



Efficient shortened cyclic codes correcting either random errors or bursts

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resumen:

Some channels are affected by errors that cluster into bursts. For instance, a channel like the Elliot-Gilbert channel is bursty in nature. If a code that can correct a burst of length up to b is needed, certainly a b -burst-correcting code can be used. However, such a code is inefficient, since the number of redundant bits would be too high. For that reason, codes designed specifically for correcting burst errors have been created. A well known construction for single burst-correcting codes is given by the so called Fire codes. More efficient constructions based on computer search for specific parameters can be found in the literature. An efficient algorithm for finding the burst correcting capability of a cyclic code is presented. A description of the algorithm used for fast computer searches of the best burst-correcting codes is presented too. Finally, in this paper, we examine a problem that combines the one of finding good burst-correcting codes together with the one of finding good random error-correcting codes. Mainly we want to find efficient codes that can correct either up to t random errors or a burst of length up to b , where $t < b$.

sobre Mario Blaum:

Mario Blaum was born in Buenos Aires, Argentina, in 1951. He received the degree of Licenciado from the University of Buenos Aires in 1977, the M.Sc. degree from the Technion-Israel Institute of Technology, Haifa, in 1981, and the Ph.D. degree from the California Institute of Technology (Caltech), Pasadena, in 1984, all in mathematics. From January to June 1985, he was a Research Fellow at the Department of Electrical Engineering, Caltech. In August 1985, he joined the IBM Research Division at the Almaden Research Center. In January 2003, his division was transferred to Hitachi Global Storage Technologies, where he was a Research Staff Member until February 2009. At present, he is a Software Test Specialist at the IBM Almaden Research Center. Dr. Blaum's research interests include Storage Technology, comprising all aspects of coding and synchronization. He is a Fellow of the IEEE since 2000 and an Associate Editor in Coding for IEEE Transactions on Information Theory since April 2009.