

IWR-Colloquium Winter Term 2016 / 2017

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Mathematikon, Conference Room / 5th Floor
Im Neuenheimer Feld 205, 69120 Heidelberg

Speaker:

Prof. Meinard Müller, International Audio Laboratories Erlangen (AudioLabs),
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Title:

"Music Information Retrieval - When Music meets Computer Science"

Abstract:

Significant digitization efforts have resulted in large music collections, which comprise music-related documents of various types and formats including text, symbolic data, audio, image, and video. In the field of music information retrieval (MIR) great efforts are directed towards the development of technologies that allow users to access and explore music in all its different facets. For example, during playback of some CD recording, a digital music player may present the corresponding musical score while highlighting the current playback position within the score. On demand, additional information about melodic and harmonic progression or rhythm and tempo is automatically presented to the listener. A suitable user interface displays the musical structure of the current piece of music and allows the user to directly jump to any key part within the recording without tedious fast-forwarding and rewinding. In this talk, I discuss a number of current research problems in the field of music information retrieval and indicate possible solutions. One fundamental problem is to decompose a given music signal into semantically meaningful components. To guide the decomposition, one may exploit additional information, either in the form of specific acoustic properties of the components or in the form of additional score information. As an example, I show how to compute a notewise decomposition of a music signal by applying a score-informed variant of non-negative matrix factorization (NMF). Finally, I discuss various audio editing and manipulating applications to highlight the potential of these decomposition techniques.

Biography:

Meinard Müller studied mathematics (Diplom) and computer science (Ph.D.) at the University of Bonn, Germany. In 2002/2003, he conducted postdoctoral research in

combinatorics at the Mathematical Department of Keio University, Japan. In 2007, he finished his Habilitation at Bonn University in the field of multimedia retrieval. From 2007 to 2012, he was a member of the Saarland University and the Max-Planck Institut für Informatik leading the research group "Multimedia Information Retrieval and Music Processing" within the Cluster of Excellence on "Multimodal Computing and Interaction". Since September 2012, Meinard Müller holds a professorship for Semantic Audio Processing at the International Audio Laboratories Erlangen, which is a joint institution of the Friedrich-Alexander-Universität Erlangen-Nürnberg (FAU) and the Fraunhofer-Institut für Integrierte Schaltungen IIS. His recent research interests include music processing, music information retrieval, audio signal processing, and motion processing. Meinard Müller has been a member of the IEEE Audio and Acoustic Signal Processing Technical Committee from 2010 to 2015 and is a member of the Board of Directors of the International Society for Music Information Retrieval (ISMIR) since 2009. He has co-authored more than 100 peer-reviewed scientific papers, wrote a monograph titled "Information Retrieval for Music and Motion" (Springer, 2007) as well as a textbook titled "Fundamentals of Music Processing" (Springer, 2015, www.music-processing.de).

Website Prof. Müller:

www.audiolabs-erlangen.de/fau/professor/mueller

Website IWR-Colloquium:

www.iwr.uni-heidelberg.de/iwr-colloquium