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Toward a Unified Terrain Ontology

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Ontology design patterns (ODPs) are a pragmatic way to capture domain concepts in small modules to promote reusable and easily comprehensible representation of domain knowledge. We have created two ODPs (encoded as OWL ontologies) primarily to understand the ontology(ies) of terrain features. The Surface Network ODP (SNODP) was created to formalize surface network theory, which we believe is the one of the simplest and terrain ontologies that can be used across domains. Since surface networks provide a way to describe the shape of surfaces in terms of discrete and topologically connected shape elements, SNODP is also important for sharing terrain surfaces on the Semantic Web. The Surface Water ontology design pattern (SWODP) was developed as a conceptual building-block for more complex or specialized surface water ontologies. A fundamental distinction is made in this ontology between landscape features that act as containers (e.g., stream channels, basins) and the bodies of water (e.g., rivers, lakes) that occupy those containers. In this talk we will discuss our vision of how these two ODPs should complement each other and explore the extent to which they can be aligned with each other and possibly with an upper level ontology. A third ontology of voids for hydro ontology proposed by another group of researchers will also be discussed. The goal of combining the three ontologies is to realize a unified terrain ontology that can be used as a mid-level ontology for comparing the various possible terrain ontological commitments people may possess.

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