

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: 2nd 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