Graphical Models
Discrete Inference and Learning

MVA

2021 – 2022

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

Lecturers

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Organization

- 7 lectures of 3 hours each
  - Today + 18/1, 25/1, 1/2, 22/2, 1/3, 8/3
- 13:45 – 17:00 with a short break or two
- Last lecture: 8th 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
- Deep learning in graphical models, Other recent advances

Evaluation

- Projects
- In groups of at most 3 people
- Report and presentation on 1/4
- Topics: your own or see list on 25/1
- 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