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The Impact of Data Science on Geography: A Review

Authors : Roberto Machado

Abstract : We conducted a systematic review using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses methodology, analyzing 2,996 studies and synthesizing 41 of them to explore the evolution of data science and its integration into geography. By employing optimization algorithms, we accelerated the review process, significantly enhancing the efficiency and precision of literature selection. Our findings indicate that data science has developed over five decades, facing challenges such as the diversified integration of data and the need for advanced statistical and computational skills. In geography, the integration of data science underscores the importance of interdisciplinary collaboration and methodological innovation. Techniques like large-scale spatial data analysis and predictive algorithms show promise in natural disaster management and transportation route optimization, enabling faster and more effective responses. These advancements highlight the transformative potential of data science in geography, providing tools and methodologies to address complex spatial problems. The relevance of this study lies in the use of optimization algorithms in systematic reviews and the demonstrated need for deeper integration of data science into geography. Key contributions include identifying specific challenges in combining diverse spatial data and the necessity for advanced computational skills. Examples of connections between these two fields encompass significant improvements in natural disaster management and transportation efficiency, promoting more effective and sustainable environmental solutions with a positive societal impact.

Keywords : data science, geography, systematic review, optimization algorithms, supervised learning
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