

EE578B - Convex Optimization - Winter 2021

Project Guidelines

Due Date: Last day of finals week, Friday, Mar 19th, 2021 @ 7:00 PM

Summary

The goal of the project is to apply the convex modeling techniques learned in class to a new system/problem of your choice. **Select an application of interest that can be solved using convex optimization.** There are many different applications for convex optimization techniques. The following are some links to look at to get started.

- <https://web.stanford.edu/class/ee364a/lectures/examples.pdf>
- <https://ljk.imag.fr/membres/Jerome.Malick/Talks/11-INRIA.pdf>

If you're having trouble picking an application, I am happy to help.

Project Components

Your deliverable for the product is a **single report** with the following components

- **Introduction:**
Explain the application and problem motivation and cite and needed references
- **Problem Setup:**
Present the modeling formulation including notation, justification of modeling choices, objective function to optimize and constraints. The problem you choose should illustrate the techniques discussed in class (convex duality, equality and inequality constraints, conjugate functions).
- **Optimization Problems:**
Write the primal and dual optimization problems (including derivations for any non-standard calculations) and give an intuitive meaning of the variables, objectives, and constraints of each.
- **Applications:**
Solve both the primal and dual optimization problems given above for some interesting problem instance. This can involve either real world data (if you can get it) or an interesting simulation involving an artificial problem instance. You should plan to use `cvx` or `cvxpy` but you may also use your own algorithm implementation or another solver package.
- **Discussion:**
Discuss your results and give suggests for how the problem could be expanded in future.

- **Code:**

Include a pdf printout of the code used to produce your results.

- **References:**

List any needed references.