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Project: Particle Filters For Multipath Mitigation
Sponsor:

Statement of Work:

In many signal processing problems, one is unable to characterize certain components of the modeling error as random variables and has to treat them as deterministic. To reduce the effect of such deterministic unknowns on the estimation error, one can employ min-max optimization and, in effect, obtain an L2-gain filter. First, the maximization step is executed by computing the worst-case estimation error over the set deterministic signals that captures the modeling mismatches. Second, the minimization step involves the computation of design parameters of the best filter that results in the least worst-case estimation error. The advantage of min-max approach compared with, for example, the Kalman filter is that an unknown signal representing modeling error can be anything as long as its energy is finite or, equivalently, its L2-norm is bounded.