

DD2420 - PGM Course Info

- 8 Lectures + 3 or more Tutorials + Exam
- Course Book: Probabilistic Graphical Models – Principles and Techniques, Koller and Friedman.
 - Book is an excellent reference giving a complete picture.
 - Reading is required before each lecture.
 - What I say in class is important to focus your attention while re-reading the book.

Lectures

- I will give a different perspective on the subjects from the book.
- I will discuss some topics from the tutorials but not in a complete way.
- I will base the exam on what I cover in the lectures.

Exam (TEN1)

- It is Pass/Fail and pass required to pass the course.
- It will cover the main topics of the course and be divided into sections with minimum passing points for each section.

Required Tutorials (PRO1 & 2)

- PRO1 (2 points.):
 - Tutorial 1, Message Passing (No coding, uploaded only);
 - Tutorial 2, Bayes Nets, Python using pgmpy.
- PRO2 (1 point):
 - Tutorial 3 Conditional Random Fields, Matlab, Grabcut image segmentation.

Optional Tutorials (Higher Grades)

- Chose 0 to 4 additional tutorials to earn more points.
- Grade given by the total points earned.
 - E: 3-11 points
 - D: 12-23 points
 - C: 24-36 points
 - B: 37-51 points
 - A: 52+ points
- Notice that some of the tutorials can earn partial scores (i.e. less than the max points). So one should not count on getting full points.

Tutorials

- Upload the first in CANVAS, then book an oral examination time slot, the day before the examination.
- You may book one slot at a time and there are 6 weeks.
- Each week there are two days with time slots but a particular tutorial will (most often) only have slots on one of those two days.
- You must prepare to present what you learned in the tutorial as opposed to just showing your answers. It is up to you to demonstrate your understanding.
- If you do not do that you can re-examine on another week, but that will block you from signing up for other tutorial time slots.
- Thus one must work very steadily here to pass 6 tutorials orally (+ tutorial 1).
You are assured to have one time slot a week (if you sign up the day before).
- You might be able to sign up for a second after having shown the first on a week, if there are slots left.

Tutorials

- There is a large variety in the tutorials and the points reflect relative difficulty of them.
- The ones for 10 point are quite challenging while many of you will find you are not prepared to do what it takes to pass the 20 point ones.
- There is both theory and hands on programming examples to help you understand.
- “Doing” the tutorials is straightforward but to understand takes extra time. You should search for reading on concepts you do not understand from the explanations.
- Some of the topics go far beyond what we cover in lectures.
- It is great to both read and add to the CANVAS discussions on the tutorials.
- The tutorials should be done in ascending order.

Plagiarism

- The tutorials should be done individually.
- You are encouraged to help one another to understand what to do, the concepts in the tutorial, issues with the programming and so on.
- You should not exchange code or answers.
- In the end you must understand to be able to convince in your presentation.
- If you use information from a source (for example a paper or web page) cite it.
- Failure to cite a source will result in failure.

Basic Probability (Chap 2)

- Do you know:
 - “A discrete random variable, X ,” means?
 - “A probability density function, pdf, $p(x)$ ” is ?
 - Conditional Probability $P(X|Y)$?
- Can you compute an expectation value $E(X)$?
 - Moments?
 - A variance? $E(X^2) - E(X)^2$
 - A covariance?
- What is independence $X \perp Y$?
- Conditional Independence $X \perp Y \mid Z$?

Basics

- Marginalize out y from the 'joint' $p(x,y)$
 - $p(x) = \int p(x,y)dy$
- $P(X, Y) = P(X | Y)P(Y) = P(Y | X)P(X)$
- $P(X | Y) = P(X, Y) / P(Y)$
- Bayes Theorem:
 - $P(X|Y) = P(Y|X)P(X) / P(Y)$

Are you Able to think Right?

- Sore throat is a symptom of both throat cancer and a cold.
- The chance of having a sore throat with a cancer is 99%.
- The chance with a cold is 30%
- You get a sore throat. What is the most likely cause?