

**Current Position** **Research Scientist and Manager, Meta Reality Labs, USA** Fall 2018 – Present  
Embodied AI for human-assistive agents.

**Research Interests** Embodied AI, Vision and Language, Human Robot and Human Computer Interaction.

**Education** **Carnegie Mellon University, USA** 2013 - 2018  
Ph.D. in Robotics (GPA: 3.80/4.0) Advisors: Stelian Coros and Jim McCann  
Thesis: [Robot design for everyone– Computational tools that democratize robot design](#)

**Carnegie Mellon University, USA** 2011 - 2012  
Master of Science in Robotics (GPA: 3.83/4.0) Advisors: Hartmut Geyer and Chris Atkeson

**National Institute of Technology (NIT) Surat, India** 2007 - 2011  
Bachelor of Technology in Electronics Engineering (GPA: 9.26/10)

**Research Experience** **Carnegie Mellon University, Pittsburgh, USA** Graduate Research Assistant  
Advisors: Stelian Coros and Jim McCann Fall 2015 – Fall 2018  
Human-AI systems that enable casual users to design and build robots.

**Autodesk Research, Toronto, Canada** Research Intern  
Advisors: Fraser Anderson, Justin Matejka, and Tovi Grossman Summer 2017  
Data-driven, semantic, human-AI system for creating expressive robot behaviors.

**Carnegie Mellon University, Pittsburgh, USA** Graduate Research Assistant  
Advisors: Jessica Hodgins and Hartmut Geyer Fall 2013 – Spring 2015  
Bipedal lateral balance controller for flat and uneven surfaces like seesaw.

**Disney Research, Pittsburgh, USA** Research Intern  
Advisor: Jessica Hodgins Spring 2013  
Human motor skill acquisition and adaptation research using motion capture data.

**Carnegie Mellon University, Pittsburgh, USA** Graduate Research Assistant  
Advisors: Hartmut Geyer and Chris Atkeson 2011 – 2012  
Neural hypothesis of human leg placement during gait and its extension for prosthetic control.

**Technische Universitat Ilmenau, Germany** Research Intern  
Advisor: Horst Michael Gross Summer 2010  
Camera pose estimation approaches for effective 3D structure reconstruction.

**Indian Institute of Science (IISc.), Bangalore, India** Research Intern  
Advisor: Debasish Ghose Summer 2009  
Swarm optimization approaches for in-house swarm robots to enable search and localization.

**Publications** T. Nagarajan, Sk Ramakrishnan, **R. Desai**, J. Hillis, and K. Grauman, “Egocentric Scene Context for Human-centric Environment Understanding from Video”, The Conference on Computer Vision and Pattern Recognition (CVPR), 2023 [In preparation][[arXiv](#)].  
[Google Scholar](#)

W. Mao, **R. Desai**, M. Iuzzolino, and N. Kamra, “Action Dynamics Task Graphs for Learning Plannable Representations of Procedural Tasks”, Thirty-Seventh AAAI Conference on Artificial Intelligence (AAAI) Workshop, 2023 [In preparation].

S. Datta, S. Dharur, V. Cartillier, **R. Desai**, M. Khanna, D. Batra, and D. Parikh, “Episodic Memory Question Answering”, The Conference on Computer Vision and Pattern Recognition (CVPR), 2022 [[PDF](#)].

