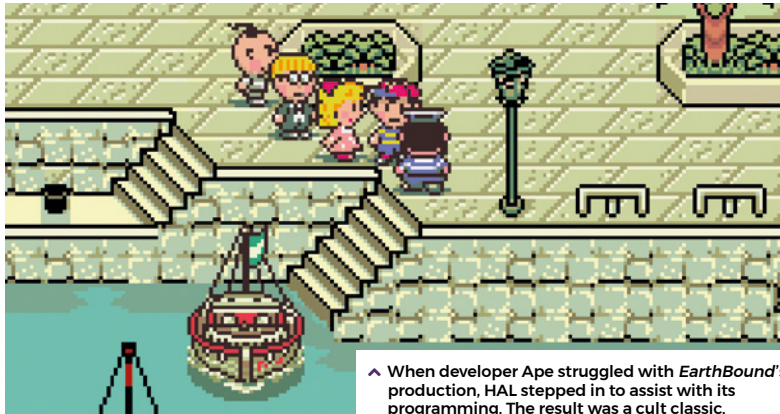
Smash Bros., and *EarthBound* (the latter co-developed with Ape); all games that emerged in the early nineties, and still highly regarded all these years later.

Even before that financial wobble, HAL Laboratory – founded in Tokyo by Mitsuhiro Ikeda in 1980 – enjoyed close links with Nintendo. Future Nintendo president Satoru Iwata famously worked at HAL while still a computer science student, and when he joined HAL full-time after leaving university in the early eighties, programmed several games for Nintendo's then-new Family Computer system, later released as the NES in the rest of the world: although they bore Nintendo's name, *Golf*, *Pinball*, *Balloon*

^ HAL "Aim for love at first sight" when designing their games. It's plain to see in the *Kirby* series, still going strong after 27 years.

Fight and *F-1 Race* were all programmed by Iwata at HAL.

There was a good reason for HAL's programming expertise when it came to the Famicom; while still at university, Iwata had already developed several games for the Commodore PET, a comparatively obscure piece of hardware in Japan, but one that shared the same 6502 CPU as Nintendo's later Famicom. This meant that, while rival firms were still getting their heads around the hardware when the



▲ When developer Ape struggled with *EarthBound*'s production, HAL stepped in to assist with its programming. The result was a cult classic.

Famicom emerged in 1983, Iwata (and by extension, HAL) was already adept at programming for it.

SMASH HITS

Bolstered by its reputation for technically polished work, HAL's growth continued through the eighties, as it steadily put out assorted golf games, original titles (the likeable *Eggerland* series of block-pushing puzzlers), adapted arcade

when it came to game development.

It was in this rejuvenated climate that 19-year-old graduate Masahiro Sakurai joined HAL, and began working on what would become *Kirby's Dream Land*: released in 1992, the gentle, pastel-coloured platformer was an unexpected success, spawning an entire franchise of distinctly kawaii sequels, spin-offs, a cartoon series, and assorted merchandise. With *Kirby*,

“HAL's games are marked out by their bold design, accessibility, and warmth”

games for home consoles (*Defender II*, *Millipede*), and published games from other developers (like *Kabuki: Quantum Fighter*, created by Human Entertainment). HAL's near-bankruptcy in the early nineties, however, saw the studio rethink its strategy; Satoru Iwata took over as president, its publishing arm was closed, and the firm began taking a 'quality over quantity' approach

Sakurai resolved to go against the grain of other platformers, with their one-touch deaths and precisely timed jumps; instead, he wanted to make an approachable take on the genre that players of any age could play. The same philosophy arguably informed Sakurai's next big success, *Super Smash Bros.* – a multiplayer brawler designed to entice newcomers as well as hardcore players.



HAL LABORATORY, INC.

Dogs' eggs? HAL's logo explained

While the meaning behind HAL Laboratory's name is more easily understood – taken from the sentient computer in the film *2001: A Space Odyssey*, HAL is one letter removed from IBM – the company's logo is rather cryptic. Why does it feature a dog incubating eggs? Speaking to Forbes, HAL's director Satoshi Mitsuahara explained that the 'Inutamago' logo (a portmanteau of the Japanese words for 'dog' and 'egg') is all to do with surprise and creativity.

“Our 'Inutamago' logo is quite symbolic because the dog is a mammal and doesn't lay eggs,” Mitsuahara said. “However, it is looking after these eggs, and that means you don't really know what is inside those eggs. That implies that whatever comes out of these eggs is completely unknown and utterly surprising. That's where the inspiration for the logo is from, in that HAL Laboratory is a company that will surprise people and creates something unimaginable.” It seems obvious, really, put like that.



▲ Nintendo's Shigeru Miyamoto initially resisted HAL's crossover concept for *Smash Bros.*



▲ The late Satoru Iwata went on to greater fame at Nintendo.



▲ HAL Laboratory's current president, Shigefumi Kawase.

Sakurai left HAL in 2004, apparently because he was afraid of getting stuck in a creative rut of churning out sequels to these hit titles – though ironically, he continued directing *Smash* games at his own studio, Sora.

For almost 40 years, HAL Laboratory has successfully navigated a changing Japanese games industry. Successive presidents, including Masayoshi Tanimura, who took over from Satoru Iwata when he headed to Nintendo, and current head honcho Shigefumi Kawase, have managed to maintain a modest yet distinct studio spirit. HAL's games, whether they're *Kirby* platformers or downloadable puzzlers like this year's *BoxBoy! + BoxGirl!*, are marked out by their bold design, accessibility, and warmth. As Kawase sums all this up on HAL's website, “With care and love, we make our products one at a time for you, our customer. We bring you happiness through our creations, and that becomes our happiness, too.” 🐶

HAL of Fame

10 highlights from the Lab

A selection of HAL Lab's prime cuts from the past four decades

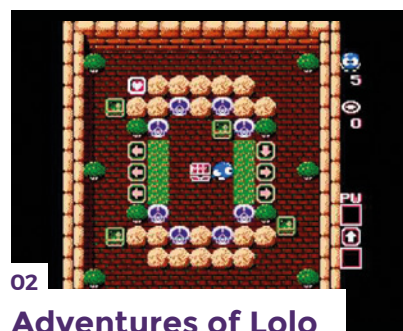


01

Golf

NES – 1984

It might not look like much now, but *Golf* was quite a programming feat in its day: Satoru Iwata managed to cram an entire 18-hole course into just a few kB of memory – something rival developers had attempted and failed on the NES. HAL's reputation for its technical prowess began here, as did a string of other golf games from the firm: see also *Kirby's Dream Course*.



