Preface

Ambient intelligent applications do not necessarily have the luxury afforded traditional software applications of "knowing" by design in which situations they are to function. Because of the ever-changing nature of the world with which these systems interact, they have to dynamically adapt their behaviour in run time. To do this, they must be able to interpret the environment in which they are situated and adapt their behaviour accordingly.

From an intelligent systems perspective, one of the challenges is to integrate context with other types of knowledge as an additional major source for reasoning, decision-making, and adaptation to form a coherent and versatile architecture. There is a common understanding that achieving desired behaviour from intelligent systems will depend on the ability to represent and manipulate information about a rich range of contextual factors. These factors may include not only physical characteristics of the task environment, but many other aspects including cognitive factors such as the knowledge states (of both the application and user) or emotions, and social factors such as networks, relations, roles, and hierarchies. This representation and reasoning problem presents research challenges to which methodologies derived from areas such as artificial intelligence, knowledge management, human-computer interaction, semiotics and psychology can contribute solutions.

The Modelling and Reasoning in Context (MRC) workshop series aims to provide a continuing forum for scientists and practitioners exploring modelling and reasoning issues and approaches for systems using context in a broad range of tasks, to share their problems and techniques across different research and application areas. The series aim to facilitate both the presentation of state-of-the-art research as well as interactions through formal and informal discussions.

This year's workshop, the sixth in the MRC series, is being held in conjunction with the 19^{th} European Conference on Artificial Intelligence (ECAI 2010) in Lisbon, Portugal. We received eight submissions for the workshop, each of which has been reviewed by at least three programme committee members. The committee decided to accept the following six papers for presentation and inclusion in the proceedings.

Models of context are an important issue, both when conveying information about situations and when systems are to reason about the current state of the world. The context of a developer can be viewed as a rich and complex network of elements across different dimensions that are not limited to the work developed in an IDE. Bruno Antunes, Francisco Correia and Paulo Gomes propose the definition of a software developer context model that takes all the dimensions that characterise the work environment of the developer into account.

One of the basic problems in knowledge representation and knowledge engineering is the impossibility of writing globally true statements about realistic problem domains. Multi-context systems (MCS) are a formalisation of simulta-

neous reasoning in multiple contexts. Tarek R. Besold and Stefan Mandl propose a multi-context system framework implementation, lining out the main functions and working principles.

Detecting context features is an essential aspect of context reasoning but has mostly focused on the quality of the detection rather than the benefits of context-based applications for the user. Robert Lokaiczyk, Andreas Faatz, Benedikt Schmidt, and Matthäus Martynus present the results of a case study focusing on usability issues which evaluates algorithms to detect three subtypes of user goals in knowledge work.

Movement recognition constitutes a central task in home-based assisted living environments and in many application domains where activity recognition is crucial. Well established movement recognition methods lack advanced knowledge representation and reasoning capacities that may help understanding through contextualisation. Alessandra Mileo, Stefano Pinardi, and Roberto Bisiani investigate how a lexical approach to multi-sensor analysis can be combined with answer set programming to support movement recognition. A semantic notion of contextual coherence is formalised and qualitative optimisation criteria are introduced in the reasoning process.

Situation identification methodologies in pervasive computing aim to abstract low level context data into more meaningful high level contexts for use by context-aware application developers and users. However, it is not possible to apply a single technique to a wide range of applications. Olga Murdoch and Paddy Nixon propose a unifying framework for existing situation identification methods that will automatically select the best techniques for a given application.

Disappearing computer systems is a notion comprising computer systems, applications, and appliances related to ubiquitous, pervasive, or ambient computing which blend more or less seamlessly into the user's natural environment. Such systems lack certain cues regarding their inner workings that could cause defects and inaccuracies in the mental models built by their users. In order to identify the nature of these defects, understand their effects on human-computer interaction and develop means of avoiding them, Felix Schmitt, Jörg Cassens, Martin C. Kindsmüller, and Michael Herczeg describe an ambient, context-aware computing framework to generate and test hypotheses within an action research paradigm.

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