

Sudharshan Suresh

PERSONAL	www.cs.cmu.edu/~sudhars1 / suddhu@cmu.edu / linkedin / scholar / github	
RESEARCH AREA	Robot manipulation SLAM Learning for perception Touch sensing	
EDUCATION	Robotics Institute, Carnegie Mellon University Ph.D. in Robotics Advisor: Prof. Michael Kaess Thesis: Perception amidst interaction - spatial AI with vision and touch for manipulation	2019 - Jan 2024 [expected]
	Robotics Institute, Carnegie Mellon University M.S. in Robotics GPA: 4.09, Advisor: Prof. Michael Kaess Thesis: Localization and Active Exploration in Indoor Underwater Environments	2017 - 2019
	National Institute of Technology, Trichy, India B.Tech (Honors) in Instrumentation and Control Engineering GPA: 9.45/10	2013 - 2017
EXPERIENCE	Part-time researcher, FAIR (Meta) Pittsburgh Research scientist intern, FAIR (Meta) Menlo Park AI research intern, FAIR (Meta) Pittsburgh Graduate research assistant, Robot perception lab, CMU Research intern, Planetary robotics lab, CMU Research intern, Video analytics lab, IISc Bangalore	2022 - present Summer 2023 Summer 2022 2018 - present Summer 2016 Summer 2015
PUBLICATIONS		
IN SUBMISSION	[1] S. Suresh , H. Qi, T. Wu, T. Fan, L. Pineda, M. Lambeta, J. Malik, M. Kalakrishnan, R. Calandra, M. Kaess, J. Ortiz, and M. Mukadam, "Neural feels with neural fields: Visuo-tactile perception for in-hand manipulation," In submission, Nov 2023 website	
PEER-REVIEWED PUBLICATIONS	[2] H. Qi, B. Yi, S. Suresh , M. Lambeta, Y. Ma, R. Calandra, and J. Malik, "General In-Hand Object Rotation with Vision and Touch," In <i>Proc. Conf. on Robot Learning, CoRL</i> , Atlanta, USA, Nov 2023 paper / website [3] S. Suresh , Z. Si, S. Anderson, M. Kaess, and M. Mukadam, "MidasTouch: Monte-Carlo inference over distributions across sliding touch," In <i>Proc. Conf. on Robot Learning, CoRL</i> , Auckland, New Zealand, Dec 2022, Oral, 6.5% Acceptance Rate paper / website / code / presentation [4] S. Suresh , Z. Si, J. Mangelson, W. Yuan, and M. Kaess, "ShapeMap 3-D: Efficient shape mapping through dense touch and vision," In <i>Proc. IEEE Intl. Conf. on Robotics and Automation (ICRA)</i> , May 2022. paper / website / code / presentation [5] S. Suresh , M. Bauza, K.-T. Yu, J. Mangelson, A. Rodriguez, and M. Kaess, "Tactile SLAM: Real-time inference of shape and pose from planar pushing," In <i>Proc. IEEE Intl. Conf. on Robotics and Automation (ICRA)</i> , Xi'an, China, May 2021, Best paper award in service robotics finalist paper / website / presentation [6] M. Hsiao, J.G. Mangelson, S. Suresh , C. Debrunner, and M. Kaess, "ARAS: ambiguity-aware robust active SLAM based on multi-hypothesis state and map estimations," In <i>Proc. IEEE/RSJ Intl. Conf. on Intelligent Robots and Systems (IROS)</i> , Oct. 2020. paper [7] S. Suresh , P. Sodhi, J. G. Mangelson, D. Wettergreen, and M. Kaess, "Active SLAM using 3D submap saliency for underwater volumetric exploration," In <i>Proc. IEEE Intl. Conf. on Robotics and Automation (ICRA)</i> , Paris, France, pp. 3132-3138, May 2020. paper / presentation	