02

Adventures of Lolo

NES – 1989

A block-pushing puzzler, *Adventures of Lolo* balances deviously intricate stage designs – all switches, locked doors, and barriers – with sweaty-palmed action, as enemies pursue you like relentless killer cyborgs. A surprise hit, the series – known as *Eggerland* – was even bigger in Japan, with around a dozen games released across multiple platforms.



03

Trax

Game Boy – 1989

Had this top-down shooter been released a few years later, it could have been marketed as a *Kirby* spin-off: its rotund tank looks uncannily like the pink hero (albeit with a gun turret attached), and the game's general tone is light and cartoon-like. Although it's short at just four levels, it's still one of the Game Boy's more entertaining action titles.

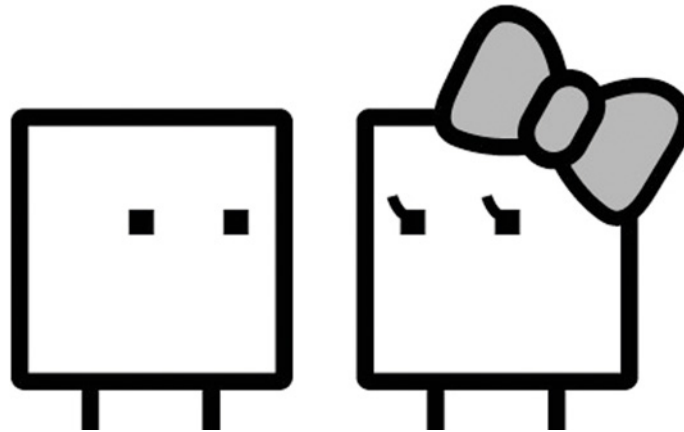


04

Metal Slader Glory

NES – 1991

Leaving aside its potentially ruinous sales – the carts were expensive to produce, and legend has it that the game barely shifted enough copies to cover its advertising – *Metal Slader Glory* was still a bold, expansive, and refreshingly different RPG, bringing a human angle to its sci-fi yarn that was relatively unusual on console adventures at the time.

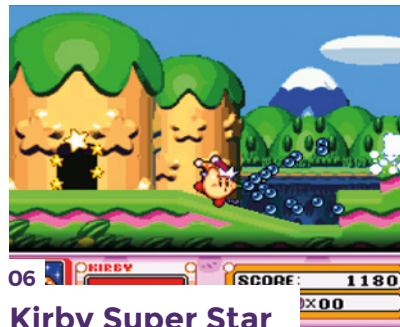


05

EarthBound

SNES / GBA – 1994

Co-developed with Ape, this legendarily eccentric gem needs little introduction. Offbeat where most mainstream RPGs stuck rigidly to fantasy or sci-fi genre staples, and packed with charming characters and unforgettable story moments, *EarthBound* is more than deserving of its classic status. Now, if we could only get an official translation of its sequel, *Mother 3*...



06

Kirby Super Star

SNES – 1996

For our money, the finest entry in the *Kirby* series so far: the standard formula of platforming and enemy inhalation is joined by a wealth of imaginative sub-games of varying sizes: there are races, time trials, a boss rush mode, and twitch-based minigames. The sheer variety – and pixel art craft – on display here is pretty astonishing.



07

Pokémon Snap

N64 – 1999

Sure, it's a licensed title, but there's a surprising amount of thoughtful design in *Pokémon Snap*. In essence, it's a rail shooter, except you're photographing monsters rather than blasting them out of existence. Regrettably, it's no longer possible to have your best pictures printed out as stickers at your local Blockbuster outlet. The core game remains a cute N64 highlight.

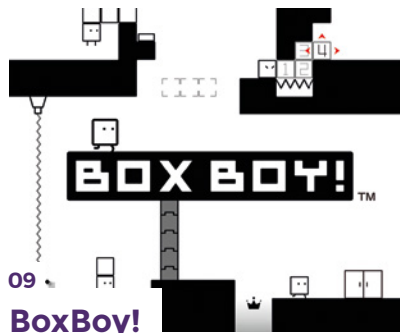


08

Super Smash Bros. Brawl

Wii – 2008

The brawler series went online for the first time with this Wii entry, and while matching with online opponents could be shaky at the best of times, it was still a light and enormously entertaining button-masher. Later entries (developed outside HAL) would, of course, improve the formula further, culminating with last year's *Super Smash Bros. Ultimate*.



09

BoxBoy!

Nintendo 3DS – 2015

What's so impressive about *BoxBoy* – and its sequels, including this year's *BoxBoy! + BoxGirl!* on the Switch – is how imaginatively it uses its mechanics. Levels are traversed and puzzles solved via its hero's ability to extend clones of itself in cardinal directions, like a blocky snake. From this, HAL manages to forge a varied and absorbing platform-puzzler.



10

Part Time UFO

Android / iOS – 2018

Created by spin-off company HAL Egg, *Part Time UFO* is a beguiling yet infuriatingly addictive smartphone title. Your task is to pick up objects and stack them in a predefined order using a fiddly robot hand that functions like one of those mechanical grabber machines you get in arcades. Trust us, it's far more fun – and witty – than it might initially sound.

