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## MULTITERMINAL V. CENTRALIZED ESTIMATION OF CORRELATION COEFFICIENTS

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$(X, Y)$  is a zero-mean, equal-variance bivariate Gaussian vector with an unknown correlation coefficient that we wish to estimate.  $X$  is observed by Agent 1 and  $Y$  is observed by Agent 2. Agents 1 and 2 are unable to communicate with one another, but each can communicate to Agent 3. We consider two extreme cases: In Case A the agents can communicate their observations with perfect accuracy; i.e., this case is classical centralized estimation. In Case B each of Agents 1 and 2 is able to send Agent 3 only one binary digit. In Case A we find the MSE of the ML estimate of the correlation coefficient when it has a uniform prior over  $[-1, 1]$ . In Case B we assume that it is best for each agent to send the sign of his observation. The resulting MMSE estimation error for this situation is found to be about six times larger than that of the abovementioned centralized ML estimate. The results have potential application to neural estimation of the correlation between observations made by two different sensory modalities such as vision and audition.

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