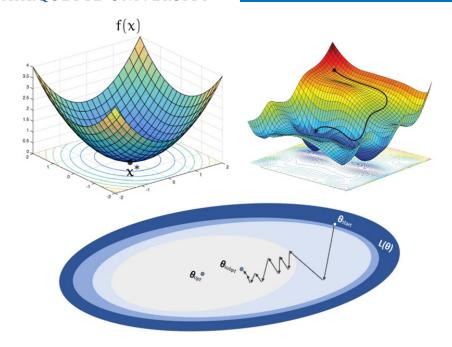


ELEN 4550/EECE 5550 FALL 2021 Developments in Signal Processing: Optimization for Engineers T'Th 9:30 - 10:45



- Optimization theory and methods are a foundation to many areas in modern science and engineering, e.g., machine learning.
- Optimization is about achieving the "best result" given an objective and a set of constraints. Optimization problems can be found in communications, signal processing, power, transportation, and many other areas.
- In this course, we will learn the theory and methods of convex optimization, including the basic concepts, optimization problems, optimization algorithms, and applications. In the course project, you may either find an optimization problem or choose an application and formulate a problem, and use an optimization tool (CVX) to solve the problem in MATLAB.
- Prerequisites:
 Linear Algebra, Introduction-level Algorithms, Probability
- Textbook: "Convex Optimization", Cambridge University Press, 2004

COURSE CONTENT

- Convex Sets
- Convex Functions
- Linear Programming
- Quadratic Programming
- Semidefinite Programming
- Optimality Conditions
- Duality Theory
- Unconstrained Optimization
- Interior-Point Methods
- Engineering Applications

PROJECT INFORMATION

- Project Steps:
 - ▲ Study an optimization method or algorithm
 - Simulate and solve a problem using optimization tools
- Project Delivery
 - **▲** Presentation
 - ▲ Short report
- Project Topics
 - ▲ From the textbook
 - ▲ From a research work
 - ▲ Propose your own topic