Subscribe today



SAVE
49%

wfmag.cc/subscribe

13 issues for just £20

Subscriber benefits

- > **Free delivery**
Get it fast and for free
- > **Exclusive offers**
Great gifts, offers, and discounts
- > **Great savings**
Save up to 49% compared to stores

Introductory offer

Rolling monthly sub

- > **Low initial cost** (from £4)
- > **Cancel at any time**
- > **Free delivery to your door**
- > **Available worldwide**

Subscribe for 12 months

Receive all 26 issues

£40 (UK) **£75** (USA)
£65 (EU) **£75** (RoW)

Offers and prices are subject to change at any time



Digital subscriptions from

£1.99



Visit wfmag.cc/subscribe or call **01293 312192** to order

Subscription queries: wireframe@subscriptionhelpline.co.uk

Info

GENRE
Adventure
FORMAT
PC (tested) / XBO
DEVELOPER
Mobius Digital
PUBLISHER
Annapurna
Interactive
PRICE
£19.99
RELEASE
Out now

REVIEWED BY
Malindy Hetfeld

HIGHLIGHT

After a long time alone, it can feel great to find one of the other travellers camping out on the various planets. They're always good for a chat and a valuable source of hints, too. You can find them by following the sound of their instruments across the solar system.

▼ *Outer Wilds* doles out information slowly, and with little hand-holding.



Outer Wilds

Death and translation in the final frontier

The first thing you see in *Outer Wilds* are planets. You open your eyes and there they are, twinkling in the night sky like the stars that surround them. Today is your big day – you're going to leave your home planet Timber Hearth and its four-eyed inhabitants behind for the first time. Others like you have left and gone to chart the stars for decades, but your people are particularly fascinated by the Nomai, an ancient alien race that has left traces all over *Outer Wilds'* small solar system. You have a better chance of finding out what the Nomai were all about than anyone before you, thanks to a portable translation device allowing you to immediately make sense of Nomai writing no matter where you find it. And so, equipped with a number of hints on where to start your investigation and a ship that has frankly seen better days, you set off.

As a game about exploration, *Outer Wilds* encourages you to, well, explore, and doesn't tell you much. On Timber Hearth, you can get to know your tools – how to locate signals with a tracking device, get a feeling for moving around in zero-G in your space suit, and practice landing your ship with a tiny spaceship model

that honestly has *nothing* on the real thing. Even with this quasi-tutorial under your belt, *Outer Wilds* will be confusing for a while as you fiddle your way onto your first planet. There's a not inconsiderable chance you will literally and figuratively bounce off the physics in this game, but stick with it – you'll soon get a feel for how everything handles. I chose Giant's Deep as my first destination, a planet fantastically unsuitable to make your first landing on, because most of its surface is water. In true video game fashion, I opened my ship's hatch to see how long I could swim for, which turned out not to be very long, and died.

That's how I found out about *Outer Wilds'* loop. It turns out you can't die without starting where it all began, *Groundhog Day*-style. But while everything around you resets, your memory stays intact. You die exactly every 22

▼ Space Fish doesn't want to be disturbed. We will disturb him.





^ It's always nice to meet a fellow traveller.

minutes in a manner I won't spoil for you if you haven't heard about it yet, but until then, the solar system is your oyster. In the face of games like *No Man's Sky* and its endless universe, a system of six planets doesn't sound like much to explore, but there's astounding depth to *Outer Wilds* that makes every bit of progress feel like a revelation. My first translation felt like an enormous find, because finally I was able to hear the Nomai, rather than hear about them, and instead of speaking in riddles, they discussed their work and their findings in a manner that was refreshingly normal. Uncovering more translations didn't make me revere that mysterious civilisation, it was more like checking in on what my pals the Nomai were up to; it's a unique approach with a completely different tone to most other exploration games.

Even small successes, like landing your rickety ship without breaking something or discovering a good deal of leads in a single time loop, feel really good – your ship logs your progress for you, including new rumours and locations, and I watched the log grow with a satisfaction bordering on smugness. To turn rumours into finds, you need to employ a true explorer's mindset, since *Outer Wilds* never goes out of its way to disclose a location. It doesn't even describe what exactly you're looking for most of the time.

Each planet is a distinct entity in every way. From its landscape to its gravity, no planet quite feels like the other, and each is continuously on its way around the sun. Their relationship to one another, as well as to the sun, can lead to new discoveries if you time it right, which is a great way to make use of the 22-minute loop. The icy crust of a planet called The Interloper, for example, will melt when the planet gets close to the sun, allowing you to access the caves beneath. Another symbiosis also leads to one of my more memorable deaths – two planets called Ash and Ember share a gravitational field and a

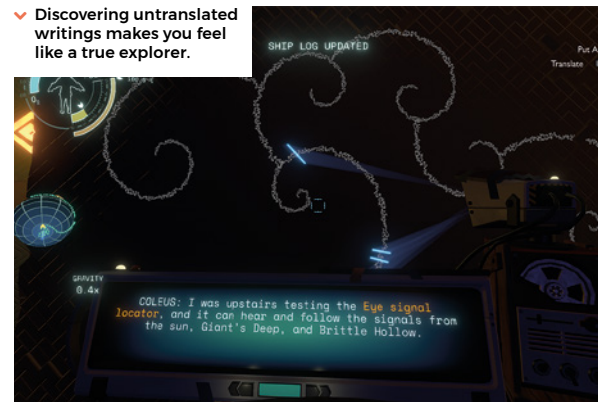
lot of sand, which gave them the name Hourglass Twins. A badly-timed jump with my jetpack left me stuck in one of Ember's crevices, where the sand pulled in from Ash slowly drowned me.

Outer Wilds isn't morbid or unfair, but it does ask you to take risks in the name of exploration, and you can go through a frustrating amount of loops before a particular jump works out or you have the planet memorised enough to be able to efficiently go about your business. The time loop did cause me unwanted

tension, if rarely so, making me aware that after a crooked landing and orienting myself, only so much time remained for actual exploration.

More often, it was the need for jetpack fuel or oxygen that ended an excursion prematurely, or hitting my head during a jump. While I understand the need for some realism and challenge, these elements did hamper my enjoyment. Nevertheless, the palpable sense of progression and the beautiful way in which *Outer Wilds* builds and rewards curiosity kept me going to discover a solar system – and a people – rich with character. 🗨

v Discovering untranslated writings makes you feel like a true explorer.



“The way *Outer Wilds* rewards curiosity kept me going”

VERDICT

A beautiful but occasionally frustrating gem, cleverly playing with time and hiding many secrets.

80%



^ Every aspect of the game is rendered in pleasing detail.

