

interACT Seminar

Prof. Satoshi Nakamura

Information Theory: Source Coding

Information theory is one of the fundamental theories for Informatics. The lecture introduces property of information, definition of information, and real usage of information theory. The lecture is fundamentally based on the concept proposed by Claude Shannon in 1948 but extended to current topics. The original information theory consists of Source Coding Theory and Channel Coding Theory.

This lecture covers Source Coding Theory. Source Coding Theory is the one for data compression and signal-to-noise enhancement according statistical characteristics of the information source.

The goal of the lecture is the understanding of Source Coding by theory and application. The lecture introduces following topics:

- Amount of information, modeling of information source**
- Zero-memory source, Markov source**
- Hidden Markov source, Parameter Estimation**
- Property of codes, Kraft Inequality**
- Source coding theorem, compact codes**
- Universal coding, Dictionary coding**
- Source coding of analog signal, vector quantization**
- Modeling and coding of language and speech**

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FAKULTÄT FÜR INFORMATIK

