Joseph Liechty

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Website: *https://www.robot-baseball.com*

Education

Ph.D. Candidate, Computer Science (Robotics and AI) University of Utah *2024 – 2028*
Kuntz Lab

M.S. Degree, Mechanical Engineering (Robotics), University of Utah *2022 – 2024*
GPA: 3.89/4.00
Human-Centered Haptics and Robotics Lab

B.S. Degree, Mechanical Engineering, Brigham Young University *2015 – 2022*
GPA: 3.89/4.00
Mars Rover Team, Mini-Baja Club, Rocketry Club, Student Innovator of the Year

Skills

Controls	Python	Product Development
Dynamics	ROS2	Communication
Mechatronic Systems	MATLAB	Problem Solving
Robotics	C++	Peer Leadership
AI/ML	SolidWorks	Time Management

Experience

Graduate Research Assistant: *Kuntz Lab, U. of Utah*
Aug. 2024 – Present
20 hours/week
- ∞ Researching autonomous decision making and task planning
- ∞ Studying human-robot interactions (specifically the handover of objects)
- ∞ Designing robotic systems using ROS2, Kuka and Kinova robotic arms, depth cameras

Teaching Assistant: *Computer-Based Problem Solving for Engineering Systems, U. of Utah*
Aug. 2022 – Dec. 2023, Jan. 2024 – May 2024
20 hours/week
- ∞ Taught freshman to program mechatronic systems and use basic numerical methods
- ∞ Ran weekly lab sessions, lecturing and giving one-on-one instruction
- ∞ Graded and assisted in other course administrative duties

Graduate Research Assistant: *Human-Centered Haptics and Robotics Lab, U. of Utah*
Aug. 2022 – Aug. 2024
20 hours/week
- ∞ Studied user experience in haptic interactions
- ∞ Built haptic knob to deliver physical renderings integrated with GUI programmed in C++
- ∞ Created algorithms for system identification of robot parameters
- ∞ Designed electronics for open-source powered prosthetic leg for Utah Bionics Lab

Robotics Engineer: *Mars Rover Competition Team, Brigham Young University*

Aug. 2021 – Apr. 2022
10 hours/week

- Redesigned robot arm joints for greater range of motion and increased precision
- Integrated ROS path planning tools with rover codebase for obstacle avoidance
- Designed rover rocker-bogie suspension to fold to meet size requirements
- Manufactured custom parts with optimized strength-to-weight ratios

Undergraduate Research Assistant: *Design Exploration Lab, Brigham Young University*

Apr. 2020 – Apr. 2022
10 hours/week

- Studied creating market requirements and evaluating prototypes
- Researched modeling environmental impacts of products in agent-based simulations
- Designed machine to test wear of seals for water pumps in developing countries
- Published journal paper on modeling the social and environmental impacts of products

Information Technology Engineer: *J. Rueben Clark Law School, Brigham Young University*

Jun. 2019 – Dec. 2020
20-40 hours/week

- Lead engineer for backup and replication of all faculty and administrative data
- Negotiated multi-year contract for new backup and replication software package
- Maintained and updated Windows servers and Windows active directory environment
- Managed faculty filesharing servers, print servers, and records database

Undergraduate Research Assistant: *CREATE Lab, Brigham Young University*

Jan. 2019 – Aug. 2019
10 hours/week

- Built 3D printer using linear motion stages connected to power supply and computer
- Programmed 3D printer to print simple test prints on powder bed using LabView
- Collected droplet velocity data with high-speed camera and analyzed data in MATLAB
- Published conference paper on the effects of droplet velocity on part porosity

Relevant Publications

Joseph C. Liechty, John. C. Liechty and Edoardo Battaglia, "*A Universal Modeling Approach for Understanding User-Experience in Haptic Interactions*" In Progress

Liechty, J. C., Mabey, C. S., Mattson, C. A., Salmon, J. L., and Weaver, J. M., "Trade-off Characterization Between Social and Environmental Impacts Using Agent-Based Models and Life-Cycle Assessment," Proc. ASME 2022 International Design Engineering Technical Conferences & Computers and Information in Engineering Conference.

References (Contact Information Upon Request)

Alan Kuntz – *Ph.D. Faculty Advisor, University of Utah*

Edoardo Battaglia – *M.S. Faculty Advisor, University of Utah*

Chris Mattson – *Undergraduate Faculty Advisor, Brigham Young University*