- K. Pertsch, **R. Desai**, F. Meier, V. Kumar, D. Batra, and A. Rai, “Cross-Domain Imitation Learning via Semantic Skills”, Conference on Robot Learning (CoRL), 2022 [Accepted].
- D. Yu, **R. Desai**, T. Zhang, H. Benko, T. Jonker, and A. Gupta, “Optimizing the Timing of Intelligent Suggestion in Virtual Reality”, ACM User Interface Software and Technology Symposium (UIST), 2022 [Accepted].
- S. Tsutsui, **R. Desai**, and K. Ridgeway, “Self-supervised Representation Learning with Egocentric Video and Head-mounted IMU”, EPIC workshop at International Conference on Computer Vision (ICCV), 2021 [PDF].
- B. Newman, K. Carlberg, and **R. Desai**, “Optimal Assistance for Object-Rearrangement Tasks in Augmented Reality”, Preprint, 2020 [arXiv].
- N. Medathati, **R. Desai**, and J. Hillis, “Towards inferring cognitive state changes from pupil size variations in real world”, ACM Symposium on Eye Tracking Research and Applications (ETRA), 2020 [PDF].
- R. Desai**, F. Anderson, J. Matejka, S. Coros, J. McCann, G. Fitzmaurice and T. Grossman, “Geppetto: Enabling Semantic Design of Expressive Robot Behaviours”, ACM Conference on Human Factors in Computing Systems (CHI), 2019 [PDF]. *Best Paper Award*
- R. Desai**, B. Li, Y. Yuan and S. Coros, “Interactive Co-Design of Form and Function for Legged Robots using the Adjoint Method”, International Conference on Climbing and Walking Robots (CLAWAR), 2018 [arXiv]. *Best Paper Award*
- R. Desai**, J. McCann and S. Coros, “Assembly-aware Design of Printable Electromechanical Devices”, ACM User Interface Software and Technology Symposium (UIST), 2018 [PDF].
- M. Geilinger, R. Poranne, **R. Desai**, B. Thomaszewski and S. Coros, “Skaterbots: Optimization-based Design and Motion Synthesis for Robotic Creatures with Legs and Wheels”, ACM Transaction on Graphics (ACM SIGGRAPH), 2018 [PDF].
- R. Desai**, M. Safonova, K. Muelling and S. Coros, “Automatic Design of Task-specific Robotic Arms”, Workshop on Autonomous Robot Design, ICRA, 2018 [PDF].
- R. Desai**, Y. Yuan and S. Coros, “Computational Abstractions for Interactive Design of Robotic Devices”, IEEE International Conference on Robotics and Automation (ICRA), 2017 [PDF].
- M. Vasquez, E. Brockmeyer, **R. Desai**, S.E. Hudson and C. Harrison, “3D Printing Pneumatic Device Controls with Variable Activation Force Capabilities”, ACM Conference on Human Factors in Computing Systems (CHI), 2015 [PDF].
- R. Desai**, J. K. Hodgins, “A Simple Model of Skill Acquisition in a Dynamic Balance Task”, Dynamic Walking, 2015 [PDF].
- R. Desai**, H. Geyer and J. K. Hodgins, “Virtual Model Control for Dynamic Lateral Balance”, IEEE International Conference on Humanoid Robots (Humanoids), 2014 [PDF].
- R. Desai**, H. Geyer, “Muscle-Reflex Control of Robust Swing Leg Placement”, IEEE International Conference on Robotics and Automation (ICRA), 2013 [PDF].
- S. Song, **R. Desai**, and H. Geyer, “Integration of an Adaptive Swing Control into a Neuromuscular Human Walking Model”, 35th Annual International Conference of IEEE Engineering in Medicine and Biology Society (EMBS), 2013 [PDF].
- R. Desai**, H. Geyer, “Robust Swing Leg Placement under Large Disturbances”, IEEE International Conference on Robotics and Biomimetics, 2012 [PDF].

