

Convex Optimization Short Course

Stephen Boyd Steven Diamond
Akshay Agrawal Junzi Zhang

EE & CS Departments
Stanford University

About the course

- ▶ materials
 - ▶ three lectures
 - ▶ corresponding code (iPython notebooks)

online at

`stanford.edu/~boyd/papers/cvx_short_course`

- ▶ course goal:
bring you up to speed on basic (applied) convex optimization
- ▶ our focus:
 - ▶ problem formulation
 - ▶ applications
 - ▶ coding

About the course

- ▶ we *won't* cover
 - ▶ theory
 - ▶ duality & optimality conditions
 - ▶ solution algorithms
 - ▶ convex relaxations(you can learn these things later)

- ▶ you need to know some basic
 - ▶ linear algebra, probability, and computer science
 - ▶ Python, Matlab, or Julia

Outline

1. Convex Optimization Overview
 - ▶ read chapter 1 of *Convex Optimization*
 - ▶ install CVX, CVXPY, Convex.jl, or CVXR, try 'hello world'
2. Constructive Convex Analysis and Disciplined Convex Programming (DCP)
 - ▶ try out `dcp.stanford.edu`
 - ▶ explore DCP in your chosen language
3. Convex Optimization Applications
 - ▶ explore / modify application codes
 - ▶ try your own problems . . .

Ready for more?

- ▶ *Convex Optimization* (book)
- ▶ *EE364a/b* (course slides, videos, code, homework, ...)
- ▶ software CVX, CVXPY, Convex.jl, CVXR

all available online

... and many other books and papers on convex analysis, convex optimization, and applications