Rated
Review

HIGHLIGHT

Blood & Truth's level of detail is impressive up close, and you're never too far away from an interactive object, whether that's a vape pen with a variety of flavours, a CCTV system, or a record to scratch while doing your best Revolver Ocelot impression with your free hand.

Review

Blood & Truth

Explosions are plentiful in *Blood & Truth*, while bullet time affords you a few precious seconds to nail satisfying headshots.

Lock, stock and two smoking move controllers

Info

GENRE
FPS

FORMAT
PSVR (tested)

DEVELOPER
SIE London
Studio

PUBLISHER
Sony
Interactive
Entertainment

PRICE
£34.99

RELEASE
Out now

REVIEWED BY
Jordan Oloman

VERDICT

A hectic romp through London's criminal underbelly, *Blood & Truth* is PSVR at its cinematic best.

83%

Blood & Truth is a bare-faced homage to the movies of Guy Ritchie, a guns-blazing power fantasy teeming with male ego. You step into the Jacamo dress shoes of Ryan Marks, an elite army veteran out for blood when a potty-mouthed Nigel Farage lookalike seizes a crime family power vacuum. It's by the book stuff, but we've not seen anything like it in games since the days of *The Getaway*.

The novelty of the cinematic genre doesn't wear thin across the game's four- to six-hour story mode, which is packed with enough production value and adrenaline-pumping set pieces to keep you absorbed. There's a lot of satisfying pay-off in *Blood & Truth*, both through physical actions and narrative build-up. Antagonists are set up just as well as the C4 you rig at the start of one mission, only to let it blow at the bombastic crescendo of the next.

And while a lot of the on-rails shooting boils down to blowing up red canisters and spongy goons, it's consistently frenetic fun. Squinting to get the perfect headshot as you hang from the monkey bar scaffolding of a London tower block is euphoric escapism – *Blood & Truth* is always trying to up the ante with its gunplay by throwing dangerous situations at the player and toying with expectations.

It's best played at your most energetic for this reason – when you're awake enough to duck and dive into cover and channel the holy spirit of Jason Statham. It's most surprising

innovation is in making the minutiae of action VR haptic and fun, from picking locks and swapping mags to clambering through vents with your sweaty palms.

Unfortunately, *Blood & Truth* is harangued by the ancient peripherals it has to still rely on. The PS Camera and accompanying Move controllers are begging for an upgrade, and it shows. Tracking can often go haywire in the middle of a firefight, and the clunky size of the controllers means that you get in your own way when you're trying to jam a magazine in the bottom of a pistol or switch between precarious handholds. With its cinematic inspirations, it's a shame the immersion has to be broken so often – a few moments of fuzzy AI forced me to crane my neck to find pesky bugged goons, who were busy watching paint dry.

Soundtracking your 15 minutes of action hero fame is a clever mix of orchestra and grime which – in its finest moments – achieves *Baby Driver*-esque heights of soundtracked chaos, as the crunch of your double-barrel shotgun sends a shellsuited hoodlum hurtling towards a garage door. *Blood & Truth* isn't just a VR system seller; it's proof that virtual reality can deliver first-party cinematic set pieces with tactile flair. Praise goes to the voice acting and performance capture here too, from tiny tidbits like table-tapping interrogators and the endearing gait of your delinquent brother to some genuinely funny one-liners, the game is a box-office blast that is well worth the ticket price. **W**

“Proof that VR can deliver first-party cinematic set pieces”

HIGHLIGHT

Trover and the Chairorpien travel the world in a spaceship filled with little details. In one corner there's a basketball hoop and balled-up paper to shoot, which gives you something to do while the characters witter on. A time-waster, yes, but there's a trophy for shooting 100.

▲ The game's wacky story beats give some insight into Roiland's mind.

Review

Trover Saves the Universe

A crass cartoon caper for canine companions

It begins with your dogs being stolen. No, not just stolen. A giant alien with empty eye sockets swoops in to dognap your two fluffy puppies and use them as eyes. Reader, my jaw hit the floor.

This is, of course, all part of the game's absurd cartoon humour. *Trover Saves the Universe* comes from Justin Roiland, best known as the co-creator of TV's *Rick and Morty*. Your enjoyment of that will likely reflect your enjoyment of this game.

And that's not just for its multiple references to the show. Roiland voices titular Trover, and the script is full of his trademark puerile humour, with all the swearing and testicle jokes you can stomach. Better still are the gaming references and cheeky comments about your ability to play the game – jokes that are at least wittier than having faeces flung at your face (which genuinely happens).

But boy does Roiland like to talk, even if it is to cover up loading times. What begins as amusing soon grates as Trover interrupts almost every action with some sort of quip, tirelessly narrating when you just want some time to consider a puzzle. There's even a character called Comedy Guy; if you tell another character you don't

find him funny, you're berated. It's not hard to imagine Roiland himself doing the same thing.

The game does give you a vibrant cartoon world to explore. Your journey to save the universe (and your dogs) takes you across multiple themed planets with bizarre characters and set pieces. Played in VR, it's genuinely immersive, and your perception is rewarded as you discover hidden power babies – used to increase health – off the beaten path.

In fact, the use of VR is cleverly done. There's a narrative reason for it: you're not actually playing as the titular, Morph-like eye-hole monster, but a 'Chairorpien' who controls Trover using a conspicuously shaped controller. This allows you to teleport around the world at set points, reducing motion sickness, and allowing for some fourth-wall-breaking jokes. It also explains all the characters with monsters in their eye-holes.

Strip away the comedy and the headset, though, and you're left with a simplistic experience. Combat sees Trover whacking enemies with a laser sword as you mindlessly button-bash. Puzzles are amusingly weird, if not exactly taxing, and platforming is only challenging thanks to the awkward camera angles and sometimes finicky controls.

Trover Saves the Universe is certainly a unique experience, and short enough to enjoy over a weekend at a relaxed pace. In some ways, it's the *Conker's Bad Fur Day* of VR, but without the engaging, well-designed mechanics of Rare's game to go along with the silly, prepubescent humour. And worst of all? You can't even pet the dogs. 🐾

Info

GENRE
Platformer
FORMAT
PSVR (tested) / PC
DEVELOPER
Squanch Games
PUBLISHER
Squanch Games
PRICE
£29.99
RELEASE
Out now

REVIEWED BY
Ed Nightingale

VERDICT

Love or hate Roiland's humour, it certainly adds character to this VR adventure's simplistic mechanics.

