Abhijeet Agnihotri

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Interested in researching human understanding of robots and creating interactive technology to bridge the gap between these two worlds.

Education

June 2019	**Oregon State University**. MS in Robotics. Advisor: Dr. Heather Knight
May 2017	**Indian Institute of Technology Patna**. B. Tech in Mechanical Engineering. Advisor: Dr. Atul Thakur
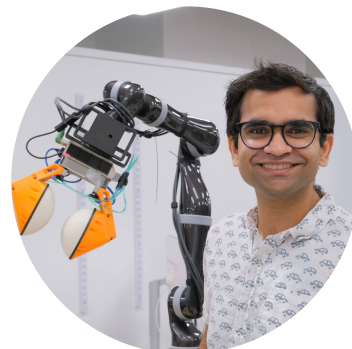
Employment

Jan 2020 - Present	**Toyota Research Institute**, UX Developer, Cambridge, MA, USA. How can robots be made successful in homes? It requires researching both robots and humans, and perhaps some tinkering around to find what works: my work is exactly that and more within the robotics user experience and industrial design team. I create prototypes and explore human-robot interaction while working closely with other technical robotics subteams and collaborators. One of my active public projects is 'Punyo,' where we are trying to make a soft robot just like Baymax!

Research Interests

Human **R**obot **I**nteraction, Design of Social Robots & Robot Personality

Developing Personalized & Interactive Autonomous Systems

Publications + Patents

1. **Abhijeet Agnihotri**, Naveen K., Alex Alspach, Kate Tsui. "**Input devices having a deformable membrane and methods of using the same**", *US Patent*. July 2022.

2. **Abhijeet Agnihotri**, Kate Tsui. "**How Does the General Population Understand Robot State?**", *in proceedings of the 16th ACM/IEEE International Conference on Human-Robot-Interaction (HRI): Late-Breaking Reports*, Boulder, USA. March 2021.

3. **Abhijeet Agnihotri**, Matthew O'Kelly, Houssam Abbas, Rahul Mangharam. "**Building Responsible Autonomous Systems at 1/10th-scale: A project based course and community**", *in proceedings of the 51st ACM Technical Symposium on Computer Science Education (SIGCSE)*, Portland, USA. March 2020.
 Best paper runner-up

4. **Abhijeet Agnihotri**, Amy Chan, Samarendra Hedaoo, Heather Knight. "**Distinguishing Robot Personality from Motion**", *in proceedings of the 15th ACM/IEEE International Conference on Human-Robot-Interaction (HRI): Late-Breaking Reports*, Cambridge, UK. March 2020.

5. **Abhijeet Agnihotri**, Heather Knight. "**Persuasive ChairBots: A (Mostly) Robot-Recruited Experiment**", *in proceedings of the 28th IEEE International Conference on Robot & Human Interactive Communication (ROMAN)*, New Delhi, India. October 2019.

6. **Abhijeet Agnihotri**, Heather Knight. "**Persuasive chairbots: A Robot Recruited Experiment**", *in proceedings of HRI Pioneers workshop at the 14th ACM/IEEE Conference on Human-Robot Interaction (HRI)*, Daegu, S.Korea. March 2019.

7. **Abhijeet Agnihotri**, Alison Shutterly, Abrar Fallatah, Brian Layng, Heather Knight. "**ChairBot Café: Personality-Based Expressive Motion**", *in Social Robots in the Wild workshop at the 13th ACM/IEEE International Conference on Human-Robot Interaction (HRI)*, Chicago, USA. March 2018.

8. Krishna Agrawal, Kushagra Jain, Dhawal Gupta, Raunak Srivastav, **Abhijeet Agnihotri**, Atul Thakur. "**Bayesian optimization based terrestrial gait tuning for an 12-dof alligator-inspired robot with active body undulation**", *in proceedings of the 42nd ASME Mechanisms and Robotics Conference*, Quebec City, Canada. August 2018.

Research Internships

Summer 2019 **Toyota Research Institute**, Robotics Researcher Intern, Cambridge, MA, USA.
Robotics: Researched communication of robot state information in functional robots via social channels: formulated the **SLiM expressions** that could be deployed on different kinds of robots.

Summer 2018 **GoogleX**, UX Researcher Intern, Mountain View, CA, USA.
Robotics: Worked at **Everyday Robots** project, aimed at creating the future of personal robots that can learn over time. Primarily, I developed software and designed robotic applications, worked on robot manipulation, and designed human-robot-interaction experiments.

Summer 2016 **Stanford University**, Interaction Design Lab, CA, USA.
Advisor: *Dr. Wendy Ju*
Interactive Social Robots: Implemented autonomous and human-in-the-loop control of multiple robotic chairs and lamps. Also analyzed expressivity of robot motor sounds that led to a publication.

Summer 2015 **New York University**, Mechatronics and Control Lab, NY, USA.
Advisor: *Dr. Vikram Kapila*
Interactive Robotic Manipulator: Built a 3D vision-based feedback control system to recognize and localize objects in the environment, that enabled contextual selection of appropriate objects.

Teaching Experience

Spring 2019 **TA**, Autonomous Driving (*f1tenth.org*), Oregon State University.
Winter 2019 **TA**, Autonomous Driving (*f1tenth.org*), Oregon State University.
Winter 2018 **TA**, Web Design, Oregon State University.
Winter 2018 **TA**, Defense Against the Dark Arts, Oregon State University.

Technical Skills

Design	Adobe creative suite, Solidworks, AutoCAD, Catia, ADAMS
Robotics/ML	ROS and Gazebo, Drake, OpenCV, Pytorch, Tensorflow
Programming	Python, C/C++, JS-CSS-HTML, Nodejs, Java, WebGL, Matlab, LATEX, Linux, Windows
Manufacturing	Rapid Prototyping, Laser Cutting, Additive Manufacturing, Wood and Metal-works

Past Projects

Sept 2018 - **Oregon State University**, *CHARISMA* Robotics Lab, OR, USA.
April 2019 Advisor: *Dr. Heather Knight*
Social Robotics: contextualized personalization system for service robots through perception-based context sensing and history based customization. Developed control software for robot teleoperation, sensing, autonomous navigation & developed machine learning algorithms for motion generation and robot behaviors.

Sept 2017 - **Oregon State University**, *CHARISMA* Robotics Lab, OR, USA.
June 2018 Advisor: *Dr. Heather Knight*
Social Robotics: designed robot personality via expressive motion behaviors in non-anthropomorphic robotic chairs: Chairbots. Conducted user studies to research persuasive strategies in ChairBots.

July 2015 - **Indian Institute of Technology Patna**, MICL Lab, India.
May 2017 Advisor: *Dr. Atul Thakur*
Bachelor Thesis project: Simulated, fabricated and developed autonomous control for a 12-DOF alligator inspired robot maneuverable on uneven terrains. Vision-based robust motion planning, on-board simultaneous localization, mapping and decision making. Analyzed its speed and energy to discover the importance of body undulations and tail movement, led to a research publication.

July 2016 - Dec 2016	**Indian Institute of Technology Patna**.
	Smart Home Control: Designed a system that interfaced with home sensors and actuators via a mobile app interface. The system incorporated smart tech like facial recognition, security monitoring, and learned user preferences.

Honours and Awards

Second Best Paper SIGCSE 2020. Our paper on creating a project based curriculum to teach robotics via a one-tenth sized race car received a best paper award at the prestigious SIGCSE conference.

HRI-Pioneer 2019. Awarded funding support to attend Human-Robot-Interaction (HRI) Pioneers workshop, a selective workshop that seeks to foster creativity and collaboration across the disciplines of HRI researchers.

Outstanding Undergraduate Thesis Award. Given for the best undergraduate thesis from the graduating class of 2017, Mechanical engineering - IIT Patna.

Runner-up at the *5th IEEE International Symposium on Embedded computing and system Design(ISED)* **Grand Innovation Challenge**. 2016.

Awarded the prestigious **Kishore Vaigyanik Protsahan Yojana** Scholarship, awarded by *D.S.T., Govt. of India* to top 200 science students in India. 2012.

Awarded the prestigious **INSPIRE** Scholarship by *D.S.T., Govt. of India* as one of the top 100 science students in Rajasthan, India. 2012.

Professional Services

Accessibility Chair	**HRI**, 2021, International conference on Human Robot Interaction.
Reviewer	**HRI**, 2018-present, International conference on Human Robot Interaction.
	RoMan, 2018-present, International Symposium on Robot and Human Interactive Communication.
	ICRA, 2022, International Conference on Robots and Automation.
	CHI, 2021, Conference on Human Factors in Computing Systems.
	ITSC, 2020, International Conference on Intelligent Transportation Systems.