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ROBUST DECONVOLUTION OF NOISY SIGNALS (WedAmOR4)

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Abstract :   We treat the problem of designing a robust estimation filter to recover a stationary random signal $x[n]$ convolved with a linear time–invariant (LTI) filter $h[n]$ and corrupted by additive stationary noise, in the presence of spectra uncertainties. Our approach is based on minimizing the worst–case difference between the MSE in the presence of uncertainties, and the MSE of the Wiener filter that knows the correct power spectra. The resulting filter, referred to as the minimax regret filter, takes the entire uncertainty interval into account, as well as the frequency response of the filter $h[n]$. We demonstrate through an example that the minimax regret filter can often lead to improved performance over traditional minimax MSE approaches for this problem.

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