Chapter 3

Bibliometric Analysis of Reconfigurable Antennas in Radar Applications:
Trends, Influential Authors, and Future Directions

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ABSTRACT

This study conducts a comprehensive bibliometric analysis of research articles on reconfigurable antennas in radar applications retrieved from Google Scholar databases from 1989 to 2024. A total of 980 research articles are analysed, demonstrating significant interest and commitment to the topic, as evidenced by a total of 22.073 citations. Important metrics such as citations per year (649.21), citations per article (22.52), and citations per author (9,529). It highlight the importance and impact of research in this area. Collaboration is common, with an average of 410.95 articles per author and about three authors per article. The geographical analysis highlights the contributions of institutions in the United States and Switzerland. The study identifies emerging trends and future directions and highlights the need for dynamic antenna reconfiguration techniques, integration challenges, and energy-efficient solutions. The bibliometric analysis gives valuable insights into the current investigation landscape on reconfigurable antennas for radar applications.

1. INTRODUCTION

Bibliometric analysis is one of the techniques applied for evaluation and analyse the academic literature along with the desired field or any scientific discipline (Donthu et al., 2021). These methods underpin the quantitative analysis of publications, such as journal articles, conference papers, and patents so as to determine the trends, key contributors, research gaps, and impacts on research in a particular area (Xiao & Hao, 2021; Yu & Hayes, 2018). In the context of reconfigurable antennas in radar applications, bibliometric analysis plays crucial role due to the myriad of reasons (Haider et al., 2013; Motovilova & Huang, 2020; Iqbal et al., 2019). Bibliometric analysis paves the way for identifying the current trends and emerging technologies within the field of reconfigurable antennas for radar applications. This analysis contributes to the exploration of new design methodologies, materials, and signal processing techniques. Addition to this, by analysing the literature, researchers and scientists are able to visualize and outline the research landscape in terms of geographical distribution, collaboration networks, and institutional contributions (Dixit et al., 2020; Shevada et al., 2020). This information is paramount to understand the global impact of research in the field (Raut et al., 2021). Bibliometric analysis allows researchers to identify key contributors to the field, including authors, institutions, and research groups. This information is also useful for collaboration opportunities and for recognizing expertise in specific subfields. Focusing on the citation impact of research papers provides insights into the influence of specific studies and methodologies. Highly cited papers often indicate important contributions to the field and can be used to gauge the overall impact of a particular research topic. Bibliometric analysis allows for benchmarking and comparative analysis of different approaches and technologies. Researchers can assess the performance of various reconfigurable antenna designs in radar applications based on their publication and citation metrics. By analysing the existing literature, researchers can identify gaps in knowledge and potential areas for future research. This helps guide researchers in focusing on unexplored aspects and advancing the state-of-the-art in reconfigurable antennas for radar applications. Policymakers and funding agencies can use bibliometric analysis to make informed decisions about resource allocation and policy development. Understanding the research landscape helps in directing funding towards areas with significant potential and impact (Kounta et al., 2022). In summary, bibliometric analysis plays a crucial role in providing a systematic and data-driven understanding of the state of research in reconfigurable antennas for radar applications. It aids researchers, institutions, and policymakers in making informed decisions, fostering collaboration, and advancing the field.

The use of the "Publish or Perish" software developed by Professor Anne-Wil Harzing in a study to analyse existing literature offers a reliable method for carrying

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