Machine Learning & Control Depth in ECE
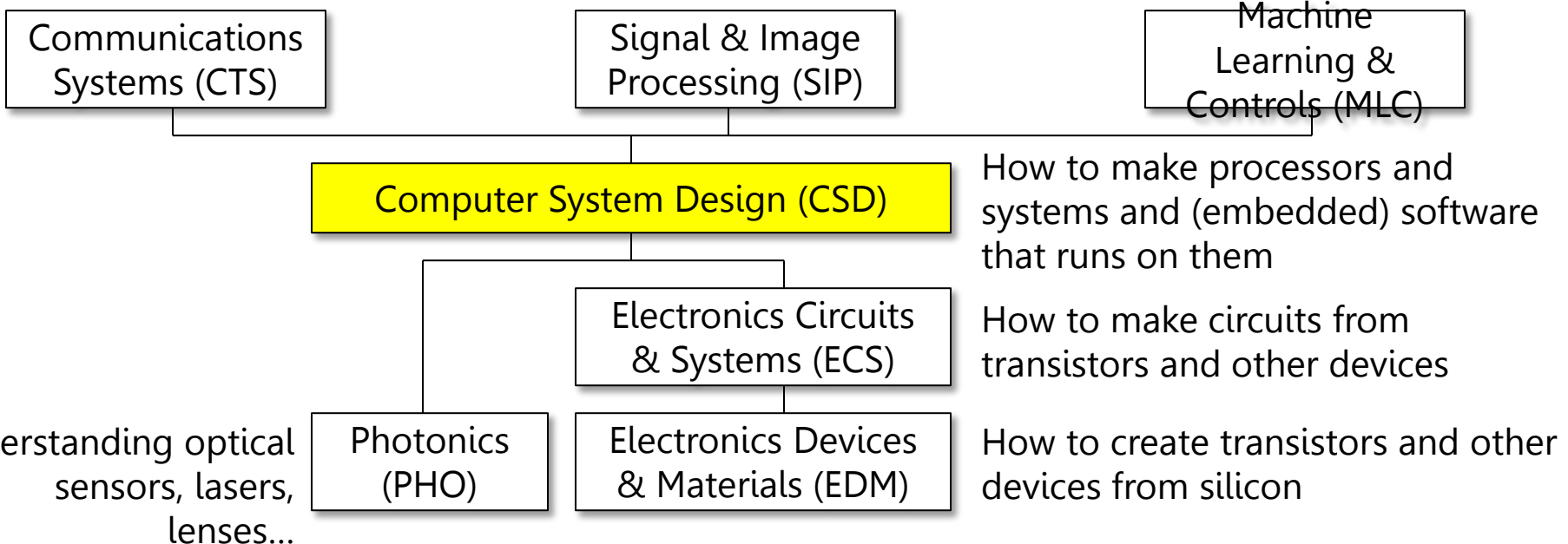
Overall Systems View
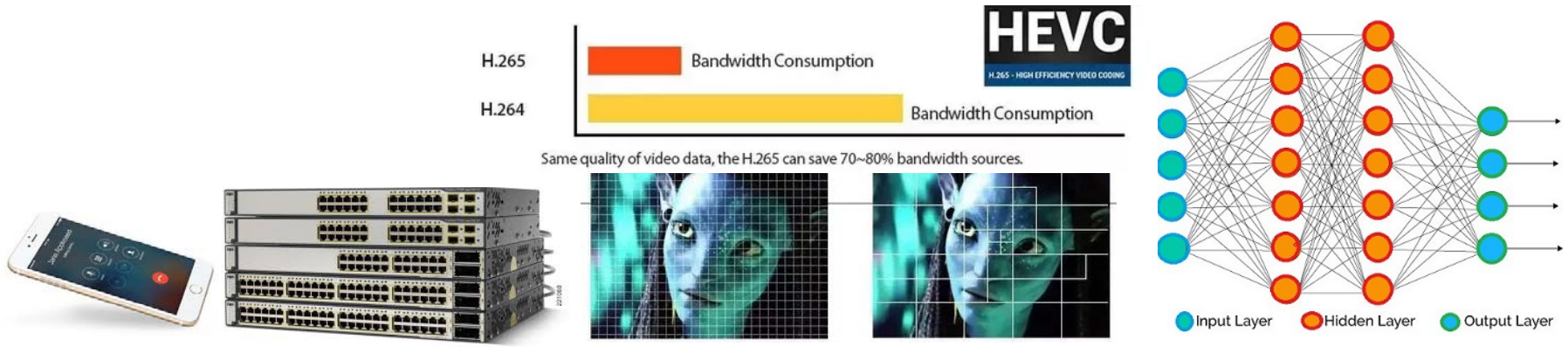
Deeper Understanding of Application Domains

| Communications Systems (CTS) | Signal & Image Processing (SIP) | Machine Learning & Controls (MLC) |

