Data management in connected environments

Richard Chbeir[*]

[*]*Universite de Pau et des Pays de l'Adour, Anglet, France*

Abstract: Nowadays, connected environments impact various application domains (e.g., energy management, environment monitoring) by offering users a wide array of applications that help them in their everyday lives (e.g., reducing energy wastes in buildings, monitoring air or noise pollution levels in a city). Although these applications seem different, they all rely on an environment, its sensor network, and sensed data in order to detect and handle specific events (e.g., energy waste, traffic congestion, high level of noise, bad air quality). The differences lie in the definition of the targeted events (e.g., high noise different from traffic congestion event), the application domain (e.g., environmental, energy), the sensors/data required for the detection of the events, and the chosen technique for event detection. Event Query Languages (EQL) have been proposed in connected environments to allow users the definition of targeted events. However, existing languages are limited to the definition of event patterns and suffer from the following drawbacks: (i) no consideration of environment, sensor network, and application domain related components; (ii) lack of provided query types (functionality) required for the definition/management of the entire connected environment; (iii) lack of considered data and datatypes (e.g., scalar, multimedia) needed for the definition of specific events; (iv) lack of considered functionality when expressing spatial/temporal constraints; and (v) difficulty in coping with the dynamicity of the environments. To address the aforementioned limitations, I will present in this talk an EQL specifically designed for connected environments, denoted EQL-CE. I will detail its framework, the used language, syntax, and queries. EQL-CE is re-usable and generic. It allows the definition of various connected environment components, offers various query types for data management, and considers various datatypes. I will also present the query optimizer that handles the dynamicity of the environment and spatial/temporal constraints.

1. Short Biography

Richard Chbeir received his PhD in Computer Science from the University of INSA DE LYON-FRANCE in 2001and then his Habilitation in Leading Research degree in 2010 from the University of Bourgogne. He is currently a Full Professor in the Computer Science Department at the University of Pau & Pays de l'Adour in Anglet France. He is the head of OpenCEMS industrial Chair (https://opencems.sigappfr.org/). His current research interests are in the areas of Data management, Data semantics, and digital ecosystems. Richard Chbeir has published in international journals, books, and conferences, and has served on the program committees of several international conferences. He is currently the Chair of the French Chapter ACM SIGAPP.

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