

# Lecture Series

## Winter Term 2015/2016

The Transregional Collaborative Research Center (SFB-TRR) 161 invites all colleagues and interested people to the upcoming Lecture Series. During these events renowned scientists will talk about their research findings in the field of visual computing.

## Quality and Beyond

### Invitation to a talk

within the SFB-TRR 161 Lecture Series

**18-1-2016**

4:30 p.m.

University of Stuttgart  
VISUS-Building  
Allmandring 19, Vaihingen  
Powerwall Room -01.116

University of Konstanz,  
Universitätsstr. 10, Konstanz  
Powerwall C202  
(Live Transmission)

**Hendrik Lensch Eberhard**, Eberhard Karls Universität Tübingen

### Real-time 3D Reconstruction from Videos

In this presentation I will give an overview on the research activities of the computer graphics group at the University of Tübingen on depth reconstruction from videos including structure from motion, SLAM and fast nearest-neighbor search. We propose real-time structure from motion for high spatial and temporal resolution video streams with thousands of frames. The key technical contributions are a robust selection of confident frames, a novel windowed bundle adjustment, robust frame-to-structure verification for globally consistent reconstructions with multi-loop closing, and the utilization of an efficient global linear camera pose estimation that links both consecutive and distant bundle adjustment windows. In order to allow for efficient loop closing we developed a fast high-dimensional nearest neighbor search with significant speed-ups compared to existing libraries. The last part will cover real-time SLAM techniques for robust environment reconstruction and tracking in stereo car videos.

#### About the speaker

Hendrik P. A. Lensch holds the chair for computer graphics at Tübingen University and is head of the computer science department. He received his diploma in computers science from the University of Erlangen in 1999. He worked as a research associate at the computer graphics group at the Max-Planck-Institut für Informatik in Saarbrücken, Germany, and received his PhD from Saarland University in 2003. Hendrik Lensch spent two years (2004-2006) as a visiting assistant professor at Stanford University, USA, followed by a stay at the MPI Informatik as the head of an independent research group. From 2009 to 2011 he has been a full professor at the Institute for Media Informatics at Ulm University, Germany. In his career, he received the Eurographics Young Researcher Award 2005, was awarded an Emmy-Noether-Fellowship by the German Research Foundation (DFG) in 2007 and received an NVIDIA Professor Partnership Award in 2010. His research interests include 3D appearance acquisition, computational photography, global illumination and image-based rendering, and massively parallel programming.

See <http://www.uni-tuebingen.de/fakultaeten/mathematisch-naturwissenschaftliche-fakultaet/fachbereiche/informatik/lehrstuehle/computergrafik/lehrstuhl.html> for more details.