Intelligent Systems, Robotics and Control (ISRC)

Students taking the MS Written Comprehensive Exam with an ISRC concentration will be evaluated with a problem based on 275A (Parameter Estimation I). The required materials are the class notes and assigned books:


The materials to be covered are:

1. Minimum Variance Unbiased Estimation:
   a) Minimum Variance Criterion
   b) Existence of the MVUE
   c) Vector Parameters

2. Cramer-Rao Lower Bound
   a) CRLB in Gaussian White Noise
   b) Transformation of Parameters
   c) Asymptotic CRLB for WSS Gaussian Processes

3. General MVUE
   a) Sufficient Statistics
   b) Neyman-Fisher Factorization
   c) Sufficient Statistics and the MVUE

4. Best Linear Unbiased Estimates
   a) Linear Models
   b) Finding the BLUE

4. Maximum Likelihood Estimation
   a) Properties of the MLE
   b) Extension to a vector parameter
   c) Asymptotic MLE

4. Least Squares Estimation
   a) Linear LSE
   b) Geometric Interpretation
   c) Sequential LSE
   d) Constrained LSE

Further questions should be addressed to Prof. D.D. Sworder (dsworder@ucsd.edu)