

Tyler M. Hummer

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Education

Northwestern University | McCormick School of Engineering | Evanston, IL

Master of Science in Mechanical Engineering

Expected Graduation: 2024

Interests: Entrepreneurship, Design, Toy Design, Modular and Shapeshifting Robots, STEM Education

GPA: 3.98/4.00

Union College | Schenectady, NY

Bachelor of Science in Mechanical Engineering

Graduated June 2021

GPA: 3.87/4.00

Design Experience

Toy Inventor, Co – Founder and CEO

Evanston, IL, Spring 2024

Sanooke Toys – sanooke.com (sanooke = fun in Thai!)

- Founded a toy company centered around STEM education, spun off from my personal robotics research project.
- Conducted play-testing in toy stores and the Museum of Science and Industry Robotics Block Party to inform product design.
- Received non-dilutive funding from *The Garage* at Northwestern to participate in their Jumpstart startup accelerator.
- Interviewed candidates and formed a student team of engineers, designers, and marketers for the company.
- Currently networking and building relationships with inventors, manufacturers, and distributors within the toy community.

Product Management

Evanston, IL, Winter 2024

MatchUp – “Find Your Match, Play Your Game”

- Worked with a team to build a digital product to help people find community during life transitions through pickup sports.
- Conducted market research with potential users and stakeholders throughout the Chicagoland area.
- Summarized research findings and product requirements in Market and Product Requirements Documents (MRD & PRD).
- Prototyped the user interface on Figma and presented project to classmates and judges during a mock pitch competition.

Design Research

Evanston, IL, Winter 2024

Graduate Students and Mental Health

- Defined a human-centered research question based on an affinity group I was a part of.
- Conducted interviews using both “short intercept” methods, as well as “long interviews.”
- Coded interviews using data pointing, theming, and identifying insights.
- Turned insights into “how might we...” questions for crafting human-centered solutions.

ME Mechanical Design Capstone Project

Schenectady, NY, Winter 2021

Custom Robotic End-Effector for Laying Up Carbon Fiber Drone Bodies, Vistex Composites LLC

- Toured manufacturing facilities and interviewed technicians and supervisors to understand pain points towards an MVP.
- Brainstormed multiple design approaches for effectively forming carbon fiber sheets to target mold shape.
- Prototyped and iterated designs with engineering team.
- Presented engineer design process, final design concept, and prototype to engineering faculty and industry mentors.

Manufacturing and Assembly Optimization

Schenectady, NY, Fall 2019 – Winter 2020

Entrepreneurs of the Nott, Schenectady ARC

- Networked with local non-profit agencies to develop plans for interdisciplinary projects with EON.
- Toured manufacturing and assembly facilities, interviewed managers and employees, and identified pain points.
- Designed, prototyped, and iterated with interdisciplinary team of students to streamline processes for increased efficiency.

Research Experience

ME Robotics Research

Evanston, IL, Fall 2022 – Current

Shapeshifting Multi-cellular Robots and Modular Robotics Educational Toolkits

- Conceptualized, designed, and implemented non-cubic modular robots using rhombic dodecahedra shaped unit cells.
- Submit provisional patent application for rhombic dodecahedra cells as educational toy building blocks for spatial development.
- Mentor undergraduate and high school students on hardware implementation of robotics projects.

Technological Tools for Thinking and Learning

Evanston, IL, Winter 2023

Velo: Exploring Animal Behavior Modeling through Hybrid Robotics-Simulation Learning Experience

- Designed a low-cost, modular robotic platform that integrates with agent-based simulation to create a hybrid learning experience.
- Planned curriculum using the platform to teach underlying sensor-motor neural connections for complex behaviors in animals.
- Presented and demoed platform at *Interaction, Design, and Children Conference* (IDC 2023).

ME Undergraduate Research Capstone

Schenectady, NY, Fall 2020 – Spring 2021

Associations Between Humeral Head Surface and Habitat Use in Cercopithecids

- Investigated the articulating surface of 3D-scanned proximal humeri for various primate species.
- Designed pipeline for mesh fixing, local curvature approximation, and data analysis of scanned samples.
- Showcased research findings during Union College's Steinmetz Symposium.

Leadership Experience

Co-Founder and Project Mentor

Schenectady, NY, Winter 2019 – Spring 2021

Entrepreneurs of the Nott (EON)

- Collaborated with interdisciplinary team to found Union College's first entrepreneurial and design club.
- Built a supportive environment to allow creative approaches to real world problem-solving on and off campus.
- Mentored individuals and project leaders on best practices for organization, teaming, and networking.

Co-Founder and President

Schenectady, NY, Fall 2017 – Spring 2021

Union College Club Basketball Team

- Composed club constitution, drafted annual budget, and organized student recruitment events.
- Fostered relationships and mentored younger students in academic, personal, and sports contexts.

Executive Board

Schenectady, NY, Winter 2018 – Fall 2020

Intervarsity Christian Fellowship

- Organized weekly Large-Group meetings; including scheduling guest speakers, church sign-ups, and weekly study topics.

