Pragna Mannam, Ph.D.

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Roboticist looking for engineering and research roles developing real robotic systems to intelligently interact with its environment.

Skills

Robotic Manipulation, Robot Hardware Design, Feedback Control, Python, C++, ROS, CAD

Education

Ph.D. in Robotics, Carnegie Mellon University Advisors : Prof. Nancy Pollard, Prof. Jean Oh
Thesis Title: **Design Iteration of Dexterous Compliant Robotic Manipulators** *January 2024*

MS in Robotics, Carnegie Mellon University Advisor : Prof. Matthew T. Mason
Thesis Title: **Model-free Sensorless Manipulation** *May 2019*

BS in Electrical and Computer Engineering, Carnegie Mellon University Advisor : Prof. Matthew T. Mason
May 2017

Internships

Sensorization of Compliant Delta Robot Manipulators *(April 2021-22)*
Manager: Abhinav Gupta and Tess Hellebrekers, *Meta AI*, Pittsburgh, PA, USA

- Developed state estimation of soft delta robot end-effector using magnetometer sensors for closed-loop control

Manipulation of Deformable and Rigid Objects *(Summer 2018)*
Manager: Dr. Katharina Muelling, *National Robotics Engineering Center* (NREC), Pittsburgh, PA, USA

- Learned suction gripper grasp strategies with force-torque feedback for deformable and rigid objects

Hydraulic Off-Road Vehicle Conversion to Electric Steer-by-Wire *(Summer 2016)*
Manager: David A. Johnson, *John Deere*, Cary, NC, USA

- Designed electrical wiring foundation for addition of "smart" capabilities to aid user

Research Projects

Design Iteration for Dexterous Anthropomorphic Soft Robotic Hands *2022-2024*
Advisor: Prof. Nancy Pollard, Prof. Jean Oh, Carnegie Mellon University, Pittsburgh, PA, USA (*PhD thesis*)

- Designed customizable tendon-driven anthropomorphic hands with soft materials **Best Oral Paper Finalist**
- Enabled rapid design optimization of dextrous hand by closing sim-to-real-gap **Best Demo Finalist**

Compliant Delta Manipulator Fingers for Autonomous Manipulation *2019-2022*
Advisor: Prof. Zeynep Temel, Prof. Oliver Kroemer, Carnegie Mellon University, Pittsburgh, PA, USA

- Designed Delta parallel manipulator with flexural hinges as modular fingers for dexterous manipulation tasks

Sensorless Pose Determination using Randomized Action Sequences *2015-18*
Advisor: Prof. Matthew T. Mason, Carnegie Mellon University, Pittsburgh, PA, USA (*Masters thesis*)

- Developed randomized deterministic action sequences to reorient objects from unknown initial states

Awards and Media

- **Best Demo Finalist** at 2024 IEEE-RAS International Conference on Soft Robotics
- **Best Oral Paper Finalist** at 2023 IEEE-RAS International Conference on Humanoid Robots
- Kanaka Muira Award at 2023 IEEE-RAS International Conference on Humanoid Robots
- 2022 Intelligent Symbiotic Systems Moonshot Funding from CMU College of Engineering
- Soft Robotic Hand Design featured in New York Times Article *This Robot Can Paint. But Is It Art?*, *May 2023*
- Filmed Sensorless Pose Determination project for WQED Series on workforce development as a result of technological changes and automation, *Aired on March 21, 2019 at 8pm EST*

Select Publications

Google Scholar page

Conference and Journal Publications:

- *P. Mannam*, X. Liu, D. Zhao, J. Oh, & N. Pollard. Design and Control Co-Optimization for Automated Design Iteration of Dexterous Anthropomorphic Soft Robotic Hands. In 7th IEEE-RAS International Conference on Soft Robotics (RoboSoft), 2024. **Best Demo Finalist**
- A. Kannan, K. Shaw, S. Bahl, *P. Mannam*, & D. Pathak. DEFT: Dexterous Fine-Tuning for Hand Policies. In 7th Annual Conference on Robot Learning (CORL), 2023.
- *P. Mannam*, K. Shaw, D. Bauer, J. Oh, D. Pathak, and N. Pollard. Designing Dexterous Anthropomorphic Soft Hands through Interaction. In IEEE-RAS International Conference on Humanoid Robots, 2023.
  Best Oral Paper Finalist
- *P. Mannam*, A. Rudich, K. Zhang, M. Veloso, O. Kroemer, and F.Z. Temel.
  A Low-Cost Compliant Gripper Using Cooperative Mini-Delta Robots for Dexterous Manipulation.
  In Robotics: Science and Systems (RSS), 2021.
- *P. Mannam*, O. Kroemer, F.Z. Temel,
  Characterization of Compliant Parallelogram Links for 3D-Printed Delta Manipulators. In International Symposium on Experimental Robotics (ISER), 2020.
- *P. Mannam*, A. Volkov Jr., R. Paolini, G. Chirikjian, M. T. Mason.
  Sensorless Pose Determination using Randomized Action Sequences. *Entropy*, 21(2), 154. 2019.

Leadership Experience and Outreach

- **SCS Dean's PhD Student Advisory Committee, CMU** *(Dec '19 - Dec '23)*
- **Robotics Institute Climate Committee, CMU** *(Feb '20 - Feb '21)*
- **Vice-President of Graduate Student Life**, Graduate Student Assembly, CMU *(Aug '18 - May '19)*
- **Provost Search Committee and University Student Affairs Council** *(Aug '18 - May '19)*
- **Department Representative and Advocate**, Graduate Student Assembly, CMU *(Aug '17 - Jul '18)*
- **Executive Member**, Society of Women Engineers *(Jun '15 - May '17)*