

# 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 CentraleSupélec (except 12/3)
- 13:45 – 17:00 with a short break or two
- Last lecture: 12<sup>th</sup> 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
- **Now:** Send email to [sympa@inria.fr](mailto:sympa@inria.fr)
  - Subject – subscribe grmdil

# Internship possibilities

- Talk to me!