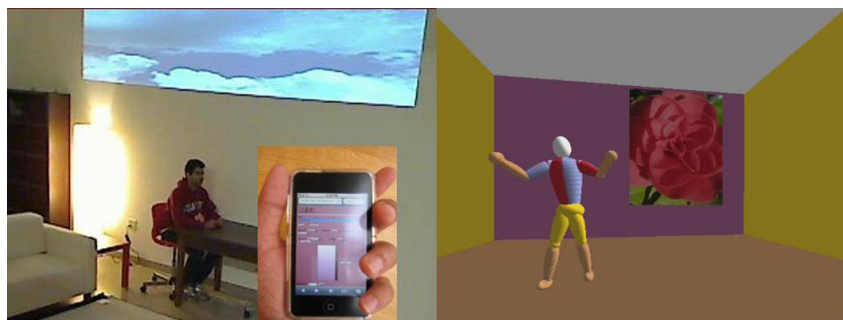




Multi-Camera Vision:

From Sensor Networks to Smart Environments & Ambient Intelligence

- 18–19 November 2010
- Prof. Hamid Aghajan, Stanford University
- Adelaide
- AU\$1320 (includes GST)



Course Description

This course presents ideas and techniques for human-centric application development based on visual input. A number of applications in smart environments, ambient intelligence, and social network settings are discussed in which the vision processing task involving the recognition of user activities is linked with other processing modules in charge of higher-level interpretation or user behavior modeling.

The notion of employing contextual data is examined through examples in which prior information can assist vision processing to function more effectively.

Case studies in algorithm development for human pose analysis based on smart cameras are discussed to illustrate the relationship between application requirements and available processing resources. Context-aware and user-adaptive methods for light and ambience control services in smart homes, exercise monitoring and experience sharing using avatars, speaker assistance systems, and automated environment discovery based on user interaction will be presented to demonstrate example applications..

Target Audience

The course can be useful for researchers and engineers dealing with human-centric application development based on visual input and for graduate students interested in this area.

Assumed Knowledge

An engineering, science or similar degree.

Course Details

Smart Environments and Ambient Intelligence

- Smart environments are spaces that sense, perceive, and react to the presence, commands, or observed events of their occupants
- They offer services such as multimedia, home control, or pervasive communications, as well as accident detection and well-being applications
- Ambient intelligence refers to endowing such systems with unobtrusive and intuitive interfaces

User-centric Design and Social Networks

- A user-centric design paradigm in creating vision-based applications considers the user acceptance and social aspects of the intended solution
- Allows adaptation to the user's set of preferences and behaviour model, seamless and intuitive interfaces, automated setup and configuration, ease of use, awareness of the context, and responsiveness to the user's privacy options
- Provides novel opportunities in application development for smart homes, offices, seminar rooms, automotive, health-care and well-being domains, and experience sharing in social networks

Context-based Processing

- Interpreting an event often requires additional contextual information
- Sources of context can be categorized as environmental or user-centric context.

- Environmental context refers to information derived from domain knowledge or from concurrently sensed effects in the area of operation
- User-centric context refers to information obtained and accumulated from the user

Interfacing Vision and other Layers

- In addition to the inherent complexities, setup and calibration requirements have challenged the creation of meaningful applications that can operate in uncontrolled environments
- User acceptance criteria such as privacy management and the implications in visual ambient communication also hinder the roll-out of vision-based applications
- Processing of visual output often consists of instantaneous measurements such as location and pose, enabling the vision module to yield quantitative knowledge to higher levels of reasoning
- Extracted information is not always flawless and often needs further interpretation at a data fusion level
- Most ambient intelligence applications depend on qualitative knowledge accumulated over time requiring proper interfacing of vision to high-level reasoning

Smart Camera Networks

- Design of scalable, network-based applications employing high-bandwidth data such as multi-source video calls for a change of paradigm in the processing methodology from central to distributed methods.

Teaching Arrangements:

The course will be conducted from 9.00 am to 5.00 pm. Morning tea, lunch and afternoon tea will be provided.

For further info please contact
Anne-Marie Eliseo +61 8 8343 8710
or email industryeducation@nicta.com.au

How to Register:

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from imagination to impact

About the Presenter



Hamid Aghajan is a professor of Electrical Engineering (consulting) at Stanford University since 2003, where he is the director of the AIR (Ambient Intelligence Research) Lab and Wireless Sensor Networks Lab.

Areas of research in his group consist of multi-camera networks and human interfaces for smart, vision-based reasoning environments, with application to smart homes, occupancy-based services, assisted living and well being, smart meetings, and avatar-based communication and social interactions.

Hamid is co-editor-in-chief of the Journal of Ambient

Intelligence and Smart Environments. He has co-authored 3 edited volumes on: Human-centric Interfaces for Ambient Intelligence, Multi-Camera Networks & Principles and Applications, and Handbook of Ambient Intelligence and Smart Environments

He has been editorial board member of the book series on Artificial Intelligence and Smart Environments by IOS Press, associate editor of Machine Vision and Applications, guest editor of IEEE Trans. on Multimedia special issue on Multimodal Affective Interaction, guest editor of IEEE J-STSP special issue on Distributed Processing in Vision Networks, and guest editor of CVIU special issue on Multimodal Sensor Fusion.

Hamid obtained his Ph.D. degree in electrical engineering from Stanford University in 1995.

http://wsnl.stanford.edu/hamid.html



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Conference Centre Technology Park, Mawson Lakes, SA

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