

The Affordable Smart Wheelchair

The Affordable Smart Wheelchair is a student run engineering project which hopes to build an affordable add-on for existing power wheelchairs which will provide two levels of assistance: automated driving and navigation as well as driving assistance. It will also work with Alexa for voice control. Our project is advised by our principal investigator, Dr. Jack Silberman as well as Dr. Deborah Forster and Dr. Colleen Emmenegger. The project began the spring quarter of 2018 through the ECE SRIP (Summer Research Internship Program) and would later become a UCSD registered student org during the 2018 - 2019 school year.

Our project has presented at multiple UCSD events: SRC (Summer Research Conference), CRI Forum 2018, and other events. As of January 2019, our team's submission to the CHI 2019 Student Research Competition. In our quest to get funding for our members to attend the conference, we applied to the Norman Design Fund from the UC San Diego Design Lab and were awarded \$1500 from the Norman Fund. Through the contribution and requirements of the Norman Design Fund, we were not only able to provide our users with a career building experience, but also able to gather new ideas about the direction about the technical and user research aspects of our project.

Besides allowing us to win third place in the competition, the Norman Design Fund allowed us to experience a global conference and give us a new direction for our project. For many of us, CHI was our conference at such a large scale and we got to attend paper presentations, demos, network, and learn more about the field of HCI. In addition, it helped us understand where we should improve our user research. While we did win third in the competition, we learned that as we move forward, we need to quantify our information. The first place winner had both a finished product and present figures to show trends in his data. Because our project is relatively new, we could only present our prototype and highlight quotes from our user interviews. Moving forward we should take our user interviews and show useful trends that prove our project is useful.

In addition, by presenting at the Design Lab (as required by the Norman Design Fund) and at CHI, we acquired new insights on the technical direction of our project. One of the suggestions from the judges at the conference is that we should explore the idea of voice control and perform more research on what our potential user would find useful from it. In addition, through our presentation at the Design Lab we learned about the idea of pre-built paths and utilizing those to simplify our hardware.