The Mexican Conference on Pattern Recognition After Ten Editions: A Scientometric Study

Octavio Loyola-González[1(✉)], Miguel Angel Medina-Pérez[2],
José Fco. Martínez-Trinidad[3], and Jesús Ariel Carrasco-Ochoa[3]

[1] Tecnologico de Monterrey, Vía Atlixcáyotl No. 2301,
Reserva Territorial Atlixcáyotl, 72453 Puebla, Mexico
octavioloyola@tec.mx
[2] Tecnologico de Monterrey, Carr. al Lago de Guadalupe Km. 3.5,
52926 Atizapán, Estado de México, Mexico
migue@tec.mx
[3] Instituto Nacional de Astrofísica, Óptica y Electrónica, Luis Enrique Erro No. 1,
Sta. María Tonanzintla, 72840 Puebla, Mexico
{fmartine,ariel}@inaoep.mx

Abstract. Scientific conferences are suitable vehicles for knowledge dissemination, connecting authors, networking, and research entities. However, it is important to know the impact of a determined conference for the international research community. The main way to do this is through a scientometric study of those papers derived from the conference. Therefore, in this paper, we introduce a scientometric study taking into account all papers published in each edition of the Mexican Conference on Pattern Recognition (MCRP) as well as all the papers published in special issues derived from MCPR. Our study is based on data taken from the SCOPUS database. We have extracted and analyzed several essential keys, such as acceptance and rejection rates, number of authors and top-productive institutions, and frequency of citations by other journals, with the aim of providing the impact of the papers derived from MCPR for the international research community. From our study, we report some important findings about the impact of the MCPR conference after ten editions.

Keywords: MCPR · Scientometrics · Information extraction

1 Introduction

Scientific conferences are the basic instruments in the process of knowledge dissemination by their short publication deadlines and their possibility of publishing incipient papers with important advances for the research community; at the same time, conferences are vehicles for connecting authors, networking, and research entities; among others.

Nowadays, there are several scientific conferences[1] promoting a space for the exchange of scientific results, experiences, new knowledge, and cooperation among research groups. Usually, the most relevant conferences promote to publish their oral presentations and posters on scientific journals, such as Lecture Notes Series, as conference proceeding.

The most common approach to measure the international relevance of a scientific conferences is to analyze the impact of their published papers through a scientometric study [10]. From this study, several key items are measured, such as acceptance and rejection rates, promptness of publication, and the number of citations by other journals, which provide an idea of the impact of the published papers on the international research community.

The Mexican Conference on Pattern Recognition (MCPR), organized every year since 2009 and published in Lecture Notes in Computer Science (LNCS) since 2010, aims to promote the development of the Pattern Recognition (PR) discipline among the Mexican and worldwide scientific community. MCPR has promoted several Special Issues (SIs), mainly fed from extensions of papers presented during their conferences, but also open to contributions of the international community working on PR areas. However, as far as we know, there is not a study showing the impact of this conference inside and outside of Mexico. Hence, in this paper, we introduce a scientometric study with the aim of measuring the impact of MCPR on the international research community. Our study relies on the SCOPUS database as a suitable source for extracting reliable information about the impact of MCPR. Our study presents findings on total citations, the rate of growth of citations excluding self-citation, number of authors, countries with more participation, and top-productive institutions and authors.

The remainder of the paper is organized as follows. Section 2 shows preliminaries for the MCPR and the Scientometric approach. Section 3 describes the methodology implemented for data acquisition and data extraction as well as a deep analysis and discussion of our study. Finally, Sect. 4 presents our conclusions and future works.

2   Preliminaries

In this section, we present an overview about MCPR as a forum for the exchange of scientific results and the foundations of the scientometric approach.

The MCPR is a forum for the exchange of scientific results, experiences, and new knowledge, as well as, promoting cooperation among research groups in PR and related areas in Mexico and around the world. MCPR is under the direction of the Computer Science Department of the National Institute for Astrophysics Optics and Electronics (INAOE) and other Mexican institutions. MCPR had international scientific committees, which contain well-known researchers. All

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[1] https://scholar.google.com/citations?hl=es&view_op=search_venues&vq=conference&btnG=.

MCPR editions, excepting the first one, have been published on LNCS and several of them have published Special Issues (SI), (see Table 1).

