

Ecological research with artificial intelligence and machine learning in Asia

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June 26, 2023

Abstract

The use of artificial intelligence (AI) and machine learning (ML) has significantly enhanced ecological research in Asia by improving data processing, analysis, and pattern extraction. Analyzing 1550 articles, I show an overview of the use of AI and ML for Asian ecological research. Following the last 20 year trend, I found that the topics in Asian ecological research have transitioned from technical perspectives to more applied issues, focusing on biodiversity conservation, climate change, land use change, and societal impacts. Non-Asian countries, on the other hand, have focused more on theoretical understanding and ecological processes. The difference between Asian and non-Asian regions may have emerged due to the ecological challenges faced by Asian countries, such as rapid economic growth, land development, and climate change impacts. In both regions, deep learning related technology has been emerging (e.g. big data collection including image and movement). Within Asia, China has been the Asia-leading country for AI/ML applications followed by Korea, Japan, India, and Iran. The number of computer science education programs for education in China has been increasing 3.5x times faster than that in the U.S., indicating that a nationwide strategy for computer science development is key for ecological science with AI. Overall, the adoption of AI and ML technologies in ecological studies in Asia has propelled the field forward and opened new avenues for innovative research and conservation practices.

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