JOURNAL
PUBLICATIONS

- [8] [S. Suresh](#), E. Westman, and M. Kaess, "Through-water stereo SLAM with refraction correction for AUV localization," *IEEE Robotics and Automation Letters (RA-L)*, vol. 4, no. 2, pp. 2377-3766, presented at ICRA 2019, Apr. 2019. [paper](#) / [presentation](#)
- [9] R. K. Sarvadevabhatla, [S. Suresh](#), and R. Venkatesh Babu, "Object category understanding via eye fixations on freehand sketches," *IEEE Transactions on Image Processing*, vol. 26, no. 5, pp. 2508-2518, May 2017. [paper](#) / [website](#)

WORKSHOPS/OTHER
PUBLICATIONS

- [10] [S. Suresh](#), J. G. Mangelson, and M. Kaess, "Incremental shape and pose estimation from planar pushing using contact implicit surfaces," In *ICRA 2020 workshop - ViTac 2020: Closing the Perception-Action Loop with Vision and Tactile Sensing*, May 2020. [paper](#) / [presentation](#)
- [11] J. Hsiung, A. Tallaksen, L. Papincak, [S. Suresh](#), H. Jones, W. Whittaker, and M. Kaess, "Localized imaging and mapping for underwater fuel storage basins," In *Proceedings of the Symposium on Waste Management*, Phoenix, Arizona, Mar. 2018. [paper](#) / [presentation](#)
- [12] [S. Suresh](#), N. Chodosh, M. Abello, "DeepGeo: Photo Localization with Deep Neural Network," *arXiv preprint arXiv:1810.03077*, 2018. [paper](#) / [code](#)
- [13] E. Fang, [S. Suresh](#) and W. Whittaker, "Camera-only kinematics for small lunar rovers," In *Annual Meeting of the Lunar Exploration Analysis Group*, Columbia, Maryland, Vol. 1960, Nov 2016. [poster](#) / [paper](#) / [video](#)

INVITED TALKS

[FRC seminar](#)- Localization and active exploration in indoor underwater environments, July 2019
[Tartan SLAM series](#)- Tactile SLAM: inferring object shape and pose through touch ([video](#)), Aug. 2021
 R-PAD lab, CMU- Towards shape perception via touch and vision for manipulators, Oct. 2021
 RoboTouch lab, CMU- ShapeMap 3D: Efficient shape mapping through dense touch and vision, Oct. 2021
 FAIR embodied AI seminar- Monte-Carlo inference over distributions across sliding touch, Aug. 2022

AWARDS AND
HONORS

Best paper award in service robotics finalist, ICRA '21 [4]
[Hima and Jive Fellowship](#) in Computer Science, '20
 RECAL Alumni Award and Sri. Avinash Memorial Award, '17 (*gold-medalist in undergraduate major*)
[OPJEMS Scholar](#), '17 (*100 undergraduates across India*)
[Cargill Global Scholar](#), '15 - '17 (*10 undergraduate sophomores across India*)

SERVICE

Reviewer: IROS '20, '21, '22, '23 | ICRA '21, '22, '23 | RA-L | T-RO
Organizing committee: Debates on the Future of Robotics Research, ICRA '21, '22 (Technical chair)
Student volunteer: CoRL '23
Admissions committee: CMU MSCV '23, CMU RI Summer Scholars program ('18, '19, '20)
Mentorship: CMU AI undergraduate mentorship program ('19), NIT Trichy Jiteshraj Scholarship ('18)

TEACHING

Teaching Assistant, [16-833](#): Robot Localization and Mapping @ CMU 2019, 2020

SELECT
COURSEWORK

Graduate: Convex optimization (10-725), kinematics, dynamics and control (16-711), geometry-based methods in vision (16-822), planning and decision-making in robotics (16-782), robot localization and mapping (16-833), introduction to machine learning (10-701), computer vision (16-720), mathematical fundamentals for robotics (16-811)

Undergraduate: Data structures and algorithms, computer networks, neural networks and fuzzy logic, image processing, basics of programming, control systems, robotics, signals and systems, circuit theory, embedded systems, linear integrated circuits, sensors and transducers, material science, numerical methods