Bit-wise Unequal Error Protection for Variable Length Blockcodes with Feedback

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Abstract:
In various applications sources of varying rates with differing priorities are to be transmitted together through the same channel. Unequal error protection schemes are used in these situations, in order to facilitate better error protection to the more important sources in the expance of less important sources. These problems have been investigated in the framework of coding theory for decades. An information theoretic framework has been suggested more recently which formulates the problem through the decay rates of the error probabilities with block length, i.e. through the error exponents. In this talk we will consider the (multi-layer bit-wise) unequal error protection problem for variable length block codes with feedback. We will establish necessary and sufficient conditions for the achievability of a rate vector and error exponent vector pair for finite expected decoding time. These conditions completely characterise the achievable volume for rate vector-error exponent vector pairs.

Bio:
Barış Nakiboğlu received his B.Sc. in Electrical and Electronics Engineering and in Physics from Middle East Technical University, Ankara Turkey, in June 1998. He worked at Information Technologies and Electronics Research Institute (TUBITAK-BILTEN, now known as TUBITAK-UZAY) from September 2002 to July 2003. He received his M.Sc. in Electrical Engineering and Computer Science in September 2005 and Ph.D in Electrical Engineering in February 2011 both from Massachusetts Institute of Technology (MIT), Cambridge Massachusetts. His research has been focused on point to point communication problems with feedback and information theoretic unequal error protection.

Date and Time: July 13, 2011, Wednesday, 10am

Location: METU, EEE, D114