

Annalisa Tostenson

Bachelor's of Science in Mechanical
Engineering
with a Minor in Mathematics
2017 - 2020

[Home](#)

[About Me](#)

[Honors Program](#)

[Contact](#)



Intro & Mission Statement

Welcome to my Honors Portfolio. My name is Annalisa Tostenson. I am an Undergraduate Senior studying Mechanical Engineering with a minor in Mathematics. I will be graduating in the Spring of 2021, and am applying to graduate schools to study robotics.

I will always strive to develop my skills as an engineer and researcher, respect all people, and pursue excellence in all aspects of my life.

[Read More](#)

UPCOMING EVENTS

Annalisa Tostenson

Bachelor's of Science in Mechanical
Engineering
with a Minor in Mathematics
2017 - 2020

[Home](#)

[About Me](#)

[Honors Program](#)

[Contact](#)

ABOUT ME

My name is Annalisa Tostenson. I'm finishing my senior year, earning a bachelor's degree in mechanical engineering with a minor in mathematics. I am in the process of accepting a graduate school admission offer, and I aspire to earn a master's and PhD in robotics.

I have experience both as a Teaching Assistant for introductory engineering courses and a Research Assistant for the Vertical Axis Wind Turbine (VAWT) research on campus. I recently finished leading a small team of undergraduate researchers studying *The Effects of Bisymmetrical and Bilateral Symmetrical Vertical Axis Wind Turbine Designs* and presenting the research at the National Conference of Undergraduate Research (NCUR) and MSU Undergraduate Research Symposium (URS) in spring 2021.

My language proficiency focuses in ASL, and I have completed up to Advanced Sign Language 1 (CDIS307).



[DOWNLOAD FULL CV](#)

RESEARCH INTERESTS

Simultaneous Localization and Mapping
SLAM applications for autonomous vehicles

Swarm Robotics
coordination of multiple robots within a system

Autonomous Navigation
decision-making algorithms for path planning

Robotics Applications in Micro-G Environments
extraterrestrial uses of robots for space exploration

EDUCATION

2017 - 2021
Minnesota State University, Mankato
Bachelor's of Science in Mechanical Engineering

2021 - 2023
Texas A&M University, College Station
Master of Science in Mechanical Engineering

Annalisa Tostenson

Bachelor's of Science in Mechanical
Engineering
with a Minor in Mathematics
2017 - 2020

[Home](#)

[About Me](#)

[Honors Program](#)

[Contact](#)

HONORS PROGRAM

"The thing that I have done throughout my life is to do the best job that I can and to be me."

- Dr. Mae Jemison -



Competency Development

Leadership [Webpage Link](#)

Research [Webpage Link](#)

Global Citizenship [Webpage Link](#)



Annual Proposals

2020 - 21 [Personal Learning Plan Link](#)

2019 - 20 [Personal Learning Plan Link](#)

2018 - 19 [Personal Learning Plan Link](#)



Competency Description

Leadership: the ability to utilize personal leadership values and guide groups toward a common goal.

Research: the ability to exhibit information literacy skills, synthesize and integrate ideas, produce original research or creative works, and contribute to knowledge.

Global Citizenship: the ability to exhibit second language and communication competencies and exhibit cultural competency and awareness.

Why Honors?

Overall, my time in the Honors Program at Minnesota State University, Mankato has been very fulfilling and made a great contribution to my personal and career experiences. The main takeaway I learned from the Honors Program was to go the extra mile, and not just stop at the bare minimum requirements. Most of my classes focus on skills that are very specific to my career in mechanical engineering – mathematics, physics, electrical components, programming, etc. However, the Honors Program encourages students to go outside of their comfort zone and participate in extra courses and activities outside of the normal major.

One great example of this was the language proficiency. I started taking American Sign Language (ASL) courses because of the guidelines of the Honors program, and have now learned a new and useful skill that I am very passionate about. I have had several very meaningful interactions with members of the deaf community, and used ASL to communicate with other students extensively. I was put to the test in my advanced sign language class, where our teacher was completely deaf, and all of the students used sign language to communicate. Although I don't know many deaf people in my personal life, I even surprised myself with my own abilities to communicate very fluidly with people who had ASL as their native language. I was pushed out of my comfort zone to learn a new skill, and after much study was able to use it to consistently interact with members of the deaf community and use ASL on a near daily basis for several semesters. It raised my self confidence and helped prove to myself that I was capable to utilizing these new tools in everyday life.

When I was invited to join the Honors Program at the end of my freshman year, I was very excited to get involved and start learning, even though I didn't know how this was going to fit in with engineering. For a long time, I saw them as two separate tracks: engineering on one side and Honors on the other. My first year was spent trying figure things out, but then it all started to come together. During the end of my sophomore year, I started gaining new experiences in engineering that I realized were very closely related to what we were learning about in Honors. I started performing undergraduate research and became a leader in design teams, as well as using my global citizenship skills to communicate better with my classmates. I realized that it wasn't two separate paths; they were very closely intertwined.

