Universal Data Compression (049043) – Critical Summary

Select a paper for a critical summary from the following list and let me know of your choice as soon as possible (no paper can be chosen by more than one student).

Submit your critical summary by the last day of the semester (July 2, 2013) and then set with me an appointment for the oral discussion on the paper.

General requirements:

The critical summary should be no more than five pages long (including the bibliography; font size ≥ 11pt, margins: ≥ 1cm). First, it should include a concise description of the main results in the paper along with explanations. One is not expected to copy proofs or analytical developments, but is expected to explain the essence of the techniques used therein. Secondly, and this is the critical part, the summary should include, as much as possible, personal observations of the student: intuitive insights, relationships (if exist) with the material of the lectures, comments on the degree of innovation with respect to previous work, technical rigor and correctness, suggestions for improvement, simplification, or generalization of the analysis, and so on.

For the oral discussion, the student should be knowledgeable not only with regard to the paper itself, and its detailed technical aspects, but also on closely related work like the references cited in the paper. Thus, short papers should not necessary be considered more attractive than long ones. Examples of good critical summaries (although in another course – “Coded Communication”) can be found in the moodle site.

List of Papers


(5) P. C. Shields, “Universal almost sure data compression using Markov types,” preprint (can be copied from me).


(22) G. I. Shamir and D. J. Costello, Jr., “Universal lossless coding for sources with repeating
(25) G. I. Shamir, “Universal lossless compression with unknown alphabets – the average case,”
2006.
(28) E.-h. Yang and D.-k. He, “Universal data compression with side information at the decoder
by using traditional universal lossless compression algorithms,” Proc. ISIT 2007, pp. 431–435,
Nice, France, June 2007.
(30) C. Chang and A. Sahai, “Upper bound on error exponents with delay for lossless source coding
on Communication, Control, and Computing, Monticello, IL, October 2004.
Coding,” Proc. Annual Allerton Conference on Communication, Control, and Computing,
Monticello, IL, October 2004.
(34) W. Szpankowski, “Asymptotic average redundancy of Huffman (and other) block codes,”
(35) D. Sheinwald, A. Lempel, and J. Ziv, “Two–dimensional encoding by finite–state encoders,”
(36) L. Györfi, I. Páli, and E. van der Meulen, “There is no universal source code for an infinite

3

(39)-(46) Papers by the following authors, published in the July 2004 issue of the IEEE Trans. Inform. Theory (special issue on problems on sequences): Jacquet and Szpankowski; Kieffer and Yang; Savari; Martín, Seroussi and Weinberger; Orlitsky, Santhanam, and Zhang; Nobel; Meron and Feder; Cai, Kulkarni and Verdú.