Table 1. Editions of the Mexican Conference on Pattern Recognitions (MCPR)

Acro.	Place	Date	Vol	Count.	Cites	Cites^A	SI	Sponsors
MWPR 2009	Guadalajara, Jalisco	November 14, 2009	–		0	0	No	INAOE, CINVESTAV, IPN
MCPR 2010	Puebla, Puebla	September 27–29, 2010	6256	12	102	68	Yes	INAOE, IAPR, LNCS, MACVNR
MCPR 2011	Cancún, Quintana Roo	June 29–July 2, 2011	6718	11	126	84	Yes	INAOE, IAPR, LNCS, MACVNR, ITC
MCPR 2012	Huatulco, Oaxaca	June 27–30, 2012	7329	15	83	43	Yes	INAOE, IAPR, LNCS, MACVNR
MCPR 2013	Querétaro, Querétaro	June 26–29, 2013	7914	13	120	75	Yes	INAOE, IAPR, LNCS, MACVNR, IEEE, CONACYT, CONCYTEQ, IPN, CICATA
MCPR 2014	Cancún, Quintana Roo	June 25–28, 2014	8495	17	80	47	Yes	INAOE, IAPR, LNCS, MACVNR, BUAP
MCPR 2015	Mexico City	June 24–27, 2015	9116	12	33	13	Yes	INAOE, IAPR, LNCS, MACVNR, IPN
MCPR 2016	Guanajuato, Guanajuato	June 22–25, 2016	9703	10	26	10	Yes	INAOE, IAPR, LNCS, MACVNR, UGTO
MCPR 2017	Huatulco, Oaxaca	June 21–24, 2017	10267	13	12	3	No	INAOE, IAPR, LNCS, MACVNR, BUAP
MCPR 2018	Puebla, Puebla	June 27–30, 2018	10880	7	1	0	No	INAOE, IAPR, LNCS, MACVNR, BUAP

Table 1 shows for each MCPR edition its acronym (Acro.), place where the conference was carried out, date, volume in LNCS (Vol.), number of participating countries (Count.), total citations (cites), number of citations without self-citation (Cites^A), if it had an associated SI, and sponsors. At the conference website www.mcpr.org.mx into the section "previous MCPRs".

It is important for the organizing committee of MCPR to know if the conference is having an impact on the research communities inside and outside of Mexico. As a consequence, a study taking into account statistical data coming from a database of peer-reviewed literature, like SCOPUS, is needed.

In the last decades, journals have been indexed in databases and the indexation is determined by well-defined and quantifiable criteria, such as acceptance and rejection rates, promptness of publication, coverage by major abstracting and indexing services, high-confidence level of scientists using the journal in its contents, high frequency of citation by other journals (impact), and providing author(s) addresses (author reputation score); among others [15].

Scientometrics is the study of the quantitative aspects of science. It involves quantitative studies of scientific activities, including, among others, publication, and so overlaps bibliometrics to some extent [10]. As a consequence, a scientometric study should be based on reliable databases, like SCOPUS, which index the published papers on different journals.

Usually, the impact of a conference is measured by the number of citations to their published papers by papers from other journals, having more importance those with more citations, excluding self-citations (cites[4]). Also, the acceptance and rejection rates are important for evaluating the impact of a conference because, commonly, those conferences having high rejection rates include only high-quality papers that generate several citations, and they are considered as excellent forums for disseminating research results and for creating research collaboration networks. Also, other key items are taken into account such as the number of participating countries, research areas of the presented papers, and if the conference promotes the call for papers for special issues. Hence, all these items were taken into account in our scientometric study for evaluating the quality of MCPR.

3   Scientometric Study of MCPR

In this section, we show the methodology implemented for data acquisition and data extraction from SCOPUS regarding each MCPR edition published on LNCS and their SIs (Sect. 3.1), as well as a deep analysis and discussion of our study (Sect. 3.2).

3.1   Data Acquisition

In our study, data acquisition was designated to extract information from SCOPUS[2], a database of peer-reviewed literature. For this extraction, we use the Application Programming Interfaces (APIs) provided by Elsevier Developers[3], which allow obtaining up to 6,000 results[4] for each query. For each paper published in LNCS as well as each paper published in a SI, which are derived from MCPR editions and indexed by SCOPUS, we have extracted several features such as title, the name of authors, affiliations, number of citations, number of citations excluding self-citations, and keyword indexation. Besides, we obtained from the MCPR organizers the number of submissions and accepted papers for each LNCS book and SI. Also, from the Web of Science (webofknowledge.com), we got the h-index and the impact factor of those SI indexed into the Journal Citation Reports (JCR). Also, we contrast the information extracted from SCOPUS with the one provided by Google Scholar[5] at

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[2] www.scopus.com.

[3] http://dev.elsevier.com/sc_apis.html.