59%

✓ **Flesh World** is a grotesque land of nipple switches, anus doors, and stomach acid pools – typical of the game's humour.



Rated
Review



When tracking suspects, always be ready to duck into cover and blend in seamlessly to your surroundings.



Review

HIGHLIGHT

Judgment offers plenty of minigames to enjoy, including a selection of Sega arcade classics. The highlight, however, is drone racing, which sees you flying through Grand Prix events above the busy streets. Fine control, tight course design, and extensive customisation options make it an involving diversion.

Yagami has two fighting styles and can launch attacks by kicking off walls. Or, just smash opponents over the head with a bicycle.

Judgment

Would a Yakuza by any other name smell as sweet?

Info

GENRE

Open World / Action

FORMAT

PS4 (tested)

DEVELOPER

Ryu Ga
Gotoku Studio

PUBLISHER

Sega

PRICE

£49.99

RELEASE

Out now

REVIEWED BY

Jon Bailes

VERDICT

An enjoyable expansion of the *Yakuza* universe, but a missed opportunity to break new ground.

66%

W

elcome to Kamurocho. Again. *Judgment* offers a familiar toddle around the locales of Sega's *Yakuza* series, though this time some of the attractions are new. It's a spin-off that shifts perspective to the right side of the law, but otherwise sticks to the old routines.

If anything, protagonist Takayuki Yagami, an ex-lawyer turned PI, is a more natural fit for the formula. His job brings him close to serious crime and gangland politics while providing a stream of everyday requests that pay the bills. It also allows the game to mix up the usual bouts of raucous street brawling with numerous detection modes – trailing or chasing a suspect, drone surveillance, hunting for clues, infiltration, interrogations, and so on. And it helps maintain the series' trademark tonal duality, switching between the ultra-macho melodrama of big cases and the comic tribulations of ordinary city life.

At the same time, focusing on Yagami's occupation does highlight the fact that – despite the thrills and the laughs – *Judgment* can feel laborious. When you break down what you actually do to advance the story, solve cases, or complete 'friend events', there's often a ton of busywork. One character makes a joke about fetch quests, but it doesn't alter the reality that you're *doing fetch quests*. Side quests play out with you doing little of note, or involve activities that are mechanically sound but barely engaging. Even most fights demand little attention.

But *Judgment* gets away with a lot due to its pace and variety. The *Phoenix Wright*-style case building is rudimentary, but creates momentum, and it's hard to resent the lack of depth in each activity when you're doing something different a minute later. You might find yourself sucked into a side case en route to the next major plot point, then stop for a game of darts, get into a punch-up, upgrade your skills, go to a café, and make a new friend while you're there. The mass of always available distractions helps obscure the banality of running errands.

The game's other winning ingredient is that it retains *Yakuza*'s unique narrative style. Minor NPC requests often stand out, being so charmingly goofy that encounters feel worthwhile even when your input is limited. As for the main story, while it's certainly too long for the game that supports it, the legal wrangling adds freshness, the support cast is strong, and no matter how preposterous it gets, it manages to stay compelling.

What remains conspicuously absent, however, is any form of boundary-pushing. There's a lot of old ground re-covered here, and the new game elements are mainly superficial and unadventurous. Plus, behind the schoolboy humour and knowing winks, *Judgment* remains resolutely conservative in its ideas and themes, especially when it comes to gender roles.

There's still nowhere else in gaming quite like Kamurocho, but even as it changes it feels frozen in time. *Judgment* might have tried some different avenues of inquiry. 🗿

HIGHLIGHT

Smile For Me features an interesting mechanic, where responding to conversations is done by liberally wiggling the mouse left to right to shake your head, or pushing up and down to nod, which advances conversations with the residents of The Habitat and tethers you to the characters, forcing the player to be involved with the dialogue.



▲ There aren't many environments in the game, but they're full of character and unique details.

Review

Smile For Me

It might never happen

Smile For Me is about cheering people up by any means necessary. And let's be honest, we could all do with more of that. The game takes place in The Habitat, a wellness resort where, in a place of institutional apathy, you're tasked with turning frowns upside down. It's a 3D point-and-click game imbued with the spirit of rebellion: you walk around finding items and solving puzzles to enable the happiness of others, even as a surreal and worrying undercurrent pervades the world.

This is underlined by the juxtaposing art styles, where hand-drawn NPCs roam a 3D world. You'll also encounter puppets and doodle creatures, but if you interact with the environment, you realise your hands look realistic and human.

Acoustic guitars and synths layer the experience with a palpable ambience, evocative of Stewart Copeland's work on *Spyro's* more dreamlike worlds. The NPCs' speech is a mix of *Twin Peaks* and *Banjo-Kazooie*, with garbled noises supplementing conversation. It's unsettling, but wonderfully atmospheric.

The writing is perhaps this game's finest feature – a varied cast delivers true emotional range via dialogue full of onomatopoeia and formatted style, giving each happiness-starved inmate a memorable sense of self. It'd be dastardly to spoil its magic, but *Smile For Me* is packed with wit and substance, as well as fantastic irreverent humour akin to *Undertale*.

The game starts off as lighthearted fun, but you're not even settling in before the evil Dr Habit pops up to remind you that there's something sinister going on behind the scenes. There's a "strict beddy-time," he says, ominously. The game's other characters, including assorted paper creatures who flail and stare, also serve as a stark reminder that something's not quite right in The Habitat.

Whereas most games only afford you the ability to hurt other people in pursuit of endorphins, *Smile For Me* flips this on its head, and makes a puzzle out of creating happiness. It's about the role we play in the lives of others, and how small errands and thoughtfulness can turn the tide of the most pressing internal conflicts. *Smile For Me* had such an impact on me that I felt compelled to reach out to some of my friends and make sure they were OK – which isn't something we can say about most video games.

