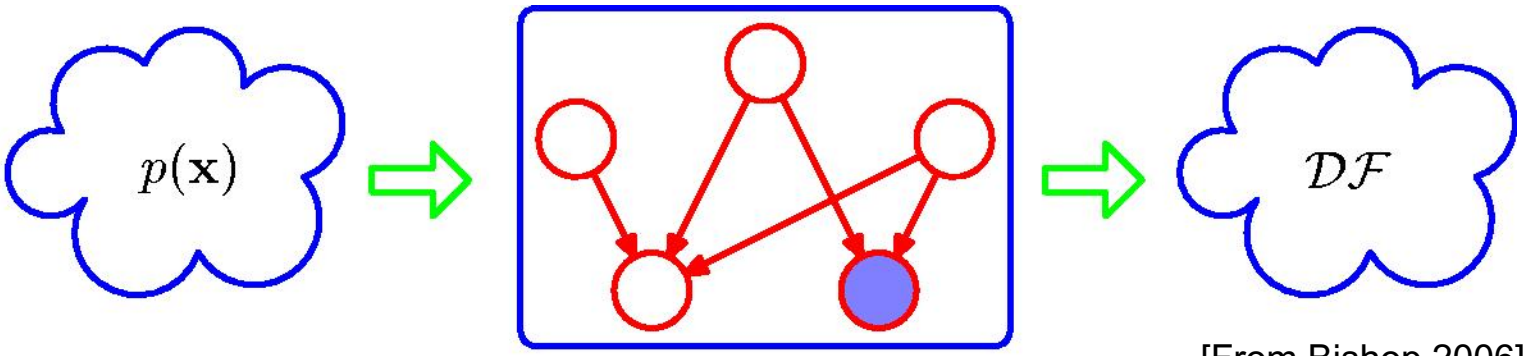
ECE 175B
Probabilistic Reasoning & Graphical Models



[From Bishop 2006]

Ken Kreutz-Delgado

ECE Department - UC San Diego

Spring Quarter 2018

Contact Information

- **Course Website (Use initially - Afterwards use Piazza!)**
  - Accessible from **http://dsp.ucsd.edu/~kreutz**
- **Instructor**
  - Ken Kreutz-Delgado
    kreutz@ece.ucsd.edu
    Office Hour: Monday, 3-4pm, EBU-I 5605
- **TA & Piazza Moderator**
  - Luca Pion-Tonachini, lpionton@ucsd.edu
- **Faculty Assististant (FA)**
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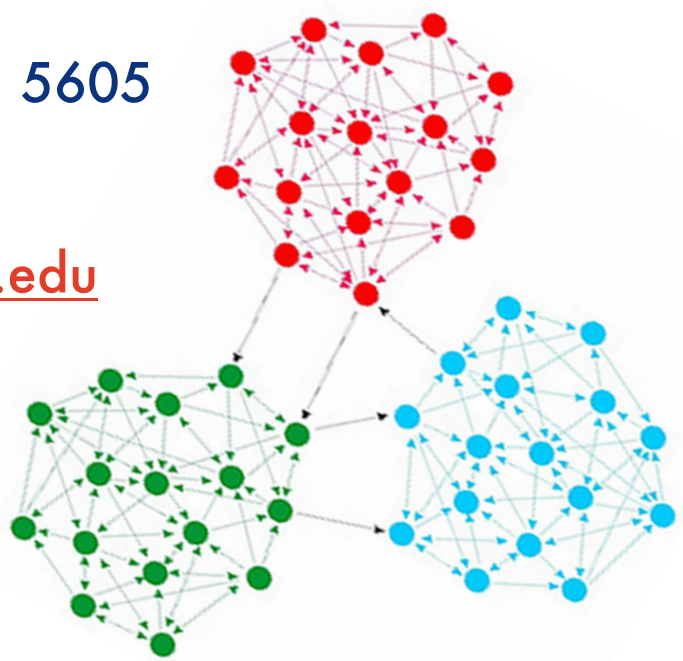

Course Reading Packet
(available from bookstore)

Excerpted chapters from:

- ***Bayesian Reasoning & Machine Learning***
  David Barber, Cambridge U. Press, 2012
- ***Machine Learning: A Probabilistic Perspective***
  Kevin Murphy, MIT Press, 2012
- ***Probabilistic Graphical Models***
  Daphne Koller & Nir Friedman, MIT Press, 2009
- Supplemental Texts
  - *Pattern Recognition & Machine Learning,* C.M. Bishop, Springer, 2007. Especially Chapter 8
  - *Artificial Intelligence: A Modern Approach 2e,* S. Russell & P. Norvig, Prentice-Hall, 2003

Course Objectives

- **Bayesian Probability theory:** A "inference calculus" for reasoning and decision making in uncertain situations and environments.

- **+ Graphs:** Encode & structure relationships and interdependencies.

- **= Probabilistic Graphical Models (PGMs):** Graphs encode *probabilistic* relationships & dependencies.
  - The use of Graphical Models, conditional independence and D-Separation for complexity management and knowledge encoding.

- **Inference in PGMs:** Efficient Bayesian decision making

Assumed Course Background

- **It is assumed that students know the material from Linear Algebra and Probability well.**
  - If you have taken ECE 109, ECE 174 and ECE 175A you should be well prepared for this course.
- **It is assumed that students know the material from a basic course in pattern recognition well.**
  - If you have taken ECE 175A you should be well prepared for this course.
- **Students should know Matlab, or some other script-based programming language (Python, Maple, Mathematica …)**
  - Again, ECE 174 and ECE 175A should be adequate preparation.

Course Performance Evaluation

- **30% Homework (can include computer assignments); 30% Midterm Exam; 40% Final Exam.**

  This breakdown is firm and non-negotiable.

  - **Homework (30%)** is graded "A for *Actual* **Effort**". You get full credit for turning assignments in **on time**, **and** if it is evident that you worked on ***all*** of the problems **in good faith**. You get partial (or zero) credit if you are missing problems or it is clear that no real good faith effort was expended in attempting to solve the problems and programming assignments. You get ***zero credit*** if you turn in nothing. Note that *the assignments are* ***not*** *corrected*.
  - **The Midterm (30%)** and **Final (40%)** are ***rigorously graded*** for correctness of derivations and results.

- The Final Exam is scheduled for **Friday, June 15, 2018, 7-10pm**. ***The Final date and time is firm & non-negotiable***.

Student Collaboration & Cheating

- Students are allowed to ***discuss*** homework assignments.
  - ***Individual homework must be turned in on time.***
  - Not understanding homework solutions will hurt you on the midterm and final exams, which together comprise 70% of the overall course grade.
- Exams are ***closed notes and closed book***.
- ***Aggressive administrative action will be taken against students caught cheating***.
  - Students caught cheating will be ***immediately reported*** to the UCSD Academic Integrity Office.