Phillip Tran

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Objective

Seeking a full-time position in engineering and development. I have extensive experience in full system integration and design in the field of robotics, which has allowed me to develop my proficiency and knowledge in designing, developing, and analyzing robotic and electromechanical systems. My primary area of focus is on mechanism design, particularly in actuation systems and sensors. I also have experience in full ownership of complete robotic systems, which I learned through my research experiences in my PhD and postdoc. This also helped give me experience in rapid prototype iteration and development, both in hardware and software. Additionally, I have worked with roboticists and clinicians to further the development of my work in a collaborative and team-focused environment.

Education

Georgia Institute of Technology, Atlanta, GA — May 2023
Ph.D. in Robotics

University of Maryland, College Park, MD — May 2017
B.S. in Bioengineering

Relevant Skills

General: CAD, Modeling, Controls
Coding: C++, Python, ROS2, Kotlin, MATLAB, Simulink, C
Software: SolidWorks, MoveIt Pro, OnShape, Android Studio, Eagle
Machining/Fabrication: 3D-printing, Laser-cutting, Additive manufacturing
Languages: Chinese (professional)

Experience

Takeda Pharmaceutical — 03/2025 - present
Senior Robotics Engineer

- Creating **automated solutions for high-throughput experimentation strategies** in synthetic molecule process development.
- Developing **movement planning software in ROS2 using MoveIt Pro** to integrate Universal Robot arms into the pharmaceutical experiment/testing workflow.
- Designing custom hardware and actuation solutions for a **full automation workflow targeting oligopeptide spectroscopy** using a ABB YuMi.
- Writing and integrating **custom Ethernet and USB drivers** to facilitate communications between microcontrollers and ROS2/Unchained Labs software.

Harvard Medical School/Boston Children's Hospital — 03/2024 - 03/2025
Postdoctoral Research Fellow

- Designed, developed and tested **a robotic system for tendon-controlled steerable surgical catheters** focusing on cardiac procedures.
- Formulated and wrote **real-time control software in ROS2** to enable inverse kinematic control of surgical catheters.
- Conducted **experimental evaluations of the developed robotic system** to evaluate applicability to clinical setting and operations.

Aurora Flight Sciences — 01/2023 - 02/2024
Robotics Research Engineer

- Developed and implemented **software test automation for the Boeing Orca extra-large unmanned undersea vehicle (XLUUV) controllers** for on-vehicle hardware and electrical components.
- Developed **experimental hardware for testing of a real-time adaptive neuro-controller** for a small unmanned surface vehicle with applicability towards larger manned surface vehicles.

- Formulated, designed, and submitted various invention disclosures concerning technologies applicable to **small unmanned aerial vehicles and robotic grasping/manipulation**.

Medical Robotics and Automation (RoboMed) Laboratory 08/2017 - 12/2022

Graduate Research Assistant

- Developed a **voice-controlled, tendon-driven soft robotic hand exoskeleton** (PATENTED) for assistive/rehabilitative purposes for individuals with hand dysfunction.
- **Conducted several case studies** with impaired and unimpaired individuals to evaluate the performance of the developed exoskeleton system in a mock rehabilitative environment.
- Designed, integrated, and tested various **tendon-driven actuators** for exoskeleton operation.
- Designed, integrated, and tested a **dual-photointerrupter-based sensor** to provide force feedback.
- Designed, integrated, and experimentally validated **compact 3D-printed self-sealing suction cups** and the accompanying pneumatic circuit with the hand exoskeleton system to investigate alternative object manipulation modalities.
- Designed, integrated, and tested embedded solutions for **wireless control of the developed exoskeleton** using microcontrollers, WiFi, UART, I2C, and Bluetooth LE.
- Designed, integrated, and tested **several iterations of custom PCBs and circuits** to reduce exoskeleton footprint and improve portability.

Publications

Journal Articles

1. **P. Tran**, D. Elliott, K.R. Herrin, S. Bhatia, and J.P. Desai, "Towards comprehensive evaluation of the FLEXotendon glove-III: a case series evaluation in pediatric clinical cases and able-bodied adults," in *Biomedical Engineering Letters*, doi: 10.1007/s13534-023-00280-0.
2. **P. Tran**, D. Elliott, K.R. Herrin, and J.P. Desai, "Evaluation of the FLEXotendon glove-III through a human subject case study," in *Biomedical Engineering Letters*, doi: 10.1007/s13534-023-00262-2.
3. **P. Tran**, S. Jeong (co-first author), F. Lyu, K.R. Herrin, S. Bhatia, D. Elliott, S. Kozin, and J.P. Desai, "FLEXotendon Glove-III: Voice-Controlled Soft Robotic Hand Exoskeleton with Novel Fabrication Method and Admittance Grasping Control," in *IEEE Transactions on Mechatronics*, doi: 10.1109/TMECH.2022.3148032.
4. **P. Tran**, S. Jeong (co-first author), K.R. Herrin, and J.P. Desai, "A Review: Hand Exoskeleton Systems, Clinical Rehabilitation Practices, and Future Prospects," in *IEEE Transactions on Medical Robotics and Bionics*, doi: 10.1109/TMRB.2021.3100625.
5. **P. Tran**, S. Jeong (co-first author), S.L. Wolf, and J.P. Desai, "Patient-Specific, Voice-Controlled, Robotic FLEXotendon Glove-III System for Spinal Cord Injury," in *IEEE Robotics and Automation Letters*, doi: 10.1109/LRA.2020.2965900
6. S. Jeong, **P. Tran (co-first author)** and J. P. Desai, "Integration of Self-Sealing Suction Cups on the FLEXotendon Glove-II Robotic Exoskeleton System," in *IEEE Robotics and Automation Letters*, doi: 10.1109/LRA.2020.2965895

Conference Proceedings

1. **P. Tran**, S. Jeong, K.R. Herrin, S. Bhatia, S. Kozin, and J. P. Desai, "FLEXotendon Glove-III: Soft Robotic Hand Rehabilitation Exoskeleton for Spinal Cord Injury," in *2021 IEEE International Conference on Robotics and Automation (ICRA)*, Xian, China, 2021.
2. **P. Tran**, S. Jeong, and J. P. Desai, "Voice-Controlled Flexible Exotendon (FLEXotendon) Glove for Hand Rehabilitation," in *2019 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, Macau, China, 2019, pp. 4834-4839.
3. K. Park, **P. Tran**, N. Deaton, and J. P. Desai, "Multi-walled Carbon Nanotube (MWCNT)/PDMS-based Flexible Sensor for Medical Applications," *2019 International Symposium on Medical Robotics (ISMR), IEEE*, Atlanta, GA, USA, 2019, pp. 1-8.
4. X. Wang, **P. Tran**, S.M. Callahan, S.L. Wolf, and J. P. Desai, "Towards the Development of a Voice-Controlled Exoskeleton System for Restoring Hand Function," *2019 International Symposium on Medical Robotics (ISMR), IEEE*, Atlanta, GA, USA, 2019, pp. 1-7.

Patent Applications

J. P. Desai, **P. Tran**, S. Jeong, X. Wang, "Voice-Activated, Compact, and Portable Robotic System," **U.S. Patent Application 17/433,367**, 2022

P. Tran, "Self-Sealing Suction Device," **Boeing Docket No. 23-1618-US-NP**, 2023