Competitive Mean-Squared Error Beamforming

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- Conventional beamformers typically maximize the signal-to-interference-plus-noise ratio (SINR). However, this may not guarantee a good estimate of the signal.

- We derive beamformers for estimating a signal in the presence of interference and noise using the mean-squared error (MSE) as the performance criterion.

- Challenge: the MSE depends on the signal in the deterministic case, or its power in the stochastic case, both are unknown.

- To solve this problem, we minimize the worst-case regret, i.e. the difference between the true MSE and smallest attainable MSE with a linear estimator that knows the exact model. This results in a low MSE over a wide range of signal values.