Instructors and Contact

- Scott Sanner (EECS)
  - Semi-official TA: Zahra Iman
- Office hours:
  - Immediately following class
- Questions:
  - Use Canvas Discussion Board link from course page
  - Questions to Scott (that cannot be posted to Canvas)
    - Strongly preferred after class
    - If necessary, send short email to scott.sanner@oregonstate.edu

Course Structure

- Representation:
  - Directed & Undirected Graphical Models
  - Factor Graphs
- Inference:
  - Message Passing
  - (MC)MC Sampling
- Learning
  - Parameter Learning
  - Structure Learning
  - Bayesian Inference Perspective
- Practical use and applications (what works where)
  - With Java implementation!
- Overview of state-of-the-art research topics

Learning Objectives

- Understand the motivations and probabilistic foundations for PGMs.
- Understand the importance of structured factor representations including trees and decision diagrams.
- Understand the semantics of directed and undirected PGMs and their unified representation as factor graphs.
- Understand message passing algorithms for PGMs and their computational and inferential characteristics.
- Understand (Markov Chain) Monte Carlo methods of inference in PGMs and their computational and inferential characteristics.
- Understand maximum (conditional) likelihood learning for both directed and undirected PGMs.
- Understand the use of PGMs for Bayesian learning and inference.
- Understand effective learning and inference algorithms for PGMs in applied settings.

Topics Not Covered

- Deep theory of join trees and I-maps
- Deep theory of structure learning
- Bayesian non-parametrics (NPs)
  - Dirichlet processes
  - Hierarchical NP processes
- Focus is on topics you might use as a practitioner or researcher

Assessment

- Assessment: (total: 100 points)
- 40 points: 4 assignments (10 points each)
  - 20% deducted per day late (or fraction thereof), e.g.,
    - 1 minute late = 20% deduction
    - 1 day late = 20% deduction
    - 1 day 1 minute late = 40% deduction
    - 5 days late = 100% deduction = 0 points
- 15 points: independent mini-project
- 15 points: midterm
- 30 points: final exam

See course web page for up-to-date schedule: http://classes.engr.oregonstate.edu/eecs/winter2016/cs536/
Collaboration Policy

• Please learn from your fellow students and online web materials but

(a) the code and written work you hand in must be your own (plagiarism will result in immediate failure of the course), and

(b) you should list all people you talked to and all web resources you used at the beginning of your assignment.

Tentative Schedule

• MWF 1300-1350, STAG 260
• Tentative schedule at right (web page is definitive version)
• Note the mid-term and final exams
• Need to discuss assignment grading
• Submit assignments on Canvas
• Grades available on Canvas

Book


All Course Content

• Everything posted on web page or Canvas Discussion forum… nowhere else.

• Use the Canvas Forum
  – I will ask you to post your question to Canvas before it is answered
  – Others can answer your question
  – Others will have the same question