

Location Privacy Control in UbiComp with An Ontology

Privacy control based on location granularity ontologies

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Abstract

One promising approach to user control of privacy in ubiquitous computing can be based on different levels of granularity. So, for example, Alice may be happy for Bob to know her location at the finest granularity available while she is only willing to allow Carol to know at a coarser grain. This paper describes an approach which exploits the structured and hierarchical nature of MIBO, an ontology on location privacy control in a UbiComp environment. We describe the approach underlying the construction of an MIBO ontology for an indoor space, such as a building. This is a semi-automated approach, based on an upper ontology and an XML-based map of a building.

We also describe the Accretion/Resolution reasoning approach that makes use of ONCOR for its personalization of the reporting about a user's location, by varying the granularity of the value reported: this provides a flexible means for a person to control their location privacy and yet make it available as they wish for different people. A prototype has been built to demonstrate how an ontology-based Accretion/Resolution reasoning approach can be configured to present location information in a desired level of granularity with reliable accuracy.