

Preface

We have now entered an era where technology is being embedded transparently and seamlessly within our surrounding environments. This is being driven by decreasing hardware costs, increased functionality and battery life along with improved levels of pervasiveness. With such a technology rich paradigm we are now witnessing for the first time intelligent environments with the ability to provide support within our homes, the community and in the workplace. The knock-on effect has an impact on both improved living experiences within the environment along with increased levels of independence.

At a general level we can decompose the construct of an intelligent environment into three main components. In the first instance we have the core sensing technology which has the ability to record the interactions with the environment. These may be in the form of for example video, contact sensors or motion sensors. A data processing module has the task to infer decisions based on the information gleaned from the sensing technology and with the third and final component providing the feedback to those within the environment via a suite of multi-modal interfaces. It has been the aim of this text to focus specifically on the data processing module, specifically focusing on the notion of activity recognition.

Within the domain of intelligent environments some may have the view that the process of activity recognition forms the critical path in providing a truly automated environment. It is tasked with extracting and establishing meaningful activities from a myriad of sensor activations. Although work in this area is still deemed to be emerging, the initial results achieved have been more than impressive.

This text represents a consolidation of 14 Chapters presenting leading research results in the area of activity recognition. The material addressed ranges from collective state-of-the-art reviews, to probabilistic and ontological based reasoning approaches to specific examples in the areas of assistance with activities of daily living.

The text is intended for those working within the area of intelligent environments who require a detailed understanding of the processes of activity recognition along with their technical variances. The inclusion of specific case studies assists with the further contextualisation of the theoretical concepts which have been introduced.

We would like to take this opportunity to thank all of the Authors for their timely contributions in provision of their Chapters in both initial and revised formats along with all of the dedicated efforts provided by those who undertook to review the material. We would also like to express our gratitude to Ismail Khalil who providing the inspiration to undertake this Project and provided continual motivation and advice throughout. We would also like to thank Atlantis Press for supporting the text and also for their help in producing the final version of the text.

We hope that the text becomes a valuable reference source within the field of activity recognition and assists in further progress the translation of research efforts into tangible large scale intelligent environments that we can all benefit from.

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