

# Vision, Optimization and Learning

February 12-13, 2020, École polytechnique

Thomas POCK (*Graz University of Technology*)



## PGMO and M2 Optimisation

<https://www.fondation-hadamard.fr/PGMO>

<https://webens.math.u-psud.fr/-optimization>

**Lecture 1** - Wednesday, Feb 12, 10h00-12h45, Amphi Cauchy

**Lecture 2** - Wednesday, Feb 12, 14h15-17h00, Amphi Cauchy

**Lecture 3** - Thursday, Feb 13, 10h00-12h45, Amphi Becquerel

**Lecture 4** - Thursday, Feb 13, 14h15-17h00, Amphi Becquerel

*I will talk about (non-) convex and non-smooth optimization methods with applications to variational problems in computer vision. The course addresses accelerated gradient descent methods and their generalization to non-convex optimization problems, primal dual methods, and hybrid algorithms that combine continuous optimization with dynamic programming. I will show how to solve practical problems that occur in computer vision, such as image restoration, stereo, optical flow, and medical image reconstruction. In addition to more theoretical considerations, this lecture will also show how some of the algorithms can be practically implemented in Python (using Jupyter notebooks). Participants are therefore invited to bring their laptop with a running version of Python to participate in the practical tasks. Finally, will also show how to use machine learning techniques to learn better models from data.*

This lecture series is jointly organized by Ecole Polytechnique, INRIA, Master d'Optimisation de Paris Saclay and Fondation Mathématique Jacques Hadamard, in partnership with IRS ICODE, in the framework of the Gaspard Monge Optimization Programme supported by EDF.

Lectures are open to researchers and graduate students.

Registration (free of charge) on <https://indico.math.cnrs.fr/event/5381/>

### Organizers:

P. Carpentier (ENSTA)

A. Chambolle (École polytechnique, CNRS)

S. Charousset (EDF)

S. Gaubert (INRIA and Ecole polytechnique)

Q. Mérigot (Université Paris Sud)

J.-C. Pesquet (CentraleSupélec)

