Joseph Liechty

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General Information

Education

Ph.D. Candidate, Robotics (Computer Science) University of Utah   *2024 – 2028*
  Learning Lab for Manipulation Autonomy
  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

Expertise

Robotic Manipulation	AI/ML	Python
Controls and Dynamics	Hardware Design	ROS2
Motion Planning	Product Development	C++

References (Contact Information Upon Request)

Tucker Hermans – *Ph.D. Advisor, University of Utah*

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

Chris Mattson – *Undergraduate Advisor, Brigham Young University*

Experience

Research

Graduate Research Assistant: *Learning Lab for Manipulation Autonomy, U. of Utah*
Aug. 2025 – Present
40 hours/week
  - ∞ Studying controller and state estimators for tendon-driven multi-finger hands
  - ∞ Designing control software for magnetic manipulation of objects in space
  - ∞ Combining flow matching for generative modeling with behavior cloning

Graduate Research Assistant: *Kuntz Lab, U. of Utah*
Aug. 2024 – Aug. 2025
20 hours/week
  - ∞ Designed autonomous action generation models for robotic surgery
  - ∞ Studied human-robot handovers of objects and task and motion planning
  - ∞ Designed robotic pick-and-place pipeline using Kuka/Kinova arms, depth cameras

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

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 products for communities in developing countries

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

Teaching

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

Professional and Extracurricular

Robotics Engineer: *Mars Rover Competition Team, Brigham Young University*
Aug. 2021 – Apr. 2022
10 hours/week
- ∞ Improved hardware for robot SCARA manipulator
- ∞ Designed folding rocker-bogie suspension for rover drivetrain
- ∞ Manufactured custom parts with optimized strength-to-weight ratios

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

Publications

Conference and Journal

J. C. Liechty, J. Ferguson, A. Kuntz, and T. Hermans, "Model-predictive motion flows: Unrolling flow matching policies for stable, online motion planning," submitted for publication.

J. C. Liechty, P. Tang, J. C. Liechty, and E. Battaglia, "Holistic user experience in haptics," submitted for publication.

M. A. Schoen, **J. C. Liechty**, I. F. Zeringue, and E. Battaglia, "Design and evaluation of user experience for a virtual reality equine-assisted therapy system," submitted for publication.

J. C. Liechty, C. S. Mabey, C. A. Mattson, J. L. Salmon, and J. M. Weaver, "Trade-off characterization between social and environmental impacts using agent-based product adoption models and life cycle assessment," *Journal of Mechanical Design*, vol. 145, no. 3, p. 032001, 2023.

T. Colton, **J. Liechty**, A. McLean, and N. Crane, "Influence of drop velocity and droplet spacing on the equilibrium saturation level in binder jetting," in *2019 International Solid Freeform Fabrication Symposium*, 2019. doi: 10.26153/tsw/17243.

Workshop Proceedings

J. C. Liechty, A. Belsare, Z. Karimi, J. Koster, D. Brown, and A. Kuntz, ""Hey Medbot": Toward Autonomous Assistants in Operating Rooms," presented at the ICRA Workshop on The Evolving Landscape of Surgical Robotics: Towards AI-Powered Unconventional Instruments and Technologies in the Operating Theatre, Atlanta, GA, USA, May 19, 2025.

J. Prime, **J. Liechty**, H. Zhang, J. Abbott, and E. Battaglia, "An exosuit to assist with arm swing in pathological gait," in *2023 IEEE World Haptics Conference (WHC)*, 2023.

Invited Talks

"Flow matching and generative modeling" Guest Lecture, Deep Learning Class, Univ. of Utah, Salt Lake City, UT, USA, Nov. 2025.