Prof. Bernt Schiele

Department of Computer Science
ETH Zurich (Federal Institute of Technology)
Haldeneggsteig 4, IFW B26.1
CH-8092 Zurich
Switzerland

Web: *www.vision.ethz.ch/schiele/* und *www.vision.ethz.ch/pccv/*
E-mail: *schiele@inf.ethz.ch*
Tel: +41 1 632 06 68
Fax: +41 1 632 15 96

Biography

Bernt Schiele is assistant professor at the computer science department of ETH Zurich (Swiss Federal Institute of Technology). He studied computer science at the University of Karlsruhe, Germany. He worked on his master thesis in the field of robotics in Grenoble, France, where he also obtained the "diplome d'etudes approfondies d'informatique". In 1994 he worked in the field of multi-modal human-computer interfaces at CMU, Pittsburgh, PA, USA in the group of Alex Waibel. In 1997 he obtained his PhD from INP Grenoble, France under the supervision of Prof. James L. Crowley in the field of computer vision. The title of his thesis was "Object Recognition using Multidimensional Receptive Field Histograms". Between 1997 and 1999 he was been with the group of Prof. Alex Pentland at the MIT Media Laboratory, Cambridge, MA, USA.

Research Overview

Perceptual Computing in general and Computer Vision in particular have great potentials to change the way we interact with computers and how machines such as robots perceive the outgoingworld. Over the last three decades significant progress has been made in computer vision. Robustness of perception and vision algorithms however is a notorious problem and one of the major bottlenecks for industrial applications. At the same time there is little doubt that in the next decades small and inexpensive sensors will be developed and embedded in many devices. Our hypothesis is that the integration of multiple features and sensors facilitates robustness in environments of realistic complexity.

The research themes of our group are consequently concerned with the development of methods for the integration of different vision models and sensor modalities. A first research focus is the robust combination of different visual cues and models in the context of object recognition and classification. As a second research focus we develop vision systems since any vision algorithm and in particular integration should be always evaluated from a complete system's perspective. As a third research direction, multi sensor integration methods are applied to the areas of ubiquitous and wearable computing.

A main focus is therefore to propose methods which are robust and general enough to be used for real-world applications such as ubiquitous and wearable computing. At the same time I am convinced that "sensory augmented computing" (as I call it) may fundamentally change the way we interact with computers [3,4].

As pointed out earlier there is little doubt that future computing devices may have access to a multitude of sensors including cameras. Such sensors may be for example part of many small ubiquitous devices attached to everyday objects such as personal belongings, goods in a store, or parts of a processing chain. In the context of the European project "Smart-Its: Interconnected Embedded Technology for Smart Artifacts with Collective Awareness" we develop perception methods for distributed perception and collective context-awareness. The developed devices - dubbed Smart-Its - can be thought of as the nerve endings to a situated computing backbone serving as a platform for context-aware applications, appliances and artifacts. The "distributed systems" group headed by Prof. Mattern is one of five partners in this project.

The polyproject "Wearable Computing" is a joint effort of five groups at ETH. In this project a highly configurable wearable computer platform is developed. Different sensors (such as cameras and microphones) are used to model and recognize the current context in which the wearer of the system is acting. Such context information will be used to dynamically configure the system. An important challenge is to achieve an optimal compromise between availability of functionality and the consumption of the limited resource battery power. Also it is expected that context-awareness will allow to implement more natural human-computer interactions.

References

Sensory-Augmented Computing: Wearing the Museum's Guide. Bernt Schiele, Tony Jebara, and Nuria Oliver. IEEE Micro, pp 44-52, May/June 2001.

An Interactive Computer Vision System - DyPERS: Dynamic Personal Enhanced Reality System. Bernt Schiele, Nuria Oliver, Tony Jebara and Alex Pentland. In ICVS'99 International Conference on Vision Systems.

Sensory Augmented Wearable Computing and its Potential for Human-Computer Interaction. Bernt Schiele. In HCII, August 2001.

Visual contextual awareness in wearable computing. Thad Starner, Bernt Schiele and Alex Pentland. In ISWC, IEEE International Symposium on Wearable Computing, October 1998.

Recognition without Correspondence using Multidimensional Receptive Field Histograms. Bernt Schiele and James L. Crowley. IJCV - International Journal of Computer Vision. 36(1), p 31-50, January 2000