Mapping Vegetation Distribution and Diversity: Integrating Artificial Intelligence with Cultural Perspective

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Abstract

Understanding vegetation distribution and diversity is essential for conserving biodiversity, managing ecosystems, and addressing the challenges posed by climate change. Vegetation patterns are influenced not only by environmental factors but also by cultural practices that shape the use and preservation of plant species. This paper explores the integration of artificial intelligence (AI) in vegetation studies, highlighting its role in mapping, analyzing, and predicting vegetation patterns. By employing AI-driven tools such as machine learning algorithms, remote sensing, and Geographic Information Systems (GIS), researchers can efficiently process large datasets to identify vegetation types, monitor changes, and understand their cultural significance. Case studies illustrate how AI has enhanced the documentation of vegetation diversity and its cultural correlations. This interdisciplinary approach underscores the potential of AI to provide innovative solutions for ecological research while preserving the cultural context of vegetation distribution. Ethical considerations and the need for inclusive collaboration between ecologists, AI experts, and local communities are also necessary to ensure sustainable and culturally sensitive outcomes.