20SK – Signals and Codes

Lecture 09 – Coding for discrete data sources, prefix-free codes (2015/11/26)

Topics discussed:

- Important classes of signal sources (continuous, discrete-time and quantized, digital)
- Formal definition of a code
- Fixed-length codes for discrete sources
- Variable-length codes for discrete sources
- Unique decodability
- The Kraft inequality for prefix-free codes

The relevant literature is [1, chapter 2], [2, chapter 2] and [3, section 1.2]. Huffmann coding and arithmetic coding are also described in Wikipedia.

Resources

[1]   Gallager, R.: Course materials for 6.450 *Principles of Digital Communications I*, Fall 2006. MIT OpenCourseWare (http://ocw.mit.edu/), Massachusetts Institute of Technology.

[2]   Adámek, J: *Foundations of Coding: Theory and Applications of Error-Correcting Codes with an Introduction to Cryptography and Information Theory*. Wiley Interscience, 1991, 352 pp.

[3]   Seibt, P.: Algorithmic Information Theory – Mathematics of Digital Information Processing. Springer, 2006, 447 pp.