Semantically Enabling Next Generation Environmental Informatics Portals

by

Ping Wang

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Approved:

Deborah L. McGuinness, Thesis Adviser

Rensselaer Polytechnic Institute
Troy, New York

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ABSTRACT

Environmental informatics web portals, which have environmental information systems as back end and web portals as front end, can be used as the right platform to enable both professionals and citizens better utilize environmental data and investigate environmental problems. We present a semantic technology-based approach for building environmental informatics portals, and deployed the approach in the Tetherless World Constellation's Semantic Ecology and Environment Portal (SemantEco). The exemplar portal captures the semantics of domain knowledge using a family of modular simple ontologies, integrates environmental data from multiple sources following Linked Data principles, and infers environment pollution events using OWL2 inference. The portal captures provenance, and leverages provenance in multiple ways, including data lineage rendering, provenance-based facet generation, and validation over the integrated data via SPARQL. We then describe the implementation which has been built out in the domain of water quality monitoring, and highlight some of the potential extensions and enhancements for future semantically-enabled environmental informatics portals.