

# KARNIK RAM

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EDUCATION	<b>International Institute of Information Technology, Hyderabad</b> 2018 - 2021 M.S. by Research in Computer Science & Engineering Thesis: Robust plane-based visual-inertial odometry for dynamic environments GPA: 9.50/10
	<b>Anna University, SSN College of Engineering, Chennai</b> 2013 - 2017 B.Eng. in Electronics & Communication Engineering GPA: 7.2/10
PUBLICATIONS	<b>RP-VIO: Robust Plane-based Visual-Inertial Odometry for Dynamic Environments</b> 📄 <b>Karnik Ram</b> , Chaitanya Kharyal, Sudarshan S. Harithas, K. Madhava Krishna <i>International Conference on Intelligent Robots and Systems (IROS), 2021</i>
	<b>Learnable Spatio-Temporal Map Embeddings for Deep Inertial Localization</b> Dennis Melamed, <b>Karnik Ram</b> , Vivek Roy, Kris Kitani <i>International Conference on Intelligent Robots and Systems (IROS), 2022</i>
	<b>CalibNet: Geometrically-Supervised LiDAR-Camera Extrinsic Calibration using 3D Spatial Transformer Networks</b> 📄 Ganesh Iyer, <b>Karnik Ram</b> , J. Krishna Murthy, K. Madhava Krishna <i>International Conference on Intelligent Robots and Systems (IROS), 2018</i>
	<b>INFER: Intermediate Representations for Future Prediction</b> 📄 Shashank Srikanth, Junaaid Ahmed Ansari, <b>Karnik Ram</b> , Sarthak Sharma, J. Krishna Murthy, K. Madhava Krishna <i>International Conference on Intelligent Robots and Systems (IROS), 2019</i>
	<b>PathFinder: Designing a Map-less Navigation Robot for Blind People in Unfamiliar Buildings</b> Masaki Kuribayashi, Tatsuya Ishihara, Daisuke Sato, Jayakorn Vongkulbhisal, <b>Karnik Ram</b> , Seita Kayukawa, Hironobu Takagi, Shigeo Morishima, Chieko Asakawa <i>CHI Conference on Human Factors in Computing Systems, 2023 (Under review)</i>
WORK EXPERIENCE	<b>Carnegie Mellon University</b> Oct 2022 - Present <i>Research Associate, Robotics Institute</i> Advisor: Prof. Srinivasa Narasimhan <ul style="list-style-type: none"><li>- Working with programmable light curtains (PLC), a novel controllable depth sensor.</li><li>- Working on using PLC for active robot perception, and for generating flexible safety envelopes.</li></ul>
	<b>Carnegie Mellon University</b> Aug 2021 - Oct 2022 <i>Research Associate, Robotics Institute</i> Advisor: Prof. Kris Kitani <ul style="list-style-type: none"><li>- Worked on a low-drift inertial odometry algorithm using map prior information (IROS 22).</li><li>- Implemented a camera-less localization algorithm on a smartphone for indoor navigation.</li><li>- Worked on a map-less navigation robot for assisting the visually impaired.</li></ul>
	<b>International Institute of Information Technology, Hyderabad</b> Aug 2018 - Aug 2021 Advisor: Prof. K. Madhava Krishna <i>Graduate Research Student, Robotics Research Center</i> <ul style="list-style-type: none"><li>- Developed a plane-based monocular visual-inertial odometry algorithm and a dataset for dynamic environments (IROS 21).</li><li>- Worked on trajectory prediction using intermediate semantic representations (IROS 19).</li></ul>

## Google Summer of Code

*Student Developer, Mobile Robot Programming Toolkit*

Summer 2018

- Developed a GUI app for the extrinsic calibration of depth sensors.
- Implemented calibration algorithms based on plane and line matching.

## International Institute of Information Technology, Hyderabad

*Research Intern, Robotics Research Center*

May 2017 - April 2018

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.

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	<b>ETH Robotics Summer School</b> , ETH Zürich ☞ July 2019 2-week summer school on autonomous ground robot navigation with talks, hands-on lectures and exercises, and a competition. Committee: Cesar Cadena, Marco Hutter
TEACHING EXPERIENCE	<b>CSE 483 Mobile Robotics</b> ☞ 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  <b>3D Computer Vision Workshop</b> Feb 2020 <i>International Institute of Information Technology, Hyderabad</i> Instructor for the multiple view geometry tutorial session for a large professional audience.
AWARDS	<ul style="list-style-type: none"><li>- <b>Top 2</b> out of 134 teams in the ARTPARK Robotics Challenge, IISc 2021</li><li>- <b>Best Senior Year Project</b>, ECE Department, SSN-CE 2017</li><li>- <b>First place</b>, inter-college image processing based robotics event, Anna University 2016</li><li>- <b>Top 10</b> out of 144 teams in the “Apps for Chennai Challenge” 2015</li></ul>
SERVICES	<ul style="list-style-type: none"><li>- <b>Lab Systems Administrator</b> for the compute cluster at RRC, IIIT Hyderabad. 2020-21</li><li>- Served as a reviewer in the SLAM track for IROS. 2021, 22</li><li>- Served as a co-chair for the VI-SLAM session at IROS. 2021</li><li>- Conceived, developed, and maintained <b>The SSN App</b>, the official Android app of SSN-CE. 2014-17</li></ul>
TECHNICAL SKILLS	<i>Tools &amp; Libraries:</i> OpenCV, ROS, PyTorch, Ceres Solver, Eigen, Git   Familiar: iOS, Qt, Android <i>Programming Languages:</i> C++, Python   Familiar: Swift, Java