Machine Learning & Control Depth in ECE
Overall Systems View

- If you pick CSD, you should take courses in one or more application domains.
- If you pick another depth, you should take some HW/SW design courses in CSD.
Machine Learning

The COOLEST TOPIC IN SCIENCE

- “A breakthrough in machine learning would be worth ten Microsofts” (Bill Gates, Chairman, Microsoft)
- “Machine learning is the next Internet” (Tony Tether, Director, DARPA)
- Machine learning is the hot new thing” (John Hennessy, President, Stanford)
- “Web rankings today are mostly a matter of machine learning” (Prabhakar Raghavan, Dir. Research, Yahoo)
- “Machine learning is going to result in a real revolution” (Greg Papadopoulos, CTO, Sun)
- “Machine learning is today’s discontinuity” (Jerry Yang, CEO, Yahoo)
Machine Learning

- Image Classification
- Document Classification
- Speech Recognition
- Protein Classification
- Fraud Detection
- Computational Advertising

Supervised Learning
Beyond Classification and Supervised Learning

- Regression and Prediction
- Structure Learning (unlabeled data)
- Semi-supervised Learning
- Active Learning (medical image classification)
- Collaborative Filtering (Recommenders)
- Reinforcement Learning
Course Requirements (seventy-two units)

- Breadth Courses: ECE 100, **101**, 107, **109**
- Design Course: one of ECE 111, 115, 140B, 190, or 191
- ML: ECE 175A
- Choice: one of ECE 175B, **171B**, or 172A
- Control: ECE 171A
- Optimization: ECE 174
- Technical Electives: 7 upper-division engineering, math, or physics courses
- Professional Electives: two upper-division courses
- Design Course: one of ECE 111, 115, 140B, 190, or 191