Unfortunately, the game isn't very long – it took me around six hours to wrap it up, with some head-scratching moments relating to the item puzzles. Yet, to be honest, I think if it was any longer, the pacing would fall apart. *Smile for Me* does a fantastic job of keeping you curious about the strange world it resides in via a clever drip-feed of new information at every turn – and the pay-off is oh-so-sweet. It's one you should pick up if you value thoughtful, memorable games that stick with you far longer than you might otherwise expect. 🗨

"It's about the role we play in the lives of others, and how thoughtfulness can turn the tide"

Info

GENRE
Adventure

FORMAT
PC (tested)

DEVELOPER
Gabe Lane / Yugo Limbo

PUBLISHER
LimboLane

PRICE
£10.29

RELEASE
Out now

REVIEWED BY
Jordan Oloman

VERDICT

A surreal, often melancholy charmer with a sinister underbelly, *Smile For Me* is a tangled mystery worth unravelling.

75%



Review

Super Mario Maker 2

Info

GENRE
Platformer /
maker-'em-up

FORMAT
Switch (tested)

DEVELOPER
Nintendo EPD

PUBLISHER
Nintendo

PRICE
£44.99

RELEASE
Out now

Making a Mario

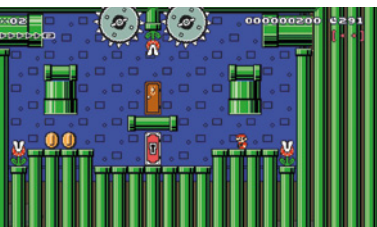
In *Super Mario Maker 2*'s story mode, players are given 100 levels that Nintendo EPD's internal team has created using the tools available to everyone over in the course creator. Very few of the levels here feel like traditional *Mario* experiences – instead, they're designed to work as examples of what you can go and create yourself, showing off how levels in *Super Mario Maker 2* can challenge you to complete interesting puzzles, or build levels based around singular unique gimmicks that use the tools in interesting ways.

In one level, for instance, you need to get keys to unlock doors across a series of screens by tricking cranes on an upper level into grabbing and dropping Goombas into certain spots that you can't reach. The cranes will grab or drop objects if Mario is standing below them, so it's all about timing your movements, with no traditional platforming involved. In another, Mario and Yoshi are dropped down a long low-gravity tunnel, and you need to take out as many Cheep-Cheeps as you can on the way down. It's up to you if you equip Mario with a Fire Flower for ranged attacks or a cape so that you can bonk them on the head as you go.

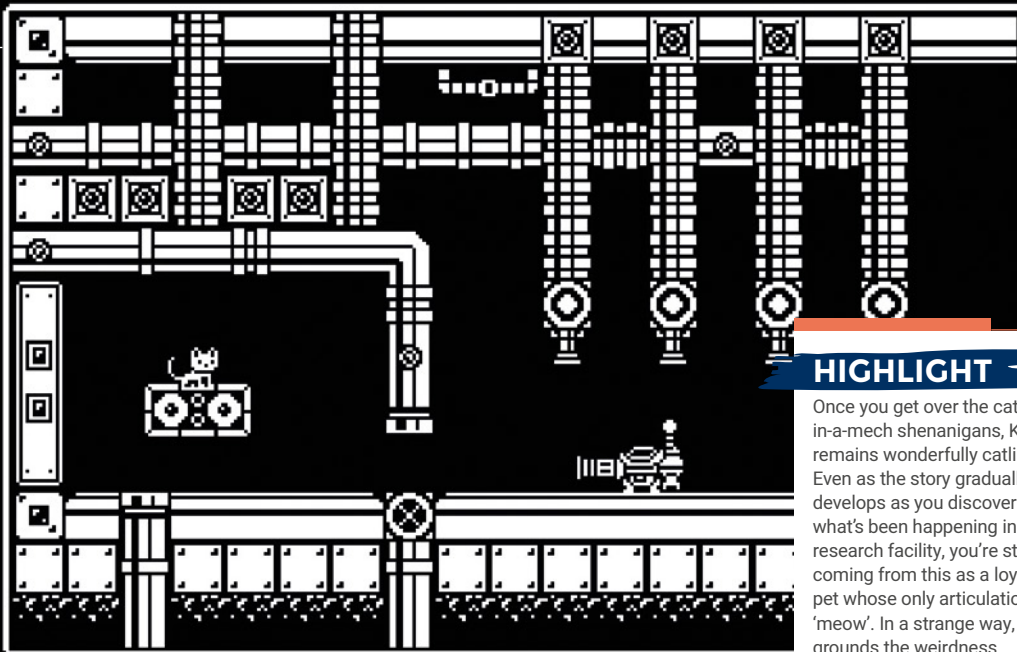
These unique, fun level designs speak to the flexibility of *Super Mario Maker 2*, but also suggest that Nintendo has been influenced by

what creators built in the first game, and how they found ways to bend the creation tools into interesting shapes. *Super Mario Maker 2* leans into this, resulting in one of the best, most accessible, and most fun level creation toolsets around. In the review period, during which media and influencers were creating and uploading levels, one player built a functional *Super Mario World* shoot-'em-up using a Fire Koopa Clown Car and a heap of Fire Flowers. Another used a crane to make a one-shot 'golf' game. A personal favourite involved an obstacle course built for the Koopa Troopa Car that required precision jump timing and a keen awareness of your surroundings.

Wisely, most of your creation tool kit is unlocked from the start this time (aside from a small number of story mode unlockables), including the numerous new additions. There are new level themes that can be used, including desert, forest, and snow levels; you can set 'clear' conditions, so that a level needs to be completed while collecting a lot of coins, taking out every enemy, or even without jumping; two players can work on courses together now with a Joy-Con each, and you can play through levels with up to four players. There are a lot of additions and tweaks made to the already excellent template set by the first game – too many to list, but odds are that if you found



▲ Jumping between locations via pipes can make some levels feel expansive and open, allowing for complicated designs.



HIGHLIGHT

Once you get over the cat-in-a-mech shenanigans, Kiki remains wonderfully catlike. Even as the story gradually develops as you discover what's been happening in this research facility, you're still coming from this as a loyal pet whose only articulation is 'meow'. In a strange way, this grounds the weirdness.

