

On the Role of Conceptual and Linguistic Ontologies in the Production of Wayfinding Dialogues

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Over the last ten years, various standards for the representation of generated wayfinding instructions have been proposed in the Geographic Information Science (GIS) literature [1,2,3]. The more advanced of these standards specify wayfinding information types which may be rendered to users at various levels of granularity, and in multiple modalities. While necessary and sufficient for the present generation of GI services, the integration of wayfinding strategies with more general cognitive and mobility assistance systems will require that such descriptive standards be anchored within, or at least related to, other elements of a cognitive assistance framework.

To progress us towards this goal, in this talk we analyse the ontological foundations of multimodal wayfinding description standards and relate these to the state of the art in both linguistic and conceptual ontologies. Linguistic ontologies provide an interface with rich natural language processing resources, while conceptual ontologies provide a means by which the wayfinding structures can be directly related to other aspects of spatial modelling - including the spatial structures against which route instructions are generated. We report on our progress in this area, and on the relationship between wayfinding description standards and the needs of the route interpretation community. Our analysis focuses in particular on the notion of action, place, and direction as used within wayfinding description standards. The analysis presented is part of ongoing work into the integration of the state of the art in intelligent wayfinding description methods with ontologically well motivated cognitive dialogue systems.

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2. R. Dale, S. Geldof, and J.-P. Prost. Using natural language generation in automatic route description. *Journal of Research and Practice in Information Technology*, 37(1):89–105, 2005.
3. A. Klippel, S. Hansen, K.-F. Richter, S. Winter. Urban granularities - a data structure for cognitively ergonomic route directions. In *GeoInformatica*. to appear (available as online first).