Convex optimization

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What this class is about

Goals of the class:

- taxonomy of ML optimization problems
- variety of algorithms to solve them
- pillars of optimisation
- regularisation and sparsity

Organization

6 lectures of 45 minutes:

1. Intuition: GD on OLS
2. General framework
3. Non-smooth optimization
4. Duality theory
5. Sparsity
6. Implicit reguliarization/bias

Additional exercises on my website (`https://mathurinm.github.io`)

Numerical illustrations in Python notebooks on my website

Resources

Books (PDFs available online):

- *First order methods in optimization*, A. Beck, 2017
- *Convex optimization, algorithms and complexity*, S. Bubeck, 2015
- *(Introductory) Lectures on convex optimization*, Y. Nesterov, 2003/2018

Code:

- Scipy lecture notes: https://scipy-lectures.org/

Don't hesitate to aks for more!