▼ With a cat for a protagonist, of course the villain is a rat.

Review

Gato Roboto

Small but purrrfectly formed

▲ Who needs next-gen graphics when you've got a good kitty?

Info

GENRE
Meowtroidvania
FORMAT
Switch (tested)
/ PC
DEVELOPER
doinksoft
PUBLISHER
Devolver Digital
PRICE
£5.79
RELEASE
Out now

REVIEWED BY
Alan Wen

VERDICT

Gato Roboto is short but sweet; a simple burst of feline joy.

71%

I love a good Metroidvania, but when the genre's a dime a dozen these days, just how does a developer make theirs stand out? In doinksoft's case, you just double down and combine the genre with the internet's most saturated meowing subject matter, and *Gato Roboto* is the result. You take control of Kiki, the pet cat of spaceship captain Gary, who must save her stricken owner after he crash-lands in a research facility. Oh, and Kiki can pilot a lumbering mech suit. Now I've seen everything.

Of course, once you get over the novelty, this self-described 'Meowtroidvania' plays just as you'd expect. Its lo-fi visuals don't hide any innovations, compared to Devolver Digital's other monochrome releases like *Downwell* or *Minit*, with your cat-sized mech going through similar upgrade motions Samus Aran has undergone many a time, from firing basic shots in four directions (no diagonal fire here, however) to acquiring missiles, phase dashing, and a double-jump spin, which allow you access to previously unreachable areas.

Where it does differ is that Kiki is also free to exit the suit, and there's plenty of times you'll need to do so in order to get through tight spaces, scale walls, or swim underwater (the latter stretching credibility, relatively speaking). You're also left powerless at these moments, and contact with an enemy means instant death. Fortunately, save points are also generously located, which respawn your suit back to full health.

The game ups the ante around the midpoint, bearing its claws with some progressively tricky bosses that challenge you to master all your abilities. It's during these moments, however, that the controls prove a little finicky, such as how firing missiles also causes you to recoil, making outmanoeuvring projectiles more frustrating than necessary.

Nonetheless, it makes for a fun, bite-sized romp that you can sail through in a few hours, a ticking timer at the bottom of the screen no doubt encouraging speedrunners to beat it in even less. Although that might be at odds with

the occasions when the game deliberately impedes your progress until you've killed all the enemies in the room.

As with other Metroidvanias, there are plenty of secrets hiding in the map's nooks and crannies, with some optional upgrades you can get through the game without ever finding. The only shame here is that, unlike the timer, there's no percentage counter displayed – at least not until you've beaten the game – and by then you're already past the point of no return. Then again, the benefit of this being a short game is that starting again doesn't feel like a slog.

At a time when most of our attention is on next-gen and service games promising more content than we even have time for, *Gato Roboto* may not be pushing the envelope in any regard, but it's still a refreshingly compact – and superbly animated – indie delight. 🐾

"A bite-sized romp you can sail through in a few hours"



Dancing with demons in the dark (and dying)

With Sigil, John Romero proves he does want to make you his... well, not his friend

And just like that, John Romero returns to *Doom*. Some 25-plus years since the original game that first raised the bar, the chap who had a hand in many of the most memorable levels in it has sat himself down and created a whole new episode. It's called *Sigil*, it's free, and you play it just like any other WAD. So go try it yourself, see what you think.

Me? I'm playing it, but I feel like it's getting swiftly to the point where I'll have to give up. In the years since *Doom's* release, it seems my reflexes have dulled to the point I am getting my backside handed to me by the devil's favourite demons. And John Romero. Well, it could be that, but it could also be that *Sigil* is an absolutely unforgiving *bugger* of an episode. I'm not sure.

Picking up after the events of *The Ultimate Doom: Thy Flesh Consumed*, it was always a safe assumption *Sigil* would maintain the previous episode's level of challenge. I let myself believe, though, that the challenge would be manageable. Not endless dark corridors pasted with Barons of

Hell (and a shotgun to tackle them with), followed closely by cascading 'gotcha' trap rooms – enter a room, a wall drops, pick up an item, a second wall drops, take half a step forward, a third wall, think happy though-*fourth wall drops*. It's... taxing.

I'm trying to remain positive here – *Sigil* shows some deft level design and is a step above plenty of other *Doom* – and *Doom II* – WADs we've seen in the past almost-three-decades. It's fiendish in the best sense of the word, creative and perplexing in all the right ways, and generally a solid, difficult addition to *Doom*. At the same time, it does feel like it's lacking something, and I can't quite put my finger on it.

Basically, and I know this sounds stupid, it *feels* old-fashioned. It's *Doom*, of course it does, but it doesn't feel like the tricks and advances made in shooters – even in *Doom*, thanks to its still-healthy modding scene – have even been given a second look.

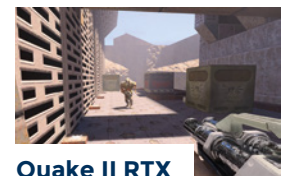
So that's a weird feeling to have, given how excited I was to see Romero bring us another, proper, completely unofficial, episode. But even with those criticisms and a general – very low level – malaise on playing it, there's still no denying it's extremely cool to be playing a new *Doom* episode in 2019, from one of the main bods behind it. It might not feel modern (I know, I know), but it definitely feels like *Doom*. And really, what more could we ask for from *Sigil*?

Just remember though, if all else fails: open console > iddqd. 🗿

“It's extremely cool to be playing a new *Doom* episode in 2019”



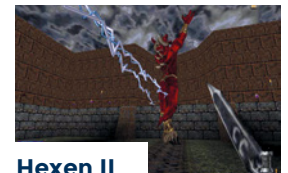
Wireframe Recommends



Quake II RTX

PC

2019's biggest 'can your PC run it?' question rests on the shoulders of a tweaked version of a 20-year-old FPS. Because of course it does. Download *Quake II RTX* today and kill your graphics card!



Hexen II

PC

Raven's oft-forgotten sequel took the dark fantasy of *Hexen* and spliced it with *Quake's* tech. The result was deep, inventive, and a lot of fun. Naturally, it failed commercially.



