University of Rochester
Department of Electrical and Computer Engineering
Colloquia Series

Development of a Parametric Instrument Coder based on Analysis and Re-synthesis of Guitar Recordings

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Wednesday, September 9th
12:00PM – 1:00PM
Computer Studies Building (CSB) 209

Abstract: This presentation introduces a novel algorithm for parametric audio coding of isolated electric guitar recordings. Only the output signal of a common electric guitar is used to provide the basis for this process. With the help of the digitalized audio signal, certain parameters are extracted which on the one hand allow an automated transcription of the played track and on the other hand realize the synthesis of the played track by physical modelling techniques. Thereby a special focus will be set to monophonic and polyphonic pieces as well as common guitar-specific playing techniques. Further contributions of this work are the creation of a novel data set of 261 audio files as well as an evaluation of the resultant coding algorithm using a basic aural MUSHRA testing method to assess the quality of the generated results.

Bio: Gerald Schuller is a professor at the Institute for Media Technology of the Technical University of Ilmenau, since 2008. He was head of the Audio Coding for Special Applications group of the Fraunhofer Institute for Digital Media Technology in Ilmenau, Germany, since January 2002 until 2008, and is now a member of Fraunhofer IDMT. Before joining the Fraunhofer Institute, he was a member of Technical Staff at Bell Laboratories, Lucent Technologies, and Agere Systems, a Lucent Spin-off, from 1998 to 2001. There he worked in the Multimedia Communications Research Laboratory. He received his Diploma degree in Electrical Engineering from the Technical University of Berlin in 1989, and his Ph.D. (Dr.-Ing.) degree from the University of Hanover in 1997, studied at the Massachusetts Institute of Technology in 1989/90 and at the Georgia Institute of Technology in 1993. He was Associate Editor of the IEEE Transactions on Speech and Audio Processing from 2002 until 2006, and the IEEE Transactions on Signal Processing from 2006 to 2009, and of the IEEE Transactions on Multimedia since 2008. He is recipient of the 2006 IEEE Best Paper Award in the Audio and Electroacoustic Area. His research areas are in filter banks, audio coding, music signal processing, and 3D audio and visual object representations.

Pizza and soda will be provided.