

Jack Lindsay

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Career Interest: Researcher / Design Engineer / Prototyping Engineer

jacklindsay.net

I use mathematical design to invent and develop new sensors, actuators, structures, and controllers. I aim to work in high-impact areas like space exploration, sustainability, biotech, and advanced manufacturing.

SUMMARY OF QUALIFICATIONS

- Concept-to-prototype integrating dynamics, structural mechanics, and fluids
- Built and optimized dynamic mechatronic systems for NASA
- 9 years experience with SolidWorks 3D CAD modeling
- 9 years experience in mechanical design and analysis
- Led teams developing novel products that blend mechanical, electrical, and software systems
- Strong math background modeling sensors, actuators, and reprogrammable materials
- Experience across the shop machining, prototyping, and 3D printing
- Designed and prototyped 7 mechatronic systems, in areas ranging from robotics to remote sensing
- Collaborated with diverse teams in robotics, medical device design, and human interface design
- Strong communication skills and significant experience working independently
- Programming languages: MATLAB, C, Python, LabView

WORK EXPERIENCE

Research Mechanical Engineer

Oculus Research (January 2016 – Present)

- Design, build, test, and analyze soft robotic systems
- Model soft body dynamics and control systems
- Perform analysis and modeling at the system and component level
- Develop and execute long term research plans
- Collaborate with mechanical, electrical, and software engineers and research scientists to tackle tough interdisciplinary problems

Research Engineer - Metamaterials

HCI Lab at the Hasso Plattner Institut (October 2014 – November 2015)

- Designed soft reprogrammable matter that can change its mechanical properties in real-time
- Evaluated new metamaterial structures to control mechanical behavior
- Rapidly solved dynamics and mechanics problems through analysis and testing
- Developed software tools to design metamaterials with a software team
- Collaborated in the mechanical design of virtual reality and robotic systems including haptics

Sensor Design

Eltopia Communications (June 2013 – June 2014)

- Led the team responsible for a farm-focused solid state weather station
- Designed electro-mechanical sensors in collaboration with electrical, software, and design engineers
- 3D modeled and designed mechanisms, sensing elements, and enclosures
- Developed algorithms for detecting rain and wind
- Managed project timeline and deliverables
- Developed relationships with machinists and injection molders
- Physically constructed prototypes and test apparatus
- Designed and ran mechanical testing

Research Assistant

UW BioRobotics Lab (September 2011 – June 2013)

- Worked under Prof. Blake Hannaford on a small team researching haptic feedback

- Designed tactile feedback systems for NASA astronauts
- Mathematically modeled and optimized dynamic electro-mechanical systems
- Conceived and built working prototypes of vibrotactile transmissions
- Sourced components used for construction and evaluation of haptic prototypes
- Designed and performed tests with users to evaluate the system

EDUCATION

University of Washington

Seattle, WA

Masters in Engineering, Mechanical Engineering Department

June 2013

Thesis: Mechanical amplifier for vibrotactile haptics, Fall 2011- Spring 2013

- Designed a compliant mechanical impedance adapter to couple energy from a motor to the skin
- Mathematically simulated and optimized in MATLAB
- Prototyped and tested empirically with human subjects
- Quadrupled the energy transferred to the skin while simultaneously cutting power into the motor

Relevant Projects:

“MouseBot” – Project for Ubiquitous Computing, CSE 599, Winter 2012

- Small-scale mobile robot built to explore applications of home-based robotics
- Team leader, responsible for system design, test design, and analysis

“Kinect fastSLAM” – Project for Robotics and Artificial Intelligence CSE71, Spring 2012

- Mobile robot SLAM using a point cloud-based particle filter
- Written independently, run on ROS

“InnerSol” – Project for Hardware Design Capstone, CSE 499, Spring 2012

- Robotic system to grow plants, monitor environmental data, and control pumps and lights
- Used a data-base of information on plant life cycles to tailor the growth inputs
- Team leader, responsible for mechanical design, electronic embedded architecture, and group coordination

Relevant Coursework:

CSE 571 Robotics and Artificial Intelligence	CSE 599 Ubiquitous Computing	EE 589 Advanced Topics in Sensors
ME 564 Ordinary Differential Equations	ME 565 Partial Differential Equations	CSE 528 Computational Neuroscience
EE 472 Microcomputer Systems	ME 547 Linear Systems Theory	ME 504 Intro to MEMS
EE 543 Robotic Manipulation	CSE 477 Digital System Design	

Hampshire College

Amherst, MA

Bachelors of Arts, concentration in Mechanical Engineering

May 2011

Thesis: Design and Prototyping of an Experimental Electric Vehicle, Fall 2010 – Spring 2011

- Designed an electric vehicle based on wheel hub motors with a tandem control configuration
- Organized and lead a team to build and test the system
- Planned the entire project and managed scheduling, CAD design, kinematic modeling, stress analysis, physical construction and all testing
- Built by hand from scratch and tested using finite element analysis and real-world road tests
- Carried one rider up to 225 lbs at a speed of 35 mph with an acceleration of 2.1g

Relevant Projects: Human-scale wind turbine, algae-based photobioreactor, passive solar home

PUBLICATIONS

1. **J. Lindsay**, R. Adams, and B. Hannaford, “Improving Tactile Feedback with an Impedance Adapter,” IEEE World Haptics Conference, Daejeon, Korea, 2013.
2. I. Jiang, Y. Ishikawa, **J. Lindsay**, B. Hannaford, “Design and Optimization of Support Structures for Tactile Feedback,” IEEE World Haptics Conference, Daejeon, Korea, 2013.
3. **J. Lindsay**, I. Jiang, R. J. Adams, S. Patel, B. Hannaford, “Good Vibrations: An Evaluation of Vibrotactile Haptic Amplification for Low-Power Wearable Applications,” UIST, St. Andrews, UK, October 2013.
4. R. J. Adams, A. Olowin, E. Krepkovich, B. Hannaford, **J. Lindsay**, P. Homer, J. T. Patrie, O. S. Sands, “Glove-Enabled Computer Operations (GECO): Design and Testing of an Extra-Vehicular Activity Glove Adapted for Human-Computer Interface,” ICES, Denver, 2013.
5. Ion, A., Frohnhofen, J., Wall, L., Kovacs, R., Alistar, M., **Lindsay, J. I. C.**, Lopes, P., Chen, H., Baudisch, P. “Metamaterial Mechanisms,” UIST 2016, Tokyo, Oct 2-5, 2016.

In my free time

I play go, read books on cognition, and brew strange beers.