Computer System Design (CSD) — How to make processors and systems and (embedded) software that runs on them

Electronics Circuits & Systems (ECS) — How to make circuits from transistors and other devices

Understanding optical sensors, lasers, lenses...

Photonics (PHO)

Electronics Devices & Materials (EDM) — How to create transistors and other devices from silicon

- 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
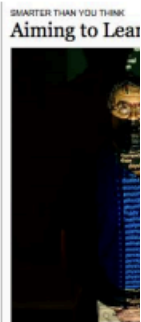
Machine Learning

## 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 Recog

- Protein C

- Fraud De
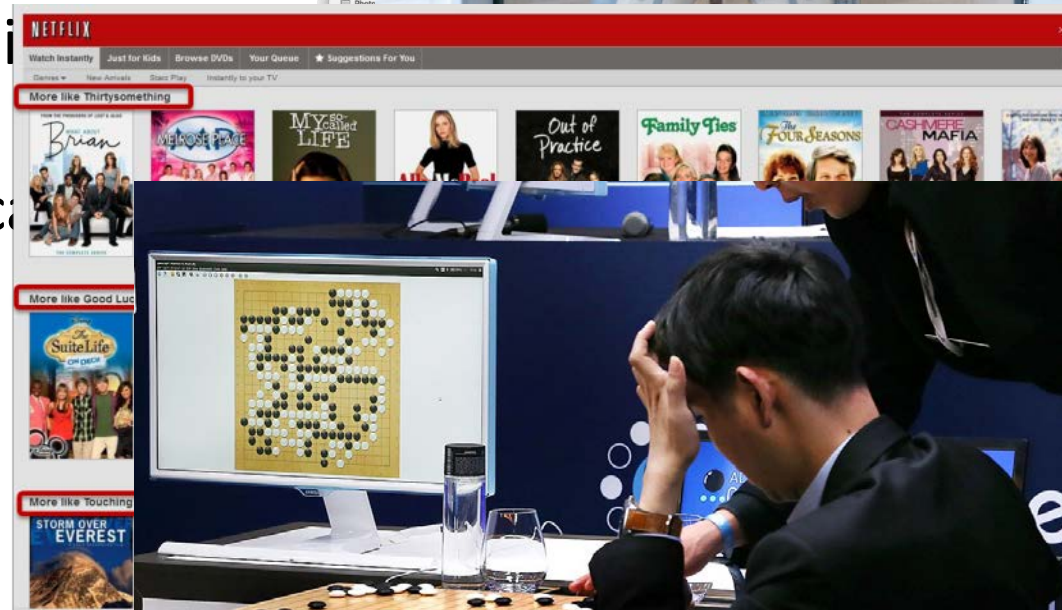
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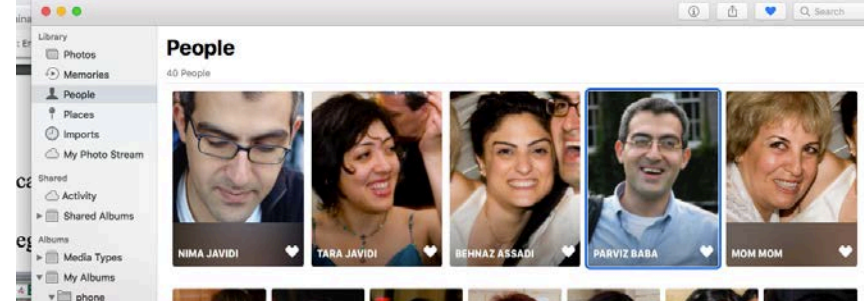
Supervised Learning

n-spam mail
your inbox

ail to a
g area

Beyond Classification and Supervised Learning

- Regression and Prediction

- Structure Learning (unlabeled data)

- Semi-supervised Learni

- Active Learning (medica 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
  - Control: ECE 171A

  - Optimization: ECE 174

- Choice: one of ECE 175B , 171B, or 172A

- 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