Through my experiences in Honors, I learned that I wasn't just adding on extra activities to my course load, I was also using the guidance and support from the Honors Program to learn more from the things I was already doing. Taking my research for example, through the Honors program I was able to reflect more deeply on my experiences, learning how to stop and take a closer look at what I was doing and how to apply it to my career. I was learning how to look introspectively and take away more from my leadership, research, and global citizenship experiences that pertained directly to my major.

It is very clear to me that my participation in the Honors Program has made me a more well-rounded individual, given me tools that make me a better engineer, developed my communication skills, raised my self-confidence in my own abilities, and taught me to always seek out new opportunities to expand my perspective. Even though some of the required classes and competencies may seem unrelated to my major of mechanical engineering, I have seen over time how they actually do build onto my current courses and broaden my abilities in other areas of my career, education, and personal life.

Annalisa Tostenson

Bachelor's of Science in Mechanical
Engineering
with a Minor in Mathematics
2017 - 2020

[Home](#)[About Me](#)[Honors Program](#)[Contact](#)

Synthesizing Leadership Essay

Starting out, I felt that the term “leadership” was just another industry buzzword. It seemed like employers in the corporate world use the term “leadership” in the same way they over-use other trite business jargon, like “innovation” and “synergy”. Words that are over-used without explanation tend to lose their power and meaning; I was skeptical of the idea at best. This is where my leadership journey began: it started with resetting my whole approach and relearning the definition of leadership. After getting a new foundation of the basics, that was when I really started to see growth in my abilities. Looking back at the mental map of my experiences, I can clearly identify a shifts in my applied leadership philosophy towards becoming more team-oriented, and the transition from transactional to transformational leadership. This change directly impacts me now, as a mechanical engineering major and team-member, both formal and informal leadership are crucial to the success of our work.

My initial leadership education was through the Civil Air Patrol Cadet Program; there were several books I read, camps I attended, and local activities I participated in that contributed to the reset my view on the word “leadership” and what it truly meant to me. In the beginning, I was definitely not a leader yet, but I did get to witness some strong leadership in action and learned the basics of teamwork and communication. As a natural introvert, these experiences with teamwork pushed me out of my comfort zone and forced me to engage with other people to work towards a common goal. I learned why teamwork is important, and developed a further understanding of heightened accomplishment through interaction. Although this may seem insignificant to some, this was a large step for me. I moved from being isolated and skeptical of others to welcoming interaction. My eyes had been opened to the usefulness of teamwork, and the guidance that leadership provides. I transitioned from being an independent, isolated individual to a team-mate and aspiring leader.

At this point, my abilities to lead were still in the transactional stages. I continued my experiences in the Civil Air Patrol while simultaneously beginning attendance at MSU. I had the opportunity to attend several leadership development programs and throughout the years, building onto my experiences in Honors competency development. Over the summer of my sophomore year, I took HONR401: Leadership and Interpersonal Communication. In this course, I gained a lot of technical knowledge regarding different leadership methods and philosophies; I conducted research papers and case study projects to learn more about real-life leadership. Although I still lacked experience in leadership – especially in the field of engineering – I had several introductory experiences with leading teams and was building a new toolbox of leadership skills through my coursework.

This is when my leadership really began to take off. I saw myself developing my leadership philosophy, applying what I had learned, and transitioning to a transformational leadership style, focusing on: idealized influence, inspirational motivation, intellectual stimulation, and individual consideration. In a knowledge-work field like engineering, a focus is placed on utilizing the full-range of the team’s ability. I found that instead of viewing leadership as being “in charge”, a more effective approach is to view it as an opportunity to support the team and empower people. I worked on both a Junior and Senior design team, became an officer in the American Society of Mechanical Engineers, and even took on a role as a leader in my undergraduate research team. As a leader in design and research teams, I gained more pragmatic leadership experience that directly relates to my field. I focused my efforts on giving others a voice, getting the team involved, and guiding the group towards a desired goal. As president of ASME, I took on a mentoring role, introducing new officers to leadership and passing on the knowledge I had learned. I focused on using those transformational leadership styles to develop myself, and those around me.

Looking back at my journey in the Honors program, I have come a long way in my leadership - going through the phases of learning, reflecting on, and applying new skills. As a mechanical engineer, knowing how to communicate and function well within a team is of critical importance. Even in our introductory engineering courses, we are advised against being a “lone wolf” and told to embrace teamwork. I have learned so much from these past leadership experiences – both as a formal and informal leader. As a formal leader, I now know how to foster engagement and direct the efforts of an engineering team to be successful in our goals. Even when I am not in a formal leadership role, I can use my leadership philosophy as an indirect leader to involve the whole team and become stronger together. While I have learned a lot from the past four years in university, I recognize that I still have much to learn and experience as a leader in mechanical engineering, and how to better support the engineers around me.