Strife

PC

It's not the original FPS-RPG, but it is a great one that's overlooked a lot of the time. For a fiver or so on Steam, it's worth a pop to see the influence *Strife* had.



Wonder Boy

It made running fast an exhilarating delight
– five years before a certain hedgehog

ESCAPE / 1986 / Arcade, Various

Even in a genre not commonly singled out for its cerebral qualities, *Wonder Boy's* a mechanically straightforward platformer. Released in 1986, just one year after *Super Mario Bros.*, it's markedly simple even when compared to that genre touchstone on the NES: *Wonder Boy* asks little more from the player than sharp reflexes and a decent memory for level layouts. There's little of *Super Mario Bros.*' variety, nor the nuance in its controls and power-ups that made Shigeru Miyamoto's outing such a classic. And yet, in its own, modest way, *Wonder Boy* – designed by Ryuichi Nishizawa at Tokyo-based developer Escape (later Westone) – has still exerted its own influence on video game history.

A product of the eighties arcade era rather than the Japanese console boom, *Wonder Boy* is built with the express purpose of making the player go faster. In place of a time limit, there's a rapidly falling energy bar that requires the constant consumption of fruit; fail to collect enough fruit, or take too long to reach the end of a stage, and hero Tom Tom will literally starve to death. Said fruit, in turn, will vanish from the screen if you don't jump and collect it in time. Meanwhile, a skateboard power-up gives you the option of hurtling through stages with even greater speed, the trade-off being that attempting to tackle fiddlier stages of moving platforms and bouncing enemies at such speed will inevitably result in the loss of your skateboard; like the power-ups in *Super Mario Bros.*, the skateboard acts as an extra hit point.

“Nishizawa designed *Wonder Boy* in response to *Super Mario Bros.*' jumping physics, which he detested”

There are other elements to accompany all this – each stage contains a doll, which all need to be collected to complete the game, plus there are sundry other point-boosting items to collect – but the main game loop is dominated by running, jumping, and throwing tiny hammers at enemies. Fortunately, the flow of that running and jumping is an absorbing delight. There's an exhilaration to mastering the precise long and short jumping arcs required to clear obstacles and collect fruit in the most efficient way possible; in essence, *Wonder Boy's* a score attack game, since it's far more fun to practice beating your own high scores than using continues to brute-force your way to the ending. Nishizawa once said that he designed *Wonder Boy* in response to *Super Mario Bros.*' jumping physics, which, controversially, he said he detested. Whether you agree with his sentiment or not, it's at least true that *Wonder Boy*, in both its arcade incarnation and the better ports to home systems, has some of the most satisfying and precise controls of any eighties platformer.

Wonder Boy would, of course, establish a series that's still going today; later entries largely abandoned the speed-running format of the first game and headed in an action-RPG direction (confusingly, many of these games went under different names entirely). This was probably just as well, because in 1991, *Sonic the Hedgehog* came along and made dashing around at a blistering pace all hip and trendy. *Wonder Boy*, we'd argue, got there first – he was just too modest to make a big fuss about it. 🐉

Next Issue

ON SALE 18 JULY



ANCESTORS

THE HUMANKIND ODYSSEY

The creator of Assassin's Creed evolves the survival genre

Don't miss out!
Subscribe
PG54

Also

- ▶ The devs making fighting games accessible again
- ▶ Code your own automatic maze generator
- ▶ Inside Serbia's vibrant game design scene
- ▶ Control: why it's Remedy's step into the unknown

Editorial

Editor

Ryan Lambie

Email ryan.lambie@raspberrypi.org

Features Editor

Ian Dransfield

Email ian.dransfield@raspberrypi.org

Sub Editors

David Higgs & Vel Ilic

Design

criticalmedia.co.uk

Head of Design

Lee Allen

Designer

Harriet Knight

Contributors

Jon Bailes, Lottie Bevan, David Crookes, Rik Cross, Konstantinos Dimopoulos, Will Luton, Ed Nightingale, James O'Connor, Jordan Oloman, Jeff Spoonhower, Maggie Tan, Paul Kilduff Taylor, Howard Scott Warshaw, Alan Wen, Jack Yarwood

Publishing

Publishing Director

Russell Barnes

Email russell@raspberrypi.org

Director of Communications

Liz Upton

CEO

Eben Upton

Advertising

Commercial Manager

Charlie Milligan

Email charlotte.milligan@raspberrypi.org

Tel +44 (0)7725 368887

Distribution

Seymour Distribution Ltd

2 East Poultry Ave, London EC1A 9PT

Tel +44 (0)207 429 4000

Subscriptions

Unit 6, The Enterprise Centre, Kelvin Lane, Manor Royal, Crawley, West Sussex, RH10 9PE

To subscribe

Call 01293 312192 or visit wfmag.cc/subscribe

Subscription queries

wireframe@subscriptionhelpline.co.uk



This magazine is printed on paper sourced from sustainable forests and the printer operates an environmental management system which has been assessed as conforming to ISO 14001.

Wireframe magazine is published by Raspberry Pi (Trading) Ltd, Maurice Wilkes Building, St. John's Innovation Park, Cowley Road, Cambridge, CB4 0DS. The publisher, editor, and contributors accept no responsibility in respect of any omissions or errors relating to goods, products or services referred to or advertised in the magazine. Except where otherwise noted, content in this magazine is licensed under a Creative Commons Attribution-NonCommercial-ShareAlike 3.0 Unported (CC BY-NC-SA 3.0).
ISSN: 2631-6722 (print), 2631-6730 (online).



UNLOCK YOUR GAME



JOIN THE PRO SQUAD

1ms

144Hz

Free Sync



RED EAGLE™

GB260HSU | GB270HSU | GB2760QSU



GET IN THE GAME

1ms
75Hz



Free Sync



BLACK HAWK™

G2288HS | G2530HSU | G2730HSU | GB2530HSU | GB2730HSU



IMMERSE YOURSELF IN THE GAME

4K



Free Sync



GOLD PHOENIX™

GB2888UHSU



ENTER A NEW DIMENSION

2560
x
1440

1ms
75Hz

Free Sync



SILVER CROW™

GB2783QSU