


KARNIK RAM

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 [karnikram](https://github.com/karnikram)

EDUCATION	<p>International Institute of Information Technology, Hyderabad (IIIT-H) 2018 - 2021 M.S. by Research in Computer Science & Engineering Thesis: Robust plane-based visual-inertial odometry for dynamic environments <i>Outstanding MS Thesis Award, IIIT-H</i> GPA: 9.50/10</p> <p>Anna University, SSN College of Engineering, Chennai 2013 - 2017 B.Eng. in Electronics & Communication Engineering <i>Best Thesis Project Award, ECE Dept.</i> GPA: 7.20/10</p>
PUBLICATIONS	<p>RP-VIO: Robust Plane-based Visual-Inertial Odometry for Dynamic Environments  Karnik Ram, Chaitanya Kharyal, Sudarshan S. Harithas, K. Madhava Krishna <i>International Conference on Intelligent Robots and Systems (IROS), 2021</i></p> <p>Learnable Spatio-Temporal Map Embeddings for Deep Inertial Localization  Dennis Melamed, Karnik Ram, Vivek Roy, Kris Kitani <i>International Conference on Intelligent Robots and Systems (IROS), 2022</i></p> <p>CalibNet: Geometrically-Supervised LiDAR-Camera Extrinsic Calibration using 3D Spatial Transformer Networks  Ganesh Iyer, Karnik Ram, J. Krishna Murthy, K. Madhava Krishna <i>International Conference on Intelligent Robots and Systems (IROS), 2018</i></p> <p>INFER: Intermediate Representations for Future Prediction  Shashank Srikanth, Junaaid Ahmed Ansari, Karnik Ram, Sarthak Sharma, J. Krishna Murthy, K. Madhava Krishna <i>International Conference on Intelligent Robots and Systems (IROS), 2019</i></p> <p>PathFinder: Designing a Map-less Navigation Robot for Blind People in Unfamiliar Buildings  Masaki Kuribayashi, Tatsuya Ishihara, Daisuke Sato, Jayakorn Vongkulbhisal, Karnik Ram, Seita Kayukawa, Hironobu Takagi, Shigeo Morishima, Chieko Asakawa <i>CHI Conference on Human Factors in Computing Systems, 2023</i></p> <p>Tackling Gradient Variance in Differentiable Bundle Adjustment Layers Swaminathan Gurumurthy, Karnik Ram, Bingqing Chen, Zachary Manchester, J Zico Kolter <i>In submission</i></p>
WORK EXPERIENCE	<p>Carnegie Mellon University Oct 2022 - Aug 2023 <i>Research Associate, Robotics Institute</i> Advisor: Prof. Srinivasa Narasimhan</p> <ul style="list-style-type: none">- Worked with programmable light curtains (PLC), a novel controllable depth sensor. - Worked on using PLC for building a safety monitoring system, and for active robot perception. <p>Carnegie Mellon University Aug 2021 - Oct 2022 <i>Research Associate, Robotics Institute</i> Advisor: Prof. Kris Kitani</p> <ul style="list-style-type: none">- Worked on a low-drift inertial odometry algorithm using map prior information (IROS '22).- Implemented a camera-less localization algorithm on a smartphone for indoor navigation.- Worked on a map-less navigation robot for assisting the visually impaired (CHI '23).

	International Institute of Information Technology, Hyderabad <i>Graduate Research Student, Robotics Research Center</i> Advisor: Prof. K. Madhava Krishna - Developed a plane-based monocular visual-inertial odometry algorithm and a dataset for dynamic environments (IROS '21). - Worked on trajectory prediction using intermediate semantic representations (IROS '19).	Aug 2018 - Aug 2021
	Google Summer of Code ☞ <i>Student Developer, Mobile Robot Programming Toolkit</i> - Developed a self-contained GUI app for the extrinsic calibration of depth sensors. - Implemented extrinsic calibration algorithms based on plane and line matching.	Summer 2018
	International Institute of Information Technology, Hyderabad <i>Research Intern, Robotics Research Center</i> Advisor: Prof. K. Madhava Krishna, J. Krishna Murthy - Worked on a deep network with geometric supervision for target-less LiDAR-camera extrinsic calibration (IROS '18). - Implemented a target-based LiDAR-camera extrinsic calibration algorithm.	May 2017 - April 2018
SYSTEMS PROJECTS	Smartphone-based Indoor Navigation - Implemented a real-time deep IMU and BLE based localization system on a smartphone. Janitorial Mobile Robot - Implemented indoor navigation on a mobile robot for pick-and-place janitorial tasks. Automated Stock-counting Quadcopter - Implemented on-board navigation on a custom-built drone using optical-flow based odometry.	
AWARDS	- Ritesh Tiwari Outstanding MS Thesis Award , IIIT Hyderabad ☞ 2021 - Best Senior Year Project Award , ECE Department, SSN-CE 2017 - Top 3 out of 136 teams in the ARTPARK Robotics Challenge, IISc ☞ 2022 - First place , inter-college image processing based robotics event, Anna University 2016 - Top 10 out of 144 teams in the “Apps for Chennai Challenge” 2015	
RELEVANT COURSEWORK	<i>Graduate:</i> Mobile Robotics, Computer Vision, Machine Learning, Topics in Applied Optimization. <i>Undergraduate:</i> Robotics & Automation, Digital Image Processing, OOP & Data Structures, Computer Architecture, Probability & Random Processes, Embedded & Real Time Systems	
ADDITIONAL COURSES	ETH Robotics Summer School , ETH Zürich ☞ July 2019 2-week summer school on autonomous ground robot navigation with talks, hands-on lectures and exercises, and a competition. 53 selected participants from 15 countries. Awarded full travel grant. Committee: Cesar Cadena, Marco Hutter	
TEACHING EXPERIENCE	CSE 483 Mobile Robotics ☞ Fall 2019 <i>International Institute of Information Technology, Hyderabad</i> Designed five new assignments and exams along with regular responsibilities as head teaching assistant with Prof. K. Madhava Krishna. 3D Computer Vision Workshop ☞ Feb 2020 <i>International Institute of Information Technology, Hyderabad</i> Instructor for the multiple view geometry hands-on session for a large professional audience.	
SERVICES	- Served as a reviewer in the SLAM track for IROS 2021, 2022 - Served as a co-chair for the VI-SLAM session at IROS 2021 - Lab systems administrator for the compute cluster at RRC, IIIT Hyderabad 2020-21 - Conceived, developed, and maintained The SSN App , the official Android app of SSN-CE 2014-17	