[SENIOR DESIGN](#)[ASME OFFICERSHIP](#)[JUNIOR STUDENT DESIGN](#)[HONR401: LEADERSHIP PROJECT](#)[CIVIL AIR PATROL](#)

Annalisa Tostenson

Bachelor's of Science in Mechanical
Engineering
with a Minor in Mathematics
2017 - 2020

[Home](#)

[About Me](#)

[Honors Program](#)

[Contact](#)

Synthesizing Research Essay

Of the three Honors competencies, Research has by far had the most impactful influence on my career and education. I have gained exposure to new career paths in mechanical engineering, learned crucial experimentation and documentation skills, as well as gained pragmatic experience in the field. In the beginning, I had no idea how much research would impact me as a mechanical engineer; throughout my time as a student, my experiences in research have actually shaped who I am, and directed the career path that I would take. Because of my experiences through research and the Honors program, I decided last year that I wanted to pursue graduate education through a thesis master's program. I have been accepted to a research university graduate program for the Fall 2021 to earn a master's degree through academic research, and plan to continue focusing on research throughout my career. Looking back, I went through several main stages while becoming accustomed to research and the required skills, such as: an adjustment phase, a collaborative phase, and an initiative phase. At each main stage, I learned a new core set of skills to apply to my research and honed my focus further into research applications in my career field.

My initial research experience was through courses and research projects, such as the research paper for the HONR401: Leadership and Interpersonal Communication course. This set the foundation for my future research education by teaching me about literature reviews, how to glean information from technical publications, and how to synthesize the findings into a conclusive communicable result. I also began to dabble in the mechanics of formal writing and varying communication styles. Although I was not conducting any original research, I was working on my own to identify resources to utilize for gathering data on a specific topic and writing a report on the findings. Through this experience, I started in an introductory phase – getting adjusted to the new method of information usage and writing – and began to advance to utilizing these new skills in career specific applications.

After building this solid foundation, I moved onto using my new skills through collaborative projects; this started with the Vertical Axis Wind Turbine (VAWT) research hosted by the Mechanical and Civil Engineering department at Minnesota State University, Mankato. I started working for Dr. Patrick Tebbe and Dr. Nazli Yilmaz-Wodzinski as an undergraduate research assistant, assisting with data collection in the wind and fluids labs on campus. I worked with several other undergraduate researchers, with guidance from our faculty advisors and graduate students, to use technical equipment to measure the fluid flow fields around the VAWTs. We used this collected data to make maps of the single and double VAWT layouts, and to come to conclusions regarding optimal VAWT locations in pairs. Through this experience, I got a large amount of hands-on experience with lab procedures and data collection. I also learned about data analysis using MATLAB programs, as well as attention to detail through keeping a thorough lab notebook recording data and methods. Although I was not deciding what experiments to conduct, I was able to work with a team to collect the data and come to some preliminary conclusions from a basic analysis. After spending two years developing this solid knowledge base in engineering research, I took one step further into a leadership and initiative phase.

During my senior year, I have had the opportunity to move into a leadership position for the VAWT project and mentor other undergraduate researchers. I learned new executive level skills, such as communication, scheduling, planning experiments, and leading data collection and analysis. I got a much more in-depth look into formal report writing and written communication as well. While working with my team, we came up with some interesting questions regarding the effects of bisymmetric and bilateral symmetric wind turbine designs. We spoke to our advisors, and wrote an abstract to submit to the National Conference on Undergraduate Research (NCUR). We were accepted in January, and are now collecting further data to present at the virtual conference in April. For this, I worked independently to come up with a research question, communicate a basic process, and write an abstract for submission. I am also gaining experience leading others in the lab and providing mentoring for these students. Finally, I have also had the opportunity to exercise my research skills outside of areas related specifically to engineering through the capstone project for the class I am taking in Psychology of Women (PSYC460W). I decided to do a research project on something applicable to my career that I am very passionate about: the representation of women and minorities in Science, Technology, Engineering, and Mathematics (STEM) fields.

Looking back and my journey through the Honors program, I have had so many new and interesting opportunities to develop my research abilities – progressing through the phases of learning, collaborating, and taking initiative as a lead researcher. These experiences have helped shape myself as an engineer, as well as my career as I am now continuing on in research through a graduate degree. I have learned an incredible amount and developed skills that contribute directly to my work as a mechanical engineer; I hope to continue gaining experience in this field and developing my skills as a researcher.

