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, Product Development, Robotics, 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.

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.

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.

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

Strgar, L., Matthews, D., Hummer, T., & Kriegman, S. (2024). Evolution and learning in differentiable robots. *Robotics Science and Systems (RSS)*. 2024.

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.