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A Situation-Centric, Knowledge-Driven Requirements Elicitation Approach Using the MTL Method

Human factors have been increasingly recognized as one of the major driving forces of requirement changes. We believe that the requirements elicitation (RE) process should largely embrace human-centered perspectives, and this work focuses on changing human intentions and desires over time. To support software evolution due to requirement changes, Situ framework has been proposed to model and detect human intentions by inferring their desires through monitoring environmental and human behavioral contexts prior to or after system deployment. Researchers have reported that Situ is able to infer users’ desires with high accuracy using the Conditional Random Fields method. However, new intention detection and new requirements elicitation still sorely depend on manual analysis.

This work attempts to find a computable way to detect users’ new intentions with minimal help from human oracle. We discuss the feasibility of implementing the concept of Data-Information-Knowledge-Wisdom (DIKW) to bridge the gap between user behavioral & contextual data and requirements, and propose a situation-centric, knowledge-driven requirements elicitation approach using the Multi-strategy, Task-adaptive Learning (MTL) method. A case study shows that the proposed approach is able to detect users’ new intentions, and is especially effective to capture alternatives of low-level task. We also demonstrate how easily these newly-discovered intentions can be fused to existing domain knowledge, and harvest high-level wisdom, in terms of new requirements and design insights.