<b>Patents</b>	<p>B. Newman, K. Carlberg, <b>R. Desai</b>, J. Hillis, “Optimal Assistance for Object-Rearrangement Tasks in Augmented Reality”, US Patent No. US-2022-0114366-A1, 2022 [<a href="#">link</a>].</p> <p>F. Anderson, S. Coros, <b>R. Desai</b>, T. Grossman, J.F. Matejka, G. Fitzmaurice “Generative design techniques for robot behavior”, US Patent No. US-2020-0034514-A1, 2020 [<a href="#">link</a>].</p> <p><b>R. Desai</b>, H. Geyer, “Robust Swing Leg Controller under Large Disturbances”, US Patent No. US-2015-0066156-A1, 2014 [<a href="#">link</a>].</p>
<b>Honors and Awards</b>	<p>Best Paper Award, ACM CHI Conference (2019)</p> <p>Best Paper Award, CLAWAR Conference (2018)</p> <p>Dr. Kanako Muira Award for Women Researchers, IEEE Humanoids Conference (2014)</p> <p>Siebel Scholarship, Outstanding CS students in CMU (2013)</p> <p>Google Anita Borg Memorial Scholarship (2012)</p> <p>German Academic Exchange Service (DAAD) WISE Scholarship (2010)</p> <p>Indian National Association of Engineers (INAE) Fellowship (2010)</p> <p>Dhirubhai Ambani Foundation (DAF) Undergraduate Scholarship (2006 - 2010)</p>
<b>Academic Service</b>	<p><b>Conference Committee</b></p> <p>ACM CHI Conference Associate Chair (2021, 2020)</p> <p>ACM UIST Conference Program Committee (2020, 2019)</p> <p><b>Reviewer</b></p> <p>IEEE IROS, IEEE ICRA, ACM GI, ACM UIST, ACM CHI, IEEE WHC, ACM TEI (2015 - 2022)</p> <p><b>Teaching and Admissions</b></p> <p>CMU RI Summer Scholar (Undergraduate Researchers) Selection Committee (2017)</p> <p>Teaching Assistant for Biomechanics and Human Motor Control Graduate Course (2014)</p>
<b>Invited Talks</b>	<p>Guest Lecture in <a href="#">Generating Expressiveness in Intelligent Agents and Avatars</a>, University of Florida (2022)</p> <p><a href="#">DUB Seminar</a>, University of Washington (2020)</p> <p><a href="#">BID Seminar</a>, University of California, Berkeley (2019)</p> <p><a href="#">GRASP Seminar</a>, University of Pennsylvania (2019)</p>
<b>Mentoring</b>	<p><b>Intern Manager at Meta</b></p> <p>Rishi Hazra, PhD student at Orebo University, Sweden (Fall 2022)</p> <p>Dhruvesh Patel, PhD student at UMass Amherst (Summer 2022)</p> <p>Andrew Szot, PhD student at Georgia Tech, co-mentor with Akshara Rai (Summer 2022)</p> <p>Paul Schydlo, PhD student at Carnegie Mellon University (Fall 2021).</p> <p>Satoshi Tsutsui, PhD student at Indiana University (Spring 2021).</p> <p>Ben Newman, PhD student at Carnegie Mellon University (Fall 2019).</p> <p><b>Intern Advisor at Carnegie Mellon University (CMU)</b></p> <p>Beichen Li, Tshingua University (Summer 2017), later PhD at MIT EECS.</p> <p>Shuangning Liu, Tshingua University (Summer 2016), later MS at CMU.</p>
<b>Outreach Activities</b>	<p><b>Volunteer, <a href="#">Women@SCS</a></b> 2012-2016</p> <p>Volunteering in Technights and Roadshows for school outreach at Carnegie Mellon.</p> <p><b>Organizing Committee, <a href="#">OurCS</a></b> 2015</p> <p>Organizing a 3-day workshop for undergraduate women to encourage them in research with Women@SCS.</p> <p><b>Founding member, <a href="#">CMU Laptop Rehab</a></b> 2014-2015</p> <p>Started a student organization which refurbishes old computers and donates them to schools in Pittsburgh and India.</p>

**Planning committee, Google Anita Borg Scholarship Alumni Community** 2014-2015  
Reaching out organizations working for Women in Tech and organizing activities to encourage girls in computer science.

**Seminar committee, Robotics Institute** 2013-2015  
Publicizing department seminar. Co-organizing a student-run meta seminar series.

**Charity Chair, Indian Graduate Student Association (IGSA)** 2013-2014  
Initiating community service activities for Indian graduate students at Carnegie Mellon.

**Selected  
Press**

**Techcrunch**, New toolkit makes it easy to drag and drop your own robot (2017).

**ACM Communications**, Robot Design For Dummies (2017).

**EurekaAlert**, CMU's interactive tool helps novices and experts make custom robots (2017).

**NSF ERC**, Graduate Student Earns Prestigious Scholarships for Women - Ruta Desai (2012).

**CMU SCS**, Five SCS Students Named Siebel Scholars (2012).

**Skills**

*Programming Languages:* C++, Python, C, Embedded Microcontroller programming, HTML.

*Platforms and Tools:* Pytorch, Tensorflow, Matlab, Simulink, Mathematica, Visual Studio, Solidworks, OpenSCAD, Blender, Photoshop, Premiere.

*HCI and Prototyping:* User studies, Surveys, Interviews, Crowdsourcing, Arduino, 3D printing.