[HONR401: RESEARCH PROJECT](#)

[PSYC460W CAPSTONE PROJECT](#)

[VAWT RESEARCH](#)

[NCUR RESEARCH](#)

Annalisa Tostenson

Bachelor's of Science in Mechanical
Engineering
with a Minor in Mathematics
2017 - 2020

[Home](#)[About Me](#)[Honors Program](#)[Contact](#)

Synthesizing Global Citizenship Essay

I started the Global Citizenship competency as a complete beginner; I was from a small town and had never traveled much to meet new people. There was so much for me to learn about others through class, personal interactions, and my second language courses. There were several clear stages that outlined my development in self-awareness, knowledge and understanding, as well as communication. It began at a surface level, starting a new language and basic interactions with new people from class with various backgrounds. My competencies then progressed to learning more about language and the cultural ties it has, as well as learning to adapt my own customs to communicate in inter-cultural situations more clearly. In the final stages, I've began applying what I have learned into my coursework, and experiencing real-world interactions with others in a second language. All of these different levels of my competency culminate into my Global Citizenship journey.

My initial experiences were through the International Mingle at MSU during my sophomore year, as well as CDIS205: American Sign Language 1. Through meeting international students at the Kearney Center event in the fall, I was able to have conversations with people from many different countries and hear about their experiences with education abroad, inter-cultural travel, and language learning. This was when I first started realizing the broad range of experiences the students at MSU bring to the table, and it opened my eyes to paths students took that were much different than my own. During ASL 1, I started understanding the basic of the new language, the cultural differences between Deaf and hearing people, as well as the communication differences between my own language and ASL. I also learned some cultural communication differences, such as the use of the "deaf" and "Deaf" capitalization to emphasize the difference between the medical condition of hearing-loss (deaf) and the cultural community (Deaf). We discussed the history of sign language and the activism that caused the transformation of laws giving rights to Americans who are disabled. At this time, I was still very new to ASL, and had to work hard to not revert back to my native language especially when communicating with other students and my professor in ASL. I learned new ways to express myself although I was only a beginner in the language, and learned how to navigate social situations – even if I didn't know all of the signs.

I later began attending several Deaf community events on my own outside of the classroom to gain experience communicating and exposure to the culture. I was taking ASL 2 at the time (Intermediate Sign Language), and participated in extracurricular events to develop my own skills. I attended interpreted theatre performances, Deaf religious services, and a comedy event on campus hosting a deaf comedian. During this time, I become more aware of my own habits and customs, and some of the preconceived ideas I had about Deaf culture. I learned about some of the common ground that hearing and Deaf people have culturally – like comedy, theatre, and spirituality – and experienced some of the differences of how these play out in practice. I had several interactions with deaf people, signing about casual topics and practicing my ASL. This communication was very scary at first, and I had to move out of my comfort zone to talk to people. I left the experience feeling more confident in my communication abilities, and was excited to continue pursuing opportunities to interact with the Deaf community.

In my final years at MSU, I took ASL 3 (Advanced Sign Language) as well as Psychology of Women. In ASL 3, our professor was Deaf and used only ASL to communicate with students in class. This gave a great opportunity to interact with native ASL users and discuss important topics that affect the Deaf community – like the coronavirus pandemic and translation legislature. We had several papers and a capstone project to not only learn about the Deaf community, but also to practice our ASL with native speakers. In Psychology of Women, I am doing a capstone project regarding women's representation in STEM and the impacts of intersectionality in this industry.

Reflecting on my Global Citizenships experiences through the Honors program, I have learned so much about language, culture, and communication through both courses and extra-curricular activities. I have met several new people from various backgrounds, learned about other cultures, and practiced speaking and signing with members of both the Deaf and hearing communities. The skills that I have learned will continue to be applied throughout my education and career through interpersonal interaction and communication with others. However, there are still many aspects of ASL I don't understand about the language and culture. Even though I will be graduating in the spring, learning about global citizenship will be an on-going process and will continue for the rest of my life. No matter where my career takes me, there will be plenty of opportunities to become involved in local communities and interact with people who have much different life experiences than myself. I hope to seek out future opportunities to meet new people, develop my language competencies, and learn new skills that I can apply as a mechanical engineer in my field.

[CDIS205: AMERICAN SIGN LANGUAGE I](#)[INTERNATIONAL MINGLE](#)[DEAF COMMUNITY EVENTS](#)[CDIS206 AND 207: AMERICAN SIGN LANGUAGE II AND III](#)[PSYC460W: CAPSTONE PROJECT](#)

Annalisa Tostenson

Bachelor's of Science in Mechanical
Engineering
with a Minor in Mathematics
2017 - 2020

[Home](#)

[About Me](#)

[Honors Program](#)

[Contact](#)

CONTACT INFORMATION

annalisa.tostenson@mnsu.edu

annalisa.tostenson@gmail.com

annalisa.tostenson@tamu.edu

Name

Email

Subject

Message

Submit