# Yash Chitalia

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## Education

**Georgia Institute of Technology**, Atlanta, GA — 12/2020 (expected)
*Ph.D. in Robotics*, Major: Mechanical Engineering — **GPA: 3.91/4.00**
Coursework: Machine Learning, Deep Learning, Robotics, Computer Vision,
Dynamics of Mechanical Systems, Regulatory/Quality Issues in Medical Device Development

**University of Michigan**, Ann Arbor, MI — 05/2013
*M.S. in Electrical Engineering* — **GPA: 3.87/4.00**
Coursework: Embedded Control Systems, Linear Systems, Nonlinear Systems,
Linear Feedback Systems, Probability and Random Processes, Digital Signal Processing

**University of Mumbai**, Maharashtra, India — 08/2011
*B.E. in Electronics Engineering* — **GPA: 3.89/4.00**
Related Coursework: Robotics, Neural networks, Classical Control Systems,
Embedded Systems, Image Processing

## Experience

**Medical Robotics and Automation (RoboMed) Laboratory** — 07/2016 - present
*Ph.D. Student, Advisor: Dr. Jaydev P. Desai*

- Designed a robotic medical guidewire (PATENT PENDING) for assisting in endovascular procedures. This guidewire is only 0.016 inches in outer diameter making it among the smallest robotic catheters in the world.
- Worked on the design, modeling and control of a two degree-of-freedom **robotic neuroendoscopy tool** (PATENT PENDING) with handheld controller and miniaturized force sensors for force based control.
- **Petit Scholar Mentor** for two years consecutively receiving a $5000 grant to mentor two undergraduate students.

**ME 2110: Creative Decisions and Design** — 07/2016 - 07/2018
*Head Teaching Assistant, Instructor: Dr. Thomas Kurfess*

- Led a team of approximately 15-20 Graduate and Undergraduate teaching assistants in successfully teaching a class of approximately 300 students (per semester). The class involved students building robots competing against each other in a final competition. Taught students mechatronics using the myRIO board by NI and machine shop skills.

**Healthcare Robotics Laboratory** — 08/2014 - 07/2016
*Ph.D. Student, Advisor: Dr. Charles Kemp*

- Worked on modifying a standard hospital bed, to convert it to a 'robot' capable of sensing its pose and the pressure distribution of an occupant and modified the system to communicate with a PR2 robot in ROS.
- **Petit Scholar Mentor** for one year receiving $2500 grant to mentor one undergraduate student.

**Lutron Electronics** — 07/2013 - 06/2014
*Senior Project Electrical Engineer*

- Designed embedded software for the implementation of the Lutron proprietary wireless communication protocol in the mass market wireless home automation solutions.

**Controls and Powertrain Research Group, Ford Motor Company** — 06/2012 - 08/2012
*Summer Intern*

- Implemented the 'Vector Reference Governor' predictive control scheme on the linearized models of the Ford Motor Company engines. Also implemented the non-linear version of the reference governor algorithm on the Ford vehicles.

## Leadership Experience

- **Three-term Petit Scholar Mentor**, receiving $7500 grant to mentor three UG students. — 2015, 2018-19
- **Co-organized workshop** on "Convergence of IP, Tech Transfer, and Translation, for Medical Robotics Research" at the 2019 IEEE International Symposium on Medical Robotics. — 2019

## Relevant Skills

- **Coding Skills:** Proficient in Python, C, C++, MATLAB, Simulink, Labview.
- **Software Skills:** Proficient in Solidworks, ROS, AutoCAD, Autodesk Eagle, Autodesk Inventor, ANSYS.
- **Machine Shop Skills:** Femto-second laser micromachining, Parylene coating, Lathe and Milling machine proficiency.

## Publications

### Journal Articles

1. S. Jeong, **Y. Chitalia (co-first author)**, and J.P. Desai, "Design, Modeling, and Control of a Coaxially Aligned Steerable (COAST) Guidewire Robot," in *IEEE Robotics and Automation Letters*, (under review)
2. **Y. Chitalia**, S. Jeong (co-first author), K. K. Yamamoto, J. J. Chern, and J.P. Desai, "Modeling and Control of a Meso-scale Multi-Joint Continuum Robot for Pediatric Neurosurgery," in *IEEE Transactions on Robotics*, (under second round review)
3. S. Jeong, **Y. Chitalia** and J. P. Desai, "Miniature Force Sensor based on Dual-photointerrupter with High Linearity and Disturbance Compensation," in *IEEE Sensors Journal*.
4. **Y. Chitalia**, N. J. Deaton, S. Jeong, N. Rahman and J. P. Desai, "Towards FBG-Based Shape Sensing for Micro-Scale and Meso-Scale Continuum Robots With Large Deflection," in *IEEE Robotics and Automation Letters*, vol. 5, no. 2, pp. 1712-1719, April 2020.
5. **Y. C. Chitalia**, S. Jeong, N. Deaton, J. J. Chern and J. P. Desai, "Design and Kinematics Analysis of a Robotic Pediatric Neuroendoscope Tool Body," in *IEEE/ASME Transactions on Mechatronics*.
6. A.S. Kapusta, P. M. Grice, H. M. Clever, **Y. Chitalia**, D. Park, C.C. Kemp, "A system for bedside assistance that integrates a robotic bed and a mobile manipulator," *PLoS One*, 2019;14(10):e0221854. Published 2019 Oct 16. doi:10.1371/journal.pone.0221854

### Conference Proceedings

1. **Y. Chitalia**, S. Jeong, J. Bok, V. Nguyen, S. Melkote, J. J. Chern, J. P. Desai, "Towards the Design and Development of a Pediatric Neuroendoscope Tool," *2019 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, Macau, China, 2019, pp. 2998-3004.
2. **Y. Chitalia**, X. Wang, V. Nguyen, S. Melkote, J. J. Chern, and J. P. Desai, "Design and Analysis of a Bidirectional Notch Joint for a Robotic Pediatric Neuroendoscope," in *International Symposium on Experimental Robotics*, (pp. 24-33). Springer, Cham., November 2018
3. H. M. Clever, A. Kapusta, D. Park, Z. Erickson, **Y. Chitalia** and C. C. Kemp, "3D Human Pose Estimation on a Configurable Bed from a Pressure Image," *2018 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, Madrid, 2018, pp. 54-61.
4. **Y. Chitalia**, X. Wang and J. P. Desai, "Design, Modeling and Control of a 2-DoF Robotic Guidewire," *2018 IEEE International Conference on Robotics and Automation (ICRA)*, Brisbane, QLD, 2018, pp. 32-37.
5. T. Bhattacharjee, J. Wade, **Y. Chitalia** and C. C. Kemp, "Data-driven thermal recognition of contact with people and objects," *2016 IEEE Haptics Symposium (HAPTICS)*, Philadelphia, PA, 2016, pp. 297-304.
6. **Y. Chitalia**, W. Zhang, B. Hyun and A. Girard, "A revisit-based mixed-initiative nested classification scheme for Unmanned Aerial Vehicles," *2014 American Control Conference*, Portland, OR, 2014, pp. 1793-1798.
7. U. Kalabić, **Y. Chitalia**, J. Buckland and I. Kolmanovsky, "Prioritization schemes for reference and command governors," *2013 European Control Conference (ECC)*, Zurich, 2013, pp. 2734-2739.

## Patent Applications

- J. P. Desai, **Y. Chitalia**, S. Jeong, J. J. Chern, "Steerable and flexible robotic endoscopic tools for minimally invasive procedures," **PCT Patent, PCT/US20/20942, patent pending**, 2020
- J. P. Desai, **Y. Chitalia**, S. Jeong, J. J. Chern, "Multi-port, steerable, and flexible robotic endoscopic tools for minimally invasive procedures," **U.S. Patent Application No. 62/813,444, patent pending**, 2019
- J. P. Desai, **Y. Chitalia** "Systems and Methods for Steering Guidewires," **PCT Patent, PCT/US2018/021784, patent pending**, 2019
- J. P. Desai, **Y. Chitalia** "System, Method, and Apparatus for Active Control of Multiple Degrees-of-Freedom Micro-Scale Guidewires and Devices," **U.S. Patent Application No. 62/469,570, patent pending**, 2017