[4] http://dev.elsevier.com/tecdoc_developer_faq.html.

[5] Google Scholar is a free web search engine that indexes published scientific papers.

the following URL: https://scholar.google.com/citations?hl=es&view_op=list_hcore&venue=pppC_Wi5EMQJ.2018. Finally, we have consulted with the organizing committee and the MCPR' web pages all those information which were not provided by SCOPUS, for example, keynote speakers, conference venue, among others.

3.2 Analysis and Discussion

The aim of this study is showing the impact of MCPR taking into account each edition published in LNCS as well as those SIs derived from MCPR.

Figure 1 shows the number of submissions, number of accepted papers, and citations for each MCPR edition published in LNCS (left side) as well as each SI derived from MCPR (right side). From this figure, we can see that from MCPR2010 to MCPR2014 the total of citations per edition is above 80 and the number of citations excluding self-citation (cites^A) is above 50. Editions from MCPR2015 to MCPR2018 have fewer citations than older editions, which is normal because usually, the newer papers have fewer citations. Also, from this figure, we can see that for those editions published in the year 2013 are the most cited. In addition, it is important to highlight that MCPR has a rejection rate higher than 40% for LNCS and more than 70% for SI; which is a high-quality indicator for this type of conference and SI.
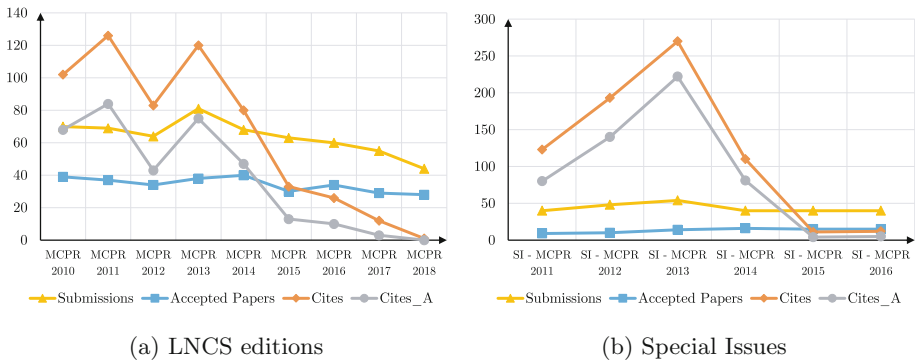

(a) LNCS editions   (b) Special Issues

Fig. 1. Graphic showing the number of accepted papers and citations for each LNCS and SI derived from MCPR.

Figure 2 shows two donut charts containing the countries participating in the LNCSs and SIs derived from MCPR. This information was extracted from the affiliation provided by each author in each one of the published papers. From this figure, we can notice that there are more Mexican researchers participating for both LNCSs and SIs derived from MCPR than from other nationalities. Although, analyzing this figure (left side) without taking into account Mexico, for LNCS there are more authors from Cuba, United States, and Spain than

from the remaining countries. For the SIs derived from MCPR, there a similar behavior although there are more participation of authors coming from France, Italy, China, Brazil, and New Zealand than for authors participating in LNCS.

Figure 3 shows two donut charts containing the research areas of the papers published in the LNCSs and SIs derived from MCPR. From this figure, we can see that, for LNCS editions, there are more papers associated with the PR area than to the remaining areas. On the other hand, for SI derived from MCPR, there is a balanced distribution among the research areas, highlighting the areas of PR, classification of information, mathematical computing, clustering algorithm, optimization, data mining, image segmentation, feature extraction, time series, and learning systems [13]; among others.

Table 2 shows the most cited papers taking into account all LNCS and SI derived from MCPR; this table shows the top-ten papers for LNCS and the top-ten for SIs. In this table, we detailed for each paper, its title, research area, year of publication, country associated to each author, number of authors, reference (Ref.), total of citations, number of citations excluding self-citations (Cites^A), the ratio between cites and cites^A, and if it was published in a LNCS or SI edition.

From Table 2, we can see that those papers published in SIs have more citations and more citations without self-citations than those published in LNCS. Also, we can notice that most of the papers published in LNCS are from Mexican authors. On the other hand, for SIs, most of the papers are from Italy and Poland. In addition, we can notice that those papers reporting advantages in areas like image processing, biometrics, Bayesian networks, and object recognition obtained more citations without self-citations than the remaining research areas. Besides, the most cited papers in LNCS were published in 2011 and for the SIs, the most cited papers were published in 2015. Additionally, from Table 2, we can see that, on average, the number of authors is four, the number of citations is 24 and without self-citations is 20.