Vice President

Schenectady, NY, Fall 2018 – Spring 2020

Union College Outdoors Club

- Planned weekend hiking, camping, and paddling trips in NY Capital Region, Catskill Mountains, and Adirondacks
- Organized transportation, student sign-ups, budget, and equipment necessary to carry out trips.

Work Experience

English Language Teacher

Sop Prap, Lampang, Thailand, Summer 2021 – Spring 2022

Sop Prap Pittayakhom, American Thai Foundation

- Taught conversational English to middle and high school students situated in rural northern Thailand.
- Instituted extracurricular efforts to further student interest in foreign language and culture including basketball club, lunchtime jam sessions, and an English speech competition.

3D Printing Technician

Schenectady, NY, Winter 2019 – Spring 2021

Union College MakerCore

- Communicated with students and faculty to provide 3D printed parts and models using FDM and SLA printers.
- Troubleshoot machine malfunctions and tune parameters for optimal printing consistency.
- Led facility tours for high school students showing equipment, demos, and answering technical and non-technical questions.

Construction and Maintenance Staff

Central Region, NY, Summer 2018 – Summer 2020

New York State Parks and Historic Preservation

- Carried out general maintenance tasks across three different parks and historic sites in the central region.
- Assisted in new construction, demolition, and restoration of facilities.

Teacher Assistant

Madison, NY, Winter 2019 – Winter 2021

Madison Central School District

- Taught lessons alone or in assistance to lead teachers for Pre-K to 12th Grade classes in all subject areas.
- Chaperoned field trips and helped with after school activities including Athletics, JV basketball, and Varsity basketball.

Floor Manager

Madison, NY, Fall 2013 – Present

Cherry Valley Auction Barn

- Direct team on responsibilities, assist team members, and problem solve to ensure a smooth and enjoyable auction experience.
- Foster professional relationships with customers to encourage repeat attendance.

Volunteer Experience

Youth Basketball Coach and Referee

Chicago, IL, Winter 2023 – Present

Chicago City Parks District

- Plan and lead drills and scrimmages weeknights for groups of 10 – 20 student athletes.
- Coach a high school division team, referee games for younger age groups on Saturday mornings.

Assistant Soccer Coach

Sop Prap, Lampang, Thailand, Winter 2022

Sop Prap Pittayakhom

- Coached and travelled with high school level team for league, province, and northern region tournaments.
- Connected with students outside of the classroom through sports medium.

Adoption Processing Assistant

Schenectady, NY, Winter 2017 – Winter 2020

Homeward Bound Dog Adoption Center

- Cared for dogs of all ages and breeds up for adoption.
- Answered questions and helped with paperwork processing for prospective homes.

Youth Basketball Coach

Madison, NY, Winter 2016 – Winter 2018

Madison Youth Basketball

- Planned practices, communicated with parents, and mentored young student athletes.

Awards and Recognitions

- Omicron Delta Kappa National Leadership Honor Society
- Pi Tau Sigma Mechanical Engineering Honor Society
- Tau Beta Pi Engineering Honor Society
- Dean's List (2017-2021)
- Klemm Fellowship
- Presidential Scholarship
- Donna Phillips Endowed Scholarship
- American-Thai Foundation Fellowship

Coursework

- **Engineering Courses:** Advanced Mechatronics, Swarms and Multi-Robot Systems, Introduction to Artificial Intelligence, Soft Robotics, Mechanistic Data Science, Manufacturing Processes.
- **Design Courses:** Design of Technological Tools for Thinking and Learning, Design Research: Learning to See People and Their Patterns, Differentiation by Design, Design of Mechanical Systems, Sculpture I and II.
- **Entrepreneurship Courses:** Engineering Entrepreneurship, Entrepreneurship in Emerging Markets, Product Management, Backable: Building an Innovation Practice.

Skills & Abilities

- Programming Languages: Python, C, MATLAB
- Software Packages: SolidWorks, Fusion360, Onshape, KiCad, Blender, Adobe Premier Pro, Adobe Illustrator
- Design Skills: 3D Modeling, FDM 3D Printing, SLA 3D Printing, breadboarding, soldering, laser cutting, stick welding, MIG welding, oxyacetylene torch cutting, metal forging, general woodworking.

Publications and Presentations

Hummer, Tyler M., Sam Kriegman. "A non-cubic space filling modular robot." *2024 IEEE International Conference on Robotics and Automation (ICRA)*. IEEE. 2024.

Mongkhonvanit, Kritphong, Tyler M. Hummer, and John Chen. "Velo: Exploring Animal Behavior Modeling through Hybrid Robotics-Simulation Learning Experience." *Proceedings of the 22nd Annual ACM Interaction Design and Children Conference*. 2023.

Hummer, Tyler M., "Association Between Humeral Head Surface and Habitat Use in Cercopithecids." *Union College Steinmetz Symposium*. June 2021.