
Personal Statement

I have selected two projects. In the probability project I discuss barriers; in the wind tunnel project I discuss leadership. For documentation on these projects, see tmcvoy.com.

Probability

In the fall of 2023, I joined a machine learning research group and quickly realized I needed a stronger foundation in probability. After my proposal for an independent study was rejected, I created my own self-study plan using syllabi from other schools.

Outcomes (Short Term)

Using Sheldon Ross's *A First Course in Probability* as my main text, I worked through every chapter up to and including joint distributions. By the end of my self-study, I produced roughly 100 pages of notes and problem solutions.

Outcomes (Long Term)

I planned to enroll in probability when it was eventually offered regardless of what I studied on my own, just to be sure I mastered the material. You may ask, then, "Why do the self-study at all?" Timing. I anticipated that if I had waited to study probability, my most significant projects (REU and senior thesis) would not have been possible, and I was correct. Without my self-study, the core of my graduate application would cease to exist.

Wind Tunnel

When classes went online during 2020, I convinced a friend of mine, Daniel, to quarantine and move in with me. Over several months, we built a wind tunnel that was roughly 25 feet long with a 6x6 foot inlet leading into a 1x2x3 foot testing chamber.

Motivation

Daniel and I were studying at a community college, and junior colleges do not have a lot of opportunities to explore engineering beyond introductory science courses like Physics. A hands-on project gave Daniel and I experience that we could not find in the classroom (for Daniel, technical experience; for me, experience in mentorship).

My Role

I initiated the wind tunnel project as an effort to catapult Daniel towards his goals. While I did help assemble the wind tunnel and find resources for the design, my main role was simply to support Daniel. I could tell that he was talented but in need of a confidence boost.

Results

We were able to run some experiments and get data, but admittedly, I'm much more proud of what this project did for Daniel's career trajectory. He left the project with a greater sense of drive and is now at the Technical University of Munich studying drones and their potential for rapid emergency-medical response.

Big Picture

The wind tunnel project is my model for the power of collaboration. Prior to the project Daniel had specialized knowledge but lacked organization whereas I had organization but lacked specialized knowledge. Together, we built an approximation of a multi-million dollar machine using only fans and some plywood.

Conclusion

SOMETHING SOMETHING, I plan to continue my resourcefulness and leadership in graduate school...