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The role of Semantic web in Biodiversity data management

Abstract:

The biodiversity research discipline studies the totality and variability of organisms, their morphology and genetics, life history and habitats, and geographical ranges (Srivastava, 2011) . Biodiversity is usually used to refer to biological diversity at three levels: genetics, species, and ecology. The current rapid loss of biodiversity is cause for alarm. Biodiversity has a great and direct impact on human life and the survival of mankind. It affects our access to clean water, food, fuel, medical drug compounds, and animal feed. It is thus crucial to raise awareness for the importance of biodiversity and to develop methods to better understand and preserve it. Globally, a number of initiatives, such as the Convention on Biological Diversity (CBD) , the Intergovernmental Platform on Biodiversity (IPBES) , have been undertaken. These initiatives require scientific research into primary biological, chemical, and physical processes to develop predictive models and inform strategic decisions. To achieve these goals, reliable and constant biodiversity data should be made available in a consistent way. Biodiversity Informatics is the application of informatics techniques to biodiversity data for improved management, presentation, discovery, exploration and analysis. It is clear that improved discovery and accessibility of biodiversity data helps addressing both scientific and social issues. Furthermore, it is essential for informed decisions for sustainable development of biotic resources.

To deal with these heterogeneous datasets, a set of data management techniques should be applied. The semantic web enhances data exchange, discovery, and integration by providing common formats to achieve a formalized conceptual scheme. Therefore, in this presentation, we are going to draw links and relationships between Semantic web and its roles in managing biodiversity data. In this talk, we first demonstrate the importance of semantics in biodiversity data management, we then survey current approaches proposed so far, focusing on our own development in this direction. After that we are going to demonstrate the links between machine learning and data integration. Finally, we also aim to describe the future trends and research issues still need to be faced.

Novel Computational Approaches for Environmental Sustainability

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Keynote talk

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