Additionally, from the data extracted from SCOPUS, we can see that INAOE, IPN, BUAP, and Tecnologico de Monterrey are the top-contributor institutions in Mexico to MCPR.

From all data, we can see that, on average, LNCS included 35 papers, receiving 73 citations from which 43 are not self-citations. In the same vein, SIs derived from MCPR, on average, included 13 papers which generate 120 citations in total from which 89 are not self-citations. From this, we can generalize that those papers published in LNCS could generate at least two citations from which one could be a non-self-citation and those papers published on a SI derived from MCPR, could generate, at least, nine citations from which seven could be non-self-citations.

It is important to highlight that there are some items which can not be collected by SCOPUS, but they are essential for an excellent conference such as high-level keynotes speakers, nice conference venue, international program committee, high-quality tutorials, and additional meetings during the conference like a postgraduate students' meeting. For MCPR, we have consulted the web pages
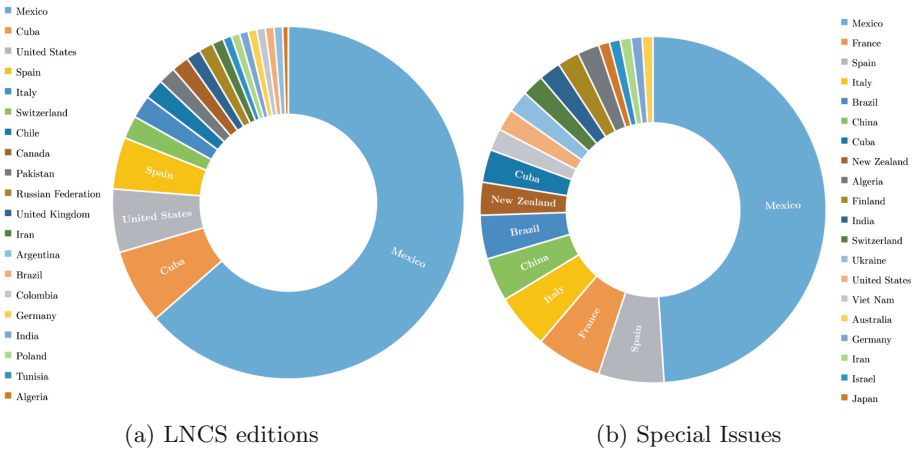
(a) LNCS editions   (b) Special Issues

Fig. 2. Donut chart containing the countries participating in the LNCSs and SIs derived from MCPR.

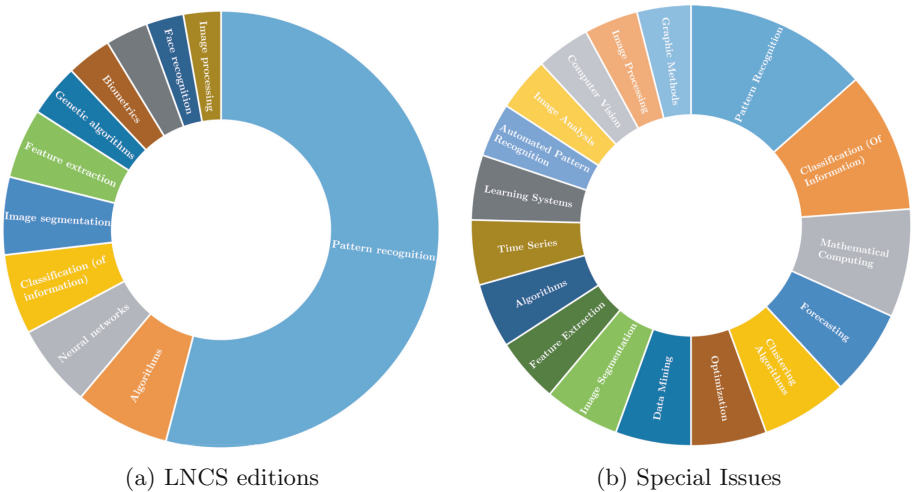(a) LNCS editions   (b) Special Issues

Fig. 3. Donut chart containing the research areas with more papers published in LNCS and SIs derived from MCPR.

of each edition for extracting this information. Finally, based on the information provided by the MCPR's web pages and our scientometric study, we can conclude that MCPR is a high-quality conference on PR and related areas, with contributions from inside and outside of Mexico.

