Junaid Ahmed ANSARI

Researcher | TCS Research, Kolkata, India

🔗 Webpage   in linkedin.com/in/junaidcs032   ⬡ github.com/JunaidCS032
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Research interests : Interplay of computer vision, robotics, deep/reinforcement learning and human visual attention.

🎓 EDUCATION

2016-2019	**MS by Research** in Computer Science and Engineering, International Institute of Information Technology, Hyderabad, India. **GPA : 9.33/10.0**
2007-2011	**Bachelor of Engineering** (B.E.) in Computer Science and Engineering, SVCE, Bangalore, India. **Percentage : 68% (First Class)**

💻 RESEARCH/WORK EXPERIENCE

Sep'19 - Now

Researcher | Cognitive Robotics group, TCS RESEARCH, KOLKATA, India
Conducting research in perception for understanding human visual attention and human-human/human-robot interaction for autonomous and socially compliant robot navigation.
Computer Vision | Robotics | Deep Learning | Reinforcement Learning | Human Visual Attention | Crowd Simulation

Developer | Cognitive Robotics group, TCS RESEARCH, KOLKATA, India
Conducted research in perception and navigation for fast and accurate human motion forecasting on CPUs for autonomous and socially compliant robots. Worked on navigation of robots amidst dynamic humans.
Computer Vision | Robotics | Deep Learning

Jul'16 - Jul'19

Research Assistant | Robotics Research Center, IIIT HYDERABAD, HYDERBAD, India
Conducted research in perception for autonomous driving in the areas of SLAM, monocular multi-body SLAM, multi-object tracking and trajectory forecasting. Also, stereo SLAM, multi-robot SLAM and frontier detection for autonomous robotic exploration
Computer/Machine Vision | Robotics | Deep Learning

Monsoon 2018

Teaching Assistant | CSE483 Mobile Robotics (Perception/Robotics), IIIT HYDERABAD, HYDERBAD, India
Co-taught the Mobile Robotics (Perception/Robotics) course with Prof. K. Madhava Krishna
Computer/Machine Vision | Robotics

Aug'15- Jun'16

Research Intern | Raman Research Institute, BANGALORE, India
Worked on variety of projects related to Voice Activated Wheelchair project with Prof. Ramesh Balasubramanyam; these include visual odometry, wheelchair control, voice recognition and software framework design and development.
Computer/Machine Vision | Robotics | Software Architecture | Hardware

Jun'13 - May'15
Job Position

Temporary Project (Research) Assistant | Raman Research Institute, BANGALORE, India
Worked on variety of projects related to Voice Activated Wheelchair project and Brain Computer Interface project with Prof. Ramesh Balasubramanyam and Prof. