MAPPING THE INTELLECTUAL STRUCTURE OF THE INTERNATIONAL JOURNAL OF COMPUTERS COMMUNICATIONS & CONTROL: A CONTENT ANALYSIS FROM 2015 TO 2019

8TH INTERNATIONAL CONFERENCE ON COMPUTERS COMMUNICATIONS AND CONTROL (ICCCCC)

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1. INTRODUCTION

CONTEXT
International Journal of Computers Communications & Control (IJCCC) is an open access peer-reviewed journal publishing original research papers and it is considered by professionals, academics and researches as one of the main sources of knowledge in the integrated solutions in computer-based control and communications, computational intelligence methods and soft computing, and advanced decision support systems fields.

OBJECTIVE
The main aim of this contribution is to develop a bibliometric analysis to evaluate the performance and conceptual evolution of the International Journal of Computers Communications & Control (IJCCC) from 2015 to 2019. The analysis is developed using SciMAT.
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2. METHODOLOGY

SOFTWARE TOOL
SciMAT was employed to develop a longitudinal conceptual science mapping analysis based on co-words bibliographic networks.

METHODOLOGY STAGES
1. Detection of the research themes. Co-word analysis, followed by a clustering of keywords to topics/themes. The similarity between the keywords is assessed using the equivalence index.

2. Visualizing research themes and thematic network. Strategic diagram and thematic network (centrality and density). Research themes mapped in a two-dimensional strategic diagram and classified into four groups (Figure 1): i) motor, ii) basic/transversal, iii) highly developed-isolated, and iv) emerging/declining

3. Performance analysis. Relative contribution of the research themes to the whole research field: number of published documents, number of citations, and different types of bibliometric indices (h-index).
2. METHODOLOGY

(a) Strategic diagram

(b) Thematic network
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3. DATASET

CORPUS AND DATABASE
International Journal of Computers Communications & Control (IJCCC) documents published from 2015 to 2019 in the Web of Science.

QUERY

TIME PERIOD
The corpus was evaluated in a single period from 2015 to 2019.

CORPUS SIZE
- 314 documents (articles), 1.093 cites and 2.094 keywords.
- Citations count up to 6th January 2020.
- 2015: 75 documents, 373 cites and 468 keywords.
- 2016: 64 documents, 283 cites and 359 keywords.
DOCUMENTS AND CITATIONS BY YEAR

<table>
<thead>
<tr>
<th>Year</th>
<th>Documents</th>
<th>Cites</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>75</td>
<td>313</td>
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<tr>
<td>2016</td>
<td>64</td>
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<td>2018</td>
<td>59</td>
<td>526</td>
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<tr>
<td>2019</td>
<td>57</td>
<td>641</td>
</tr>
</tbody>
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4. CONCEPTUAL ANALYSIS

Strategic diagram 2015-2019
4. CONCEPTUAL ANALYSIS

<table>
<thead>
<tr>
<th>Theme</th>
<th>Quadrant</th>
<th>Documents</th>
<th>Citations</th>
<th>h-index</th>
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</thead>
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<tr>
<td>MULTI-CRITERIA-DECISION-MAKING</td>
<td>Q1</td>
<td>29</td>
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<td>EVIDENTIAL-REASONING</td>
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<td>16</td>
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<td>23</td>
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<tr>
<td>MACHINE-LEARNING</td>
<td>Q1</td>
<td>22</td>
<td>112</td>
<td>5</td>
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<tr>
<td>MEMBRANE-COMPUTING</td>
<td>Q2</td>
<td>33</td>
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<tr>
<td>CRITERIA-DECISION-MAKING</td>
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<td>21</td>
<td>41</td>
<td>4</td>
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<td>COLLABORATIVE-FILTERING</td>
<td>Q2</td>
<td>8</td>
<td>36</td>
<td>4</td>
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<tr>
<td>WIRELESS-SENSOR-NETWORK</td>
<td>Q2</td>
<td>34</td>
<td>31</td>
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<tr>
<td>PATTERN-RECOGNITION</td>
<td>Q3</td>
<td>14</td>
<td>45</td>
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<tr>
<td>MULTI-OBJECTIVE-OPTIMIZATION</td>
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<td>10</td>
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<td>3</td>
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<td>INTERNET-OF-THINGS</td>
<td>Q3</td>
<td>8</td>
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<td>FUZZY-LOGIC-APPROACH</td>
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<td>FUZZY-CONTROL</td>
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</table>

In terms of productivity, the most productive theme of the IJCCC is NEURAL-NETWORKS, which is related mainly with DEEP-LEARNING, COMPUTATIONAL-INTELLIGENCE, ARTIFICIAL-INTELLIGENCE, MODEL-PREDICTIVE-CONTROL and SENTIMENT-ANALYSIS.
4. CONCEPTUAL ANALYSIS
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(m) LOAD-BALANCING
    |\                  |
    |                  |
MULTIHOMING        MULTI-OBJECTIVE-OPTIMIZATION
    |\                  |
    |                  |
PETRI-NET-MODELS   PARETO-ANALYSIS

(n) PERSONALIZED-RECOMMENDATION
    |\                  |
    |                  |
COLLABORATIVE-FILTERING
    |\                  |
    |                  |
RATING-INTEGRATION
    |\                  |
    |                  |
SOCIAL-NETWORKING-SERVICES

(o) SIGNAL-ANALYSIS
    |\                  |
    |                  |
INTERNET-OF-THINGS
    |\                  |
    |                  |
WORKFLOW-MANAGEMENT-SYSTEMS
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An amount of 314 documents (articles) were retrieved from the WoS. This articles achieved 1.093 cites and 2.094 keywords.

The corpus was evaluated in a single five-years period.
- 2015: 75 documents, 373 cites and 468 keywords.
- 2016: 64 documents, 283 cites and 359 keywords.

The impact achieved is summarized in the following indicators:
- Average citations per publication: 1.08
- Sum of Times Cited (without self-citations): 1.093 (963)
- Citing articles (without self-citations): 834 (726)
- h-index: 14 publications
CONCLUSIONS

MAIN CONCLUSION
- In view of the results from the performance and science mapping analysis, two main research themes groups were identified. The first group is the most productive themes (NEURAL-NETWORKS, WIRELESS-NETWORKS, WIRELESS-SENSOR-NETWORK and MEMBRANE-COMPUTING) covered in the last five years and the second one is the most cited themes (MULTI-CRITERIA-DECISION-MAKING, EVIDENTIAL-REASONING, SIMILARITY-MEASURES and FUZZY-LOGIC-APPROACH).

FUTURE WORKS
- A yearly analysis could be carried out taking into account a wider time span and enriching the analysis with the main authors, organizations, countries, among others.
- Furthermore, it will allows identify the evolution of the themes and its position in the quadrants.
REFERENCES

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