

A Study of Instance-level Geographic Knowledge Inference Framework

Tan Yongbin, Zhu Haihong and Li Lin

Wuhan University, China

Abstract. On earth, at least 60% of all information contains some geospatial reference. Geography elements are becoming important components of daily information one deals. Many researches about geographic knowledge in present, mainly focused on concept-level analyses, including concept formalization, concept inference applications, etc. BUT how to turn meaningful geographical data into actionable output for non-geographic domain users, has become an increasingly hot research area, as geographical data resources continuously enrich. The objective of this paper is to provide a case-solution for geographical data-mining and processing for non-geographic domain users.

In this paper, a Geography Instance Knowledge Inference (GIKI) framework was present based on geographic concepts semantic and relationships network. The geographic concepts were classified two classes: atomic concept and composite concept. An atomic concept relates geographic instance directly. While a composite concept relates a geographic instance indirectly based on concept semantic relationships extracted with domain experts' knowledge according to the concept definition or related mathematical models. Therefore, a concepts and relationships network was built as a geographic information knowledge base devoted to non-geographic domain users. Finally, intrinsic features of a specified concept, such as the semantic relationship, related concepts, etc., would be obtained from this knowledge-base to support the geographic instance inference in the GIKI.

Based on the proposed framework, a prototype was implemented to demonstrate how knowledge-based geographical instance reasoning architecture can contribute to the development of geographic intelligent applications in support for interdisciplinary geographic information interoperable researches.

Keywords. geographical knowledge, ontology, inference, geographical instance