ECE 2372 - Midterm Exam Logistics

In-class: Thursday, March 21, 5:20 P.M (EST)
Duration: 2.5 hours

Rules and Logistics:

1. This midterm exam is going to in class and open notes.
2. Topics that is going to be covered in the midterm exam:
    - Basic Probability
        - binomial distribution
        - union bound
        - Hoeffding's inequality
    - The Bayes classifier
        - how to calculate the classifier
        - how to calculate risk
    - Linear classifiers
        - difference between LDA, logistic regression
        - PLA, maximum margin hyperplanes
    - VC dimension
        - definition
        - how to calculate the VC dimension for a simple example
        - how to "guess" the VC dimension for complicated examples
        - implications of VC generalization bound
    - Bias-variance decomposition
        - how to calculate the "average hypothesis"
        - how to calculate the bias, variance, and total risk
    - Regularization
        - why?
        - understand the practical implications of regularization in both regression and classification
    - Kernels
        - definition of a kernel, how to interpret a kernel as an inner product
        - how to use kernels to do nonlinear regression/classification
    - SVMs
        - understand the derivation

  - equivalence and difference between primal/dual formulations
  - interpretation of support vectors and resulting classifier
- Error estimation
  - understand the appropriate use of a validation set – cross-validation
  - difference between validation and testing

3. Your exam paper will have an integrated answer sheet where you can write down your answers right below the associated question. Please write your answers directly on the exam sheet.

4. All material covered in Lectures 1-9 and Homework Assignments 1-5 may appear on the exam.