Table 2. Papers more cited for all LNCS and SI editions

Title	Area	Year	Country	Authors	Ref.	Cites	Cites^A	Cites*	Edition
Traffic sign detection via interest region extraction	Computer vision	2015	Italy	5	[19]	41	41	1.00	SI
A subspace co-training framework for multi-view clustering	Clustering	2014	France	3	[23]	33	33	1.00	SI
People detection using color and depth images	Image Processing	2011	Mexico	2	[18]	25	25	1.00	LNCS
Thermal video analysis for fire detection using shape regularity and intensity saturation features	Video Processing	2011	Mexico	2	[2]	9	9	1.00	LNCS
Deep learning for emotional speech recognition	Speech recognition	2014	Mexico, Argentina	5	[20]	8	8	1.00	LNCS
Evolutionary multi-objective optimization: Basic concepts and some applications in pattern recognition	Evolutionary optimatization	2011	Mexico	1	[3]	8	8	1.00	LNCS
Local contrast phase descriptor for fingerprint liveness detection	Biometrics	2015	Italy	4	[9]	48	45	0.94	SI
Breaking reCAPTCHAs with unpredictable collapse: Heuristic character segmentation and recognition	Image Processing	2012	Mexico	5	[4]	16	15	0.94	LNCS
A fuzzy clustering algorithm with spatial robust estimation constraint for noisy color image segmentation	Image Processing	2013	Mexico	3	[14]	31	28	0.90	SI
Multi-label classification with Bayesian network-based chain classifiers	Bayesian networks	2014	Mexico, Australia, Spain	6	[22]	46	41	0.89	SI

Table 1. (*continued*)

Spatial-based skin detection using discriminative skin-presence features	Object recognition	2014	Poland	2	[11]	51	44	0.86	SI
Breaking text-based CAPTCHAs with variable word and character orientation	CAPTCHAs	2015	Mexico	4	[21]	22	19	0.86	SI
Music genre classification: A semi-supervised approach	Semi-supervised Classification	2013	Mexico, United Kingdom, United States	5	[16]	12	10	0.83	LNCS
GANT: Gaze analysis technique for human identification	Face recognition	2015	Italy	5	[1]	37	30	0.81	SI
Genetic fuzzy relational neural network for infant cry classification	Neural network	2011	Mexico	3	[17]	13	10	0.77	LNCS
LIDAR and panoramic camera extrinsic calibration approach using a pattern plane	Image Processing	2013	Mexico	5	[8]	8	6	0.75	LNCS
Improving classification performance of breast lesions on ultrasonography	Computer aided diagnosis	2015	Brazil	3	[6]	19	12	0.63	SI
Automatic ultrasound image analysis in Hashimoto's disease	Image Processing	2010	Poland	3	[12]	16	9	0.56	LNCS
A new gaze analysis based soft-biometric	Biometric	2013	Italy	5	[7]	9	5	0.56	LNCS
Representing scenes for real-time context classification on mobile devices	Signal processing	2015	Italy	5	[5]	24	8	0.33	SI

4   Conclusions

In this paper, we presented a scientometric study of the publication derived from all MCPR editions; including their Special Issues in Journals, from 2010 to 2018. The analysis unveils findings on citations, number of authors, countries with more participation, and top-productive institutions and authors.

From our study, we can conclude that MCPR is becoming a prominent conference for the pattern recognition research community, including research areas such as image processing, biometrics, and neural networks. More than a half of the papers published in LNCS are from top-contributor institutions and authors in Mexico such as INAOE, IPN, BUAP, and Tecnologico de Monterrey, while the remaining are from outside of Mexico. This behavior changes for SIs derived from MCPR where there is more balance among the participating countries; although, the aforementioned Mexican institutions continue being those who most contribute. Also, we can conclude that SI publications generate more citations than LNCS publications, which makes sense because journals into the JCR have higher impact than those which are not included in the JCR. Although it is important to highlight that, on average, LNCSs derived from MCPR accept 35 papers, receiving 73 citations from which 43 are not self-citations. On the other hand, SIs derived from MCPR accept 13 papers, which generate 120 citations from which 89 are not self-citations.

Additionally, we can conclude that the most cited MCPR papers included in LNCS are from Mexican authors and the most cited papers included in SIs are from people with affiliation from Italy and Poland. In addition, for both LNCS and SI of MCPR, those papers in areas like image processing, biometrics, Bayesian networks, and object recognition attained more citations than papers in the remaining research areas.

Overall, in this paper, we have been able to analyze the scientometric behavior of the MCPR. To the best of our knowledge, it is the first work of its kind for this conference.

As future work, we plan to extract information from SCOPUS for the top-prominent conferences on PR in the world, and as a result, we will be able to extract contrast patterns from this information in order to show the main differences and similarities among them.

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