Graphical Models
Discrete Inference and Learning

MVA
2019 – 2020

http://thoth.inrialpes.fr/~alahari/disinflearn
Lecturers

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Organization

• 8 lectures of 3 hours each

• Tuesdays at CentraleSupelec (except 12/3)

• 13:45 – 17:00 with a short break or two

• Last lecture: 12\textsuperscript{th} March

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Requirements

• Solid understanding of mathematical models
  – Linear algebra
  – Integral transforms
  – Differential equations

• Ideally, a basic course in discrete optimization
Topics covered

• Basic concepts, Bayesian networks, Markov random fields
• Dynamic programming, reparameterization, message-passing methods, belief propagation (e.g., sum-product, generalized)
• Graph-cuts: binary and multi-label energy minimization
• Move-making algorithms, Tree-reweighted message passing
• Convex relaxations, linear programming relaxations
• Primal-dual schema, dual decomposition
• Parameter learning
• Recent advances
Evaluation

• Projects

• In groups of at most 3 people

• Report and presentation on 17/3

• Topics: your own or see list this week

• Bonus points for excellent class participation
What you will learn?

- Fundamental methods
- Real-world applications
- Also, pointers to using these methods in your work
Your tasks

• Following the lectures and participating actively

• Reading the literature

• Doing well in the project

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