

37457

Advanced Bayesian Methods

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University of Technology Sydney

Main Topics

- Topic 1 Probabilistic Graph Theory
- Topic 2 Bayesian Statistical Inference
- Topic 3 Bayesian Inference Engines
- Topic 4 Advanced Bayesian Statistical
Models and Analyses

Agenda for Today's Class

FIRSTLY: WRAP UP...

- Topic 1 Probabilistic Graph Theory

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- Topic 1 Probabilistic Graph Theory

SECONDLY: START ON...

- Topic 2 Bayesian Statistical Inference

Major Goal for this Subject

By Week 6, tool you up to be able to do

ANY*

data analysis, no matter how complex,

– and UNDERSTAND THE UNDERLYING MATHS.

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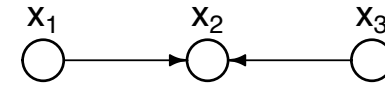
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CENTRAL CONCEPT: DETERMINATION OF FULL CONDITIONAL DISTRIBUTIONS → OUR NEXT FOCUS!



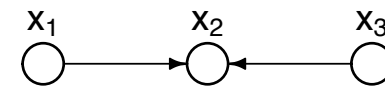
$$x_1 \sim N(3, \frac{1}{4}), \quad x_3 \sim \text{Gamma}(6, 1).$$

$$x_2 | x_1, x_3 \sim N(47 - 11x_1, 1/(2x_3))$$

(WHICH IS ONE OF THE FULL CONDITIONALS)

WANTED: THE OTHER TWO FULL CONDITIONALS

1. $p(x_1 | x_2, x_3)$
2. $p(x_3 | x_1, x_2)$



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WHY ARE THESE WANTED?

ANSWER: They will help us approximate $p(x_2)$.
(i.e. solve, practically, the marginalisation problem.)

END OF TOPIC 1

HOUSE- KEEPING

This Subject's Four Topics

Topic 1 Probabilistic Graph Theory **JUST FINISHED**

Topic 2 Bayesian Statistical Inference **NEXT UP!**

Topic 3 Bayesian Inference Engines

Topic 4 Advanced Bayesian Statistical

Models and Analyses

***ASSIGNMENT 3
IS NOW
RELEASED***

Class 5 Location

Recall that during Weeks 1 – 6 we have

ROOM CHANGES EVERY WEEK!

Class 5 is in

Room 330, Level 2, Building 10

(cross Jones Street;
enter Building 10 and

stay on street level (Level 2).

Room 330 is just past Student Services.)

Laboratory 2: Laptop Preparation

Laboratory 2 is part of Class 6
(2 weeks from now).

Instructions for getting your laptop ready for
Laboratory 2 are on the subject web-site.

Updated (Corrected) Pages to the Notes

Thanks to Andrei and Sagar for alerting me to
some (localised) errors in the notes.

The following sheets of paper are affected:

- pages 2 and 3,
- pages 18 and 19,
- pages 50 and 51.

Please replace updated versions (to be handed
out now) in your version of the notes.

“30% of Subject” → **Feedback**

How is the subject going at the 30% mark?

How might it be improved for the remaining 70%?

Please take 2–3 minutes to fill out a 1-page
feedback form.

Emory will collect the filled out forms.