Lecture (KV)

<u>Title:</u>	**Ausgewählte Kapitel der Signal- und Informations-verarbeitung: Information Theory – Channel Coding (382.062)**
	https://kusss.jku.at/kusss/selectcoursegroup.action?coursegrou-pid=5268&showdetails=382062&courseclassid=36949#lv382062

<u>Lecturer:</u> **Prof. Dr.-Ing. habil. Dr. h.c. Johannes Huber**
Friedrich-Alexander University Erlangen-Nuremberg

<u>Course Mode:</u> Online videos in German and in English are available
one day exercise course in January 2021
(physical attendance if conditions allow,
more information will follow via KUSSS)

<u>Contents:</u>

This lecture covers the fundamentals and applications of information theory that provide the basis for channel coding for reliable communications and source coding in data compression.

<u>Topics covered:</u>

- Fundamental definitions: information, entropy, mutual information
- Source coding: source coding theorem, lossless compression: Huffman, Tunstall, and Lempel-Ziv
- Entropy and coding for sources with memory, Markov chains
- Channel coding for reliable transmission over communication channels: channel models, channel capacity, channel coding theorem, error probability, cut-off-rate, Gallager's error exponent

<u>Biography:</u>

Johannes Huber received the Dipl.-Ing. degree in electrical engineering from the Technical University of Munich, Germany, in 1977. From 1977 to 1982 he was a research assistant at the Federal Armed Forces University Munich from which he received the Dr.-Ing. degree with a thesis on coding for channels with memory. From 1982 to 1990, he was an Akademischer Oberrat at the same university and received the Dr.-Ing. habil. degree with a thesis on trellis coded modulation. In spring 1991, he joined the IBM Research Laboratory, Zurich, Switzerland. From autumn 1991 until Spring 2017, he was Professor at the Friedrich-Alexander-University Erlangen-Nürnberg, Germany.

His research interests are information and coding theory, modulation schemes, algorithms for signal detection and adaptive equalization for channels with severe intersymbol interference, signaling, detection and equalization or multiple-input multiple-output (MIMO) channels and concatenated coding together with iterative decoding. Johannes Huber is Fellow of the IEEE. In 2008 he was appointed a corresponding fellow of the Royal Society of Edinburgh. Since 2009, Johannes Huber is an ordinary member of the Bavarian Academy of Sciences and Humanities. He served as an Editor-in-Chief and as an Associate Editor for several international journals on information theory and communications.