Junaid Ahmed Ansari

Research Scholar at Robotics Research Center
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⌨ [GitHub]

Education

2016–Now **MS by Research in Computer Science and Engineering**, *Robotics Research Center, KCIS, International Institute of Information Technology Hyderabad (IIIT Hyderabad)*, India, **CGPA - 9.33/10.0**.
Courses: Robotic Vision, Computer Vision, Intro. to Robotics, Intro. to Parallel Scientific Computing, Advances in Robotics and Control

2007–2011 **Bachelor of Engineering in Computer Science and Engineering**, *Sri Venkateshwara College of Engineering*, Bangalore, India, **Percentage - 68%**.
Important courses: Engineering Mathematics, Discrete Mathematics, Object Oriented Programming, Operating Systems, Database Systems, Microprocessors, Computer Networks, Computer Organization, Software Architecture, Algorithm Design and Analysis, Data Structures, C++, C#, Java

Publications

2019 (Submitted) **INFER: INtermediate representations for distant FuturE pRediction**, *IROS 2019.*, Shashank S, Junaid Ahmed Ansari, Karnik Ram, Sarthak Sharma, J Krishna Murthy, K Madhava Krishna, **[Pre-print]**.

2018 (Conf.) **The Earth ain't Flat: Monocular reconstruction of Vehicles on Steep and Graded Roads from a Moving Camera**, *IEEE Conference on Intelligent Robots and Systems (IROS)*, Junaid Ahmed Ansari, Sarthak Sharma, Anshuman Majumdar, J Krishna Murthy, K Madhava Krishna, **[arXiv][Video]**.

2018 (Conf.) **Beyond Pixels: Leveraging Geometry and Shape Cues for Online Multi-Object tracking**, *IEEE Conference on Robotics and Automation (ICRA)*, Sarthak Sharma, Junaid Ahmed Ansari, J Krishna Murthy, K Madhava Krishna, **[arXiv][video][code][Leaderboard]** (Then 1st place).

2016(Journal) **An Open Voice Command Interface Kit**, *IEEE Transactions on Human-Machine Systems*, Junaid Ahmed Ansari, Arasi Sathyamurthi, Ramesh Balasubramanyam, **[paper][code]**.

2012 (Poster) **VACU - Voice Activated Control Unit**, *Poster in Indo-German workshop on Neurobionics in clinical Neurology*.

Work Experience

2013–2015 (2-years) **Temporary Project Assistant** , *Raman Research Insitute (RRI), Bangalore, India*, Worked with Prof. Ramesh Balasubramanyam.

Monsoon 2018 **Teaching Assistant**, *CSE483 Mobile Robotics (Perception/Robotics)*, (Prof. K. Madhava Krishna) IIIT Hyderabad, India.

Research Experience

2016–Now **Research Assistant**, *Robotics Research Center, KCIS, IIIT Hyderabad, India*, Working on multi-body SLAM and monocular reconstruction and pose estimation of vehicles in dynamic traffic scenes. Worked on monocular multi-object tracking.

2016 **Research Intern**, *Robotics Research Center, KCIS, IIIT Hyderabad*, Developed a ROS (C++) package for detecting all possible safe and feasible frontiers for a mobile robot to explore using stereo vision.

2015–2016 **Research Intern**, *Raman Research Insitute, Bangalore*, Worked with Prof. Ramesh Balasubramanyam in the areas of machine vision, robotics and control..

2013–2015 (2-years) **Project Assistant**, *Raman Research Insitute, Bangalore, India*, Worked on variety of projects related to Voice Activated Wheelchair project with Prof. Ramesh Balasubramanyam and Prof. Hema Ramachandran; these include visual odometry, wheelchair control, voice recognition and software framework design and development.

2011–2012 **Research Intern**, *Raman Research Insitute, Bangalore*, Worked with Prof. Ramesh Balasubramanyam in the areas of machine vision, robotics and control..

Selected Research/System Projects

2018 – Current   **Multi-body SLAM in an unified and metric scale**, *Robotics Research Center, IIIT Hyderabad. In this work we intend to solve the full multi-body SLAM problem in an unified and metric scale. This work lies in the intersection of machine learning and classical approaches such as Bundle Adjustment and multi-pose-graph optimization.*.

2018 – 2019   **INFER: INtermediate representations for FuturE pRediction**, *Robotics Research Center, IIIT Hyderabad. In this work we propose an adequate representation for an end to end future trajectory prediction of other traffic participants. We show that the network once trained on a particular dataset using the proposed representation can transfer zero-shot to other datasets.*.

2017 – 2018   **Real-time monocular object SLAM system for dynamic road scenes**, *Robotics Research Center, IIIT Hyderabad. Funded by **Qualcomm Innovation Fellowship** (QInF), 2017, Qualcomm, India. Worked on monocular reconstruction of dynamic (and static) vehicles and localizing them in global frame in metric scale by recovering the scale.*.

2017 – 2018   **Monocular Multi-object Tracking**, *Robotics Research Center, IIIT Hyderabad. Funded by **Qualcomm Innovation Fellowship** (QInF), 2017, Qualcomm, India. Worked on monocular multi-object tracking of other traffic participants. In this work we propose intuitive, easy to implement, and complementary cues, a linear combination of which act as assignment cost which are fed in a hungarian based matching for association.*.

2016 – 2017   **Multi-Robot Simultaneous Localization and Mapping Project**, *Robotics Research Center, IIIT Hyderabad. Funded by Center for Artificial Intelligence and Robotics, Defense Research and Development Organization **(CAIR-DRDO)**, India. Spent about an year on stereo SLAM, safe and feasible frontier detection for robot, collection of data, and system setup.*.

2013 – 2015   **Voice Controlled Wheelchair Project**, *Raman Research Institute, Bangalore. Funded by **Department of Science and Technology** (DST), India*, Worked on voice activated intelligent wheelchair project. Designed and developed a light-weight and multi-threaded software framework in C++ for speech based activation of electric wheelchair. Developed all the required functionality such as motion, PID control, speed control, obstacle detection, integration of speech recognition engine, visual and auditory feedback interface, etc. .

2013 – 2015   **VACU - Voice Activated Control Unit**, *Raman Research Institute, Bangalore. Funded by **Department of Science and Technology** (DST), India*, VACU is an innovative, inexpensive, and standalone embedded solution for voice activation of a powered wheelchair platform to enable the physically challenged people become self-reliant for their locomotion. It is completely based on COTS hardware and provides interfaces for thumb-sticks, sonar sensors,and a compass sensor with PID control for steady motion and collision avoidance; it also has a visual and auditory feedback interface. .

2011 – 2013   **Corridor detection in point cloud**, *Raman Research Institute, Bangalore, India*, Corridor is detected in the point cloud by looking for a dominant parallel line separated by a distance threshold in a 2D scan generated from the 3D data captured from Kinect sensor (we avoid plane segmentation for speed). The project was implemented in MATLAB..

2011 – 2013   **6D Visual Odometry Using RGB-D Cameras**, *Raman Research Institute, Bangalore. Funded by **Department of Science and Technology** (DST), India*, Implemented the full 6DoF Visual Odometry pipeline in C++ with OpenCV using Microsoft Kinect for smart wheelchair project to aid *Quadriplegic patients*. No OpenCV functions used for the core functions..

2011   **Draw-In-Air**, *Independent research project*, Draw-In-Air is an application for drawing, capturing images and controlling the mouse by color marker based gestures. Developed an algorithm for recognizing simple gestures employing two color markers for image capture..

Fellowships, Awards, and Academic Services

2019   **Reviewer**, *IEEE Intelligent Vehicles (IV) Symposium*.

2018   **Teaching Assistant**, *CSE483 Mobile Robotics (robotic vision)*.

2017 – 2018   **Fellow**, *Qualcomm Innovation Fellowship (QInF), India*, [Link].

2017   **Winner**, *Qualcomm Innovation Fellowship (QInf), India*, [Link].

2011–2012	**Fellow**, *Visiting Student Programme, Raman Research Institute, Bangalore, India.*
2010	**First Prize**, *Inter-state C programming competition. Competition organized by IEEE Student Branch, SVCE, Bangalore, India.*
2007	**Fourth Prize**, *On-spot C programming competition. Competition organized by CSE Department, SVCE, Bangalore, India.*

Skills

Programming	C++, MATLAB, Robot Operating System (ROS), Python, Arduino
Libraries	g2o, OpenCV, ROS, ceres-solver
Platforms	Windows, Linux