Convex Optimization Short Course

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Materials for a short course given in various places:

- *Machine Learning Summer School*, Tubingen and Kyoto, 2015

- *North American School of Information Theory*, UCSD, 2015

- CUHK-SZ, Shenzhen, 2016

- SIST, Shanghai, 2016

- IMT, Lucca, 2016

- Seoul National University, 2018

- Beijing Jiatong University, 2019

Lecture slides, IPython notebooks, and videos

- Convex optimization short course

- Introduction to Python

  - Companion Jupyter notebook files

- Convex optimization overview

  - Total variation image in-painting

  - Control

  - SVM classifier with ℓ_1 regularization

- Constructive convex analysis and disciplined convex programming

  - DCP analysis

  - Trade-off curves

- Convex optimization applications

  - Portfolio optimization

  - Worst-case risk analysis

  - Optimal advertising

  - Huber regression

- - Quantile regression

  - Model fitting

- Videos (MLSS, Tubingen)

  - Part I

  - Part II

  - Part III

- Exercises

Additional materials

- *Convex Optimization* (book)

- Additional exercises

- EE364a (course)

- CVX101 (MOOC)

- *dcp.stanford.edu*

Software

- CVX

- CVXPY

- Convex.jl

- CVXR

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