AUTOMATION & CONTROL INSTITUTE
INSTITUT FÜR AUTOMATISIERUNGS- & REGELUNGSTECHNIK

TECHNISCHE UNIVERSITÄT WIEN
Vienna University of Technology

Einladung zum Vortrag

Recent Advances towards Real-Time Mobile Visual Scene Understanding

von
Prof. Dr. Bastian Leibe

RWTH Aachen
Mobile Multimedia Processing

TERMIN: Dienstag, 27. September 2011, 15:00 Uhr
ORT: Computerlabor, Gußhausstraße 27, 4. Stock, Raum CA 0426, 1040 Wien

ABSTRACT

Visual scene understanding in unconstrained scenarios of daily human living has been one of the main goals of Computer Vision since the field's beginnings. It is also a crucial requirement for many applications in the near future of mobile robotics and smart vehicles. While the general goal still poses considerable challenges, significant progress has been made in the development of individual solutions for the different visual subtasks, such as object recognition, 3D estimation, and tracking. Given this progress, it now becomes possible to combine several of those components in order to build mobile vision systems that can perform dynamic scene interpretation in busy inner-city scenarios. In order to make this progress usable for autonomous robotics applications, it is however necessary to develop algorithms that can also satisfy the real-time processing requirements, as well as the power consumption limitations of robotic systems. In this talk, I will present recent research by our group at RWTH Aachen that addresses this challenge. In detail, I will present several principled solutions to reduce the run-time requirements of the object detection and tracking stages in a mobile scenario by incorporating scene geometry, by trading off detector evaluation over time, and by adopting a hybrid tracking framework. Side results of this effort are a (publicly available) pedestrian detector that runs at 83 fps on a desktop PC (26 fps on a laptop) and a fully-fledged mobile multi-person tracking system running at about 8-10 fps on a single laptop.

BIOGRAPHICAL INFORMATION

Bastian Leibe is an assistant professor of Computer Science at RWTH Aachen University, where he is working in the UMIC Excellence Cluster. He obtained an MS degree in computer science from Georgia Institute of Technology in 1999 and a Diplom degree in computer science from the University of Stuttgart in 2001. From 2001 to 2004, he pursued his doctoral studies at ETH Zurich under the supervision of Prof. Bernt Schiele. He received his PhD degree from ETH Zurich in 2004 with his dissertation on "Interleaved Object Categorization and Segmentation", for which he was awarded the ETH Medal. After a one-year post-doc at University of Darmstadt in 2005, he joined the BIWI computer vision group at ETH Zurich in 2006, where he held a post-doc position until July 2008. Bastian's main research interests include object categorization and detection, especially in combination with 3D estimation and tracking, as well as top-down segmentation. He has been working on the European projects CogVis, CoSy, DIRAC, Hermes, and SCOVIS, and is now principal investigator in the FP7 project EUROPA. Over the years, he received several awards for his research work, including the DAGM Main Prize in 2004, the CVPR Best Paper Award in 2007, the DAGM Olympus Prize in 2008, and the ICRA Best Vision Paper Award in 2009. He serves as a program committee member for the major computer vision conferences ICCV, ECCV, and CVPR and is regularly reviewing for IEEE Trans. PAMI, IJCV, and CVIU.

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