

Graduiertenkolloquium Angewandte Informatik

Event Processing and Stream Reasoning with ETALIS

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Abstract

Event Processing (EP) is concerned with detection of near real time situations that are of a particular business interest. We face today a paradigm shift toward the real time information processing, and EP has therefore spawned significant attention in science and technology. Due to omnipresence of events, EP is becoming a central aspect of new distributed systems such as cloud computing and grid systems, mobile and sensor-based systems, as well as a number of application areas including financial services, business intelligence, social and collaborative networking, click stream analysis and many others.

However, there are a number of issues to be considered in order to enable effective event-based computation. A language for describing event patterns needs to feature a well-defined semantics. It also needs to be rich enough to express important classes of event patterns. Pattern matching should be supported in both, query-driven and event-driven modes. A number of other event operations, such as event aggregation, filtering, translation, enrichment and splitting, should be supported too. Since EP is a real time processing task, an EP language needs to feature an efficient execution model. Finally, processing only events is not sufficient in many applications. To detect complex situations of interest, EP needs to be enhanced by background knowledge. This knowledge captures the domain of interest. Its purpose is to be evaluated during detection of events in order to on the fly enrich events with relevant background information; to detect more complex situations; to reason about events and propose certain intelligent recommendations; or to accomplish event classification, clustering, filtering and so forth.

We present the ETALIS Language for Events (ELE), which is a declarative rule-based language for EP. It supports the above mentioned features, and goes beyond the state of the art by providing stream reasoning capabilities. In this work, we identify requirements for modern EP systems. Then we present ELE as a novel expressive formalism that fulfils these requirements. Further on, we show how deductive stream reasoning capabilities of ELE, together with its EP capabilities, have the potential to provide powerful real time intelligence. We give a few extensions of the core ELE. We provide a prototype implementation of the language, and present evaluation results for a few implemented scenarios. Finally, we summarise the results of this work and outline our view of the emerging future work.

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Veranstalter: Institut AIFB, Forschungsgruppe Wissensmanagement

Zu diesem Vortrag lädt das Institut für Angewandte Informatik und Formale Beschreibungsverfahren alle Interessierten herzlich ein.

Andreas Oberweis, Hartmut Schmeck, Detlef Seese, Wolffried Stucky, Rudi Studer (Org.), Stefan Tai