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Multicasting in Large Random Wireless Networks: Bounds on the Minimum Energy per Bit

Aman Jain, Sanjeev R. Kulkarni, Sergio Verdu.

- Scaling laws for maximal energy efficiency of communicating a message to all the nodes in a random wireless network are studied.
- Information-theoretic lower bound on the minimum E_b for multicasting when the CSIT is not available.
- Upper bound is obtained by constructing a simple flooding scheme.
- Two network models, dense random network and extended random network are considered.

A New Data Processing Inequality and Its Applications in Distributed Source and Channel Coding
Wei Kang, Sennur Ulukus.

- A new data processing inequality on a new measure of correlation through a spectral method is proposed.
- Correlation is defined on singular values of joint distribution matrix between two random variable.
- Data processing inequality is defined on this correlation measure.
- Bounds are obtained on two specific cases, multiple access channel with correlated sources and multi-terminal rate-distortion region.

On the Secure Degrees of Freedom of Relaying with Half-Duplex Feedback
Tung T. Kim, H. Vincent Poor.

- Secure communication protocols over a single-relay system in the presence of a multiple-antenna eavesdropper are investigated.
- When there is no direct link between the source and the destination, an amplifyandforward (AF) protocol that allows both the destination and the source to jam the eavesdropper is shown to achieve secrecy rates that grow linearly with the transmit power in dB
- Performance loss due to presence of direct link is also investigated.

Decentralized Sequential Hypothesis Testing Using Asynchronous Communication
Georgios Fellouris, George V. Moustakides.