S. Borade, B. Nakiboglu, L. Zheng, "Unequal Error Protection: An Information-Theoretic Perspective", IEEE Trans. Inf. Theory, Dec. 2009.

The paper considers data communication at capacity. The focus is on the error probabilities for 2 sets of messages obtained by either partitioning the e^{nC} messages into

(1) 2 sets of equal size or
(2) one set of size e^{nr} where r<C, and the other of size e^{nC}- e^{nr} ≈ e^{nC}. A particularly interesting case is the "red-alert" case where r=0.

Various recent and not-so-recent results are combined to determine the error exponents for cases without feedback (block codes), with feedback (variable length codes), and with erasures. For example, for the feedback problems the authors borrow from work by Burnashev , Berlin et al., and Yamamoto-Itoh. There are 10 Theorems, each one dealing with a different combination of assumptions (case 1 or 2, error probability of set 1 or 2, feedback or no feedback, erasures or not). The optimality of a scheme of Kudryashov is established.

The paper is beautifully organized and written, a pleasure to read. The main results are collected in the first 12 pages, and proofs given in the remaining pages. One of the main contributions of the paper is that it highlights the importance of studying unequal error protection more closely. A second contribution is to develop a particular coding strategy for each case studied.

N. Abedini, S. P. Khatri, S. Savari, "A SAT-Based Scheme to Determine Optimal Fix-free Codes" 2010 Data Compression Conference

The paper describes a branch-and-bound algorithm to find optimal fix-free codes. I am not an expert in this area and cannot judge the contributions properly. However, since the paper was self-nominated and is a conference paper only, I don't think it deserves the same attention as the other papers. I am in full agreement with Muriel's review opinions.

If I compare the papers above with the others I have commented on in this forum (Kim, Tatikonda-Mitter, Cuff-Permuter-Cover) and to the papers for which I served as AE (Polyanskiy-Verdu-Poor and Nair-El-Gamal), my first inclination is to rank them coarsely as follows:

Top Class:
- Borade-Nakiboglu-Zheng
- Polyanskiy-Verdu-Poor
- Cuff-Permuter-Cover

Next Class:
- Kim
- Nair-El-Gamal
- Tatikonda-Mitter

Comment 1: For the Nair-El-Gamal paper, I agree with Max that indirect decoding "has opened up new avenues for establishing rate bounds in connection to the broadcast channel." At the same time, by applying the commonly-use joint decoder one achieves the same rates as the indirect decoder. In this sense, my current understanding of "indirect decoding" is that it is a suboptimal method that is better than another suboptimal method. But joint decoding beats both in general. (I communicated this observation to the authors during the review process.)

Two suggestions:

1) If the Borade-Nakiboglu-Zheng paper is one of the finalists, I suggest to ask for comments from Alex Grant, since he handled it as AE. Of course, a similar comment for other finalist papers. (Hirosuke already commented on the Cuff-Permuter-Cover paper.)
2) Although I handled the Polyanskiy-Verdu-Poor paper as AE, I am not an expert on the intricacies of error bounds and exponents. If this paper is one of the finalists, I suggest to ask for comments from "error bound experts" and in particular Sasha Barg and Simon Litsyn. As a remark, Alexei Ashikhmin and another reviewer helped to review the paper. Alexei was constructive and contributed several improvements (see Theorems 4 and 6 and Fig. 5 and the acknowledgment). The other reviewer was rather critical of the writing and results, this is why I suggest Barg and Litsyn to give additional input, since they did not review the paper).