

**Institut für Signalverarbeitung
und Sprachkommunikation (4420)**

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Invitation for a Guest Lecture

Dear colleagues,

I want to invite you for the following guest lecture by

Prof. Dr.-Ing. Tim Fingscheidt
TU Braunschweig
Germany

**”Acoustic Model Fusion for Phoneme Recognition According
to the Turbo Principle: Towards a New TIMIT Benchmark”**

Wednesday, February 6, 2019 at 11:00 hrs
Seminar Room IDEG134, Inffeldgasse 16c/ground floor

Please forward this invitation to colleagues and friends.
Hope to see you all there!

Gernot Kubin

Abstract: Performance of automatic speech recognition (ASR) systems can significantly be improved by integrating further sources of information such as additional modalities, or acoustic channels, or acoustic models. Given the arising problem of information fusion, striking parallels to problems in digital communications are exhibited, where the discovery of the turbo codes by Berrou et al. was a groundbreaking innovation. In this presentation, we show ways how to successfully apply the turbo principle to the domain of ASR and thereby provide solutions to the abovementioned information fusion problem. We will present the turbo decoding forward-backward algorithm (FBA), giving insights into turbo ASR, and providing a new and important limitation of the so-called extrinsic information being passed between the recognizers. We prove the suitability of the turbo fusion approach both for DNN and CNN network topologies, and for magnitude and phase CNN features. On the challenging TIMIT phoneme recognition task, our proposed turbo ASR approach outperforms all published context-independent TIMIT monophone benchmarks, reaching a 16.91% phoneme error rate.

Biography: Tim Fingscheidt received the Dipl.-Ing. degree in electrical engineering in 1993 and the Ph.D. degree in 1998 from RWTH Aachen University, Germany. He further pursued his work on joint speech and channel coding as a consultant in the Speech Processing Software and Technology Research Department at AT&T Labs, Florham Park, NJ, USA. In 1999, he entered the Signal Processing Department of Siemens AG (COM Mobile Devices) in Munich, Germany, and contributed to speech codec standardization in ETSI, 3GPP, and ITU-T. In 2005, he joined Siemens Corporate Technology in Munich, Germany, leading the speech technology development activities in recognition, synthesis, and speaker verification. Since 2006, he is Full Professor at the Institute for Communications Technology at Technische Universität Braunschweig, Germany. His research interests are speech and audio signal processing, enhancement, transmission, recognition, and instrumental quality measures. He received several awards, among them are a prize of the Vodafone Mobile Communications Foundation in 1999 and the 2002 prize of the Information Technology branch of the Association of German Electrical Engineers (VDE ITG). In 2017, he co-authored the ITG award-winning publication, but the ITG prize is only awarded once in a life time. He has been a speaker of the Speech Acoustics Committee ITG AT3 since 2015. From 2008 to 2010, he was an Associate Editor for the IEEE Transactions on Audio, Speech, and Language Processing, and from 2011 to 2018 he served as a member of the IEEE Speech and Language Processing Technical Committee.