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Short Communication

Augmented reality research in the 21st century pandemic situation by coronavirus disease (COVID-19): A bibliometric study

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ABSTRACT

Background: The aim of this study is to identify publications in 21st century pandemic situation by coronavirus disease (COVID-19) related to augmented reality (AR) and to describe the characteristics of those studies.
Materials and Methods: The Google Scholar database was searched for publications on AR in COVID-19 research criteria between 2019 and 2021. Bibliographic coupling of the details and co-occurrences of the publication of the author keywords were examined for the selected publications.
Results: A total of 2907 publications were selected following the research criteria between 2019 and 2021. The results showed that among the most researched researchers in AR study are the names of authors with color highlights from different countries.
Conclusion: The study addressed the pattern in research and advancement of the idea of increased pandemic reality for COVID19.

1. Introduction

Coronavirus Disease 2019 (COVID-19) pandemic caused by severe acute respiratory syndrome-coronavirus-2 (SARS-CoV-2) has affected several millions of people (around 178,118,597 confirmed infection cases, with more than 3,864,180 deaths and around 220 countries: 21st June 2021) due to the unavailability of specific anti-coronavirus therapy (WHO, 2020).[1] COVID-19 has remained a stubborn nominee, posing a serious threat to human health, despite constant efforts by academic (doctors, researchers and scientists) and industrial companies are undertaken to discover the specific therapeutics (Zhu et al., 2020).[2]

Augmented reality research can help the researcher and the science society in their research works. Virtual computer-assisted technologies can describe augmented reality (AR) as a direct or indirect real-time view of the real world situation (Carmigniani and Furht, 2011)[3] and it is considered to be very much essential in the pandemic situation. Discovery of new technology in science and in variety of other areas is relatively a new opening of reality. In this promising area of research, the publications and inventions are increasing and become more complex year after year. All the benefits of such technologies are difficult to share with science, as some of their results are not measurable quantitatively, but can be seen in all fields of human life after a long term (Karakus et al., 2019).[4] Researchers argue that the advantages of such technologies will benefit those countries which will invest in

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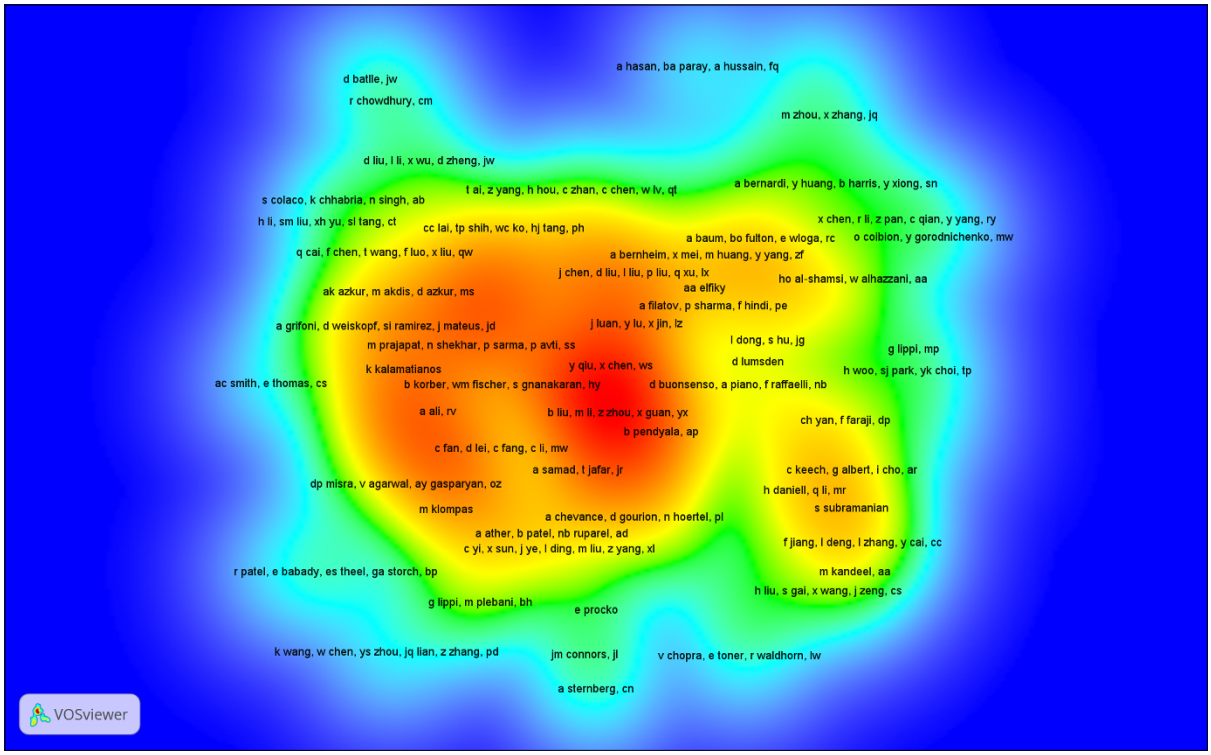

Fig. 1: Bibliographic coupling and co-occurrences of the author keywords (density visualization)

such technologies more than others. In comparing journals, countries, authors and institutions the quality and quantity of publications are the important one.

2. Materials and Methods

The aim of this study is to identify the publications related to AR in coronavirus disease 2019 (COVID-19) and describing the features of those studies. In the pandemic situation of the 21^{st} century, the google scholar database is searched by COVID-19 related studies keywords viz. Coronavirus main proteinase (3CLpro), Angiotensin-Converting Enzyme 2 (ACE2), COVID-19, Main proteinase (Mpro), Pandemic, Papain-like protease (PLpro), SARS-CoV-2, Spike protein (S protein) from 2019-2021 for publications and citations.

In all scientific disciplines, Google Scholar is the world leader in storing and processing scientific information and contains the most important databases. Bibliographic study and co-occurrences of the author keywords is examined for the selected publications on COVID-19. A total of 2907 publications are selected following the research criteria between 2019 and 2021. This study has illuminated the development and trend of increasing reality literature in pandemic situation.

3. Results

Bibliographic visualization methods are used to analyze and visualize the characteristics of the selected 2907 publications. VOSviewer software is used to conduct the evaluative analyses and to visualize all this information (Aristovnik et al., 2020).[5] The results revealed that author's names with color highlight from different countries are among the most studied researchers in AR research. Co-occurrences of the author keywords are presented in Figure 1 with density visualization. In Figure 1, the density of the author's names was illustrated through different colors.

This density visualization was weighted by the number of records publication. The colors turning to green, yellow and then red means bigger number of records on COVID-19 research. The results of the co-occurrences of researchers and groups indicate that the researchers have mostly studied the concepts related to the main concept of AR in COVID-19 research: 3CLpro, ACE2, COVID-19, Mpro, PLpro, SARS-CoV-2 and S protein. The research trend and the progress of the concept by researchers and their groups have been discussed in the paper.

4. Discussion

Bibliometric study is a kind of quantitative analysis using different publication patterns. In bibliometric methodology,

there are both evaluative and descriptive methods. To evaluate and compare the impact of publications more complexly than descriptive methods, evaluation methods such as bibliographic maps, bibliographic networks and bibliographic coupling are applied. Descriptive methods i.e. country, institution, author, and journal are simpler than assessment methods, such than bibliographic informative description. Descriptive methods can be used to make simple comparison, while evaluative methods can be used to understand and interpret the impacts of the publications (McBurney and Novak, 2002).[6]

5. Conflict of Interest

The authors declare that there is no conflict of interest.

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