

Bayesian Network Study Group

Organisation & Schedule

Organisation

All meetings will be conducted via zoom: <https://aarhusuniversity.zoom.us/j/5068577310>

Schedule

1. Bayes & Graph Theory (Tuesday 13/09/2022; 15:00 – 17:00 CEST)

- Bayesian Statistics & Frameworks
 - Probabilistics
 - Probability
 - Joint probability
 - Conditional probability
 - Marginal probability
 - Sources:
 - [Scutari \(p. 177-186\)](#)
 - Conditional independence
 - Bayes Theorem
 - Uncertainty
 - Belief Updating
 - Directed Acyclic Graphs
 - Sources:
 - Bayesian Modelling:
http://videlectures.net/mlss2012_ghahramani_bayesian_modelling/
- Graph Theory & Bayesian Networks in Theory
 - Graph Theory
 - Graphs
 - Nodes
 - Arcs
 - Conditional Independence
 - Graphical Separation
 - Sources:
 - [Nagarajan et al. \(p. 1-4; 34\)](#)
 - [Scutari \(p. 85-86; 173-177; 187\)](#)
 - Bayesian Networks
 - Markov Blankets
 - Moral Graphs
 - Sources:
 - [Nagarajan et al. \(p. 85-89\)](#)
 - [Scutari \(p. 87-95\)](#)
 - Sources:
 - Graphical Models & Bayes:
http://videlectures.net/mlss09uk_ghahramani_gm/

2. (Bayesian) Networks in Practice (Tuesday 27/09/2022; 15:00 – 17:00 CEST)

- Software Considerations
 - i. R Packages
 - ii. BUGS / JAGS
 - iii. STAN
- Creating networks in R
 - i. Adding nodes & variables
 - ii. Nodes from data
 - iii. Adding links
- Network Visualisation
 - i. ggdag, qplot, igraph
- Sources:
 - *Nagarajan et al.* (p. 24-34)
 - *Scutari* (p. 125-137)
 - Stanford Lecture Series:
 - https://www.youtube.com/watch?v=U23yuPEACG0&list=PLoROMvodv4rO1NB9TD4iUZ3qghGEGtqNX&index=14&ab_channel=StanfordOnline
 - https://www.youtube.com/watch?v=Gpoj3zfX60g&list=PLoROMvodv4rO1NB9TD4iUZ3qghGEGtqNX&index=15&ab_channel=StanfordOnline
 - https://www.youtube.com/watch?v=Fa-rr6AXMwg&list=PLoROMvodv4rO1NB9TD4iUZ3qghGEGtqNX&index=16&ab_channel=StanfordOnline

3. Multinomial Bayesian Networks (Tuesday 04/10/2022; 15:00 – 17:00 CEST)

- [Scutari CH1](#)

4. Gaussian Bayesian Networks (Tuesday 11/10/2022; 15:00 – 17:00 CEST)

- [Scutari CH2](#)

5. Hybrid Bayesian Networks (Tuesday 18/10/2022; 15:00 – 17:00 CEST)

- [Scutari CH3](#)

6. Static Bayesian Networks (Tuesday 25/10/2022; 15:00 – 17:00 CEST)

- [Nagarajan CH2](#)

7. Dynamic Bayesian Networks (Tuesday 01/11/2022; 15:00 – 17:00 CEST)

- [Nagarajan CH3](#)

8. Bayesian Network Inference (Tuesday 08/11/2022; 15:00 – 17:00 CEST)

- [Scutari CH4](#)
- [Nagarajan CH4](#)

9. Real-World Applications & Parallel Computation (Tuesday 22/11/2022; 15:00 – 17:00 CEST)

- [Scutari CH6](#)
- [Nagarajan CH5](#)
- Explanation Trees through Causal Bayesian networks:
http://videlectures.net/uai08_pellet_et/