Convex Optimization and Trajectory Generation for Agile Quad-Rotor Maneuvering and Obstacle Avoidance: Use the techniques reviewed in the convex optimization lectures to reproduce the results in this paper [1] for the case with two obstacles. The report will be graded with respect to the following aspects:

- Correctness (30%): Statements, equations, simulations, etc.
- Clarity (30%): The report should enable the reader to understand your problem, your approach, and your results. The details given should be enough for the reader to reproduce your results. Any figures should be easy to read.
- Completeness (40%): The project should be concluded with a reasonable set of results. Summarize the key steps in formulating the optimization problem. Report the average time it takes for solving ten instances of the problem using both *coneprog* and *CVX*. Include 2D and 3D figures similar to Fig 6 in the paper. **Conclusion/Summary:** Summarize the main challenges you faced in this project and what you learned from this assignment. Report the total number of hours spent on this project.

What to submit: Your report should be typeset in Overleaf, and your final report has to be in a PDF format. In addition, you should upload your code as a zip file with its main files named as 'YourNameQuadConvexConprog.m' and 'YourNameQuadConvexCVX.m'.

References

[1] Michael Szmuk, Carlo Alberto Pascucci, Daniel Dueri, and Behcet Açikmeşe. Convexification and real-time on-board optimization for agile quad-rotor maneuvering and obstacle avoidance. In *2017 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, pages 4862–4868. IEEE, 2017.