

RESEARCH SEMINAR

Recent Developments in Multi-modal Human-Machine Communication



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Date : 4 Oct 2023 (Wed) Time : 4:00 pm - 5:00 pm Venue : CD303

Abstract

In multi-modal human-machine communication, users interact with machines using different human communication channels, such as e.g. voice, vision or haptics. Therefore, this area is strongly related to research fields such as e.g. speech recognition and computer vision and the fundamental basics for these research fields are nowadays strongly connected to advanced methods in pattern recognition and machine learning.

It is therefore not amazing that human-machine communication benefited strongly from the extremely dynamic development of advanced machine learning methods during the last decade, especially in the well-established area of deep learning. In this talk, a brief overview on the development of classical algorithms in the area of speech recognition and computer vision from traditional statistical methods to nowadays mostly pure neural recognition algorithms is presented and furthermore, some of the recent research outcomes from the author's institution will be introduced, including e.g. face recognition from partial and occluded face information, recognition for low resolution faces, or action recognition including gait identification with graph neural networks. The talk will end with the presentation of a multi-modal recognition task for a multi-party speaker activity detection scenario where advanced deep learning methods are not only employed for single modality recognition but especially for the fusion of audio-visual information to solve a truly multi-modal complex recognition problem.

About the Speaker

Prof. Rigoll obtained the Dipl.-Ing. degree from Stuttgart University/ Germany, in 1982. He joined Fraunhofer-Institute (IAO) in Stuttgart as a researcher in the department of advanced information and communication technologies and received the Dr.-Ing. degree in 1986 in the area of automatic speech recognition. From 1986 to 1988 he worked as postdoctoral fellow at IBM T.J. Watson Research Center in Yorktown Heights/USA on acoustic modeling and speaker adaptation for the IBM Tangora speech recognition system. He received the Dr.-Ing. habil. degree in 1991 from Stuttgart University with a thesis on speech synthesis. From 1991 to 1993 he worked as guest researcher in the framework of the EC Scientific Training Programme in Japan for the NTT Human Interface Laboratories in Tokyo/Japan, in the area of neural networks and hybrid speech recognition systems. In 1993 he was appointed to full professor of computer science at Gerhard-Mercator-University in Duisburg, Germany. In 2002, he joined Technische Universität München (TUM), where he is up to now heading the institute for Human-Machine Communication.



His research interests are in the field of pattern recognition and machine learning for human-machine communication, covering areas such as speech and handwriting recognition, gesture recognition, face detection & identification, action & emotion recognition and interactive computer graphics. Prof. Rigoll is an IEEE Fellow (for contributions to multimodal human-machine communication). He served as Associate Editor for the IEEE Transactions on Audio, Speech and Language Processing from 2005-2008, as member of the Overview Editorial Board of the IEEE Signal Processing Society, Associate Editor of the EURASIP Journal on Audio, Speech and Music Processing, as well as EURASIP Journal on Image & Video Processing, and former member of the editorial board of the journal "Pat¬tern Analysis & Applications". He has been active as project reviewer and proposal evaluator in a variety of national and international projects, sponsored by the European Commission, the German National Science Foundation (DFG), the German Ministry for Research and Education (BMBF), and other research foundations in the UK, The Netherlands, Finland and Switzerland.

Prof. Rigoll has been involved in international research and teaching activities as visiting professor at NAIST in Nara / Japan (2005) and as lecturer at TUM-Asia in Singapore since 2011. He is coordinator for the electrical engineering section of the Chinese-German College for Postgraduate Studies (CDHK) at Tongji-University in Shanghai / China since 2017.

