Graphical Models
Discrete Inference and Learning

MVA
2020 – 2021

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

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Organization

• 7 lectures of 3 hours each
  – Today + 11/1, 12/1, 19/1, 22/1, 26/1, 2/2

• 13:45 – 17:00 with a short break or two
  – Except 11/1 (09:00 – 12:10)

• Last lecture: 2\textsuperscript{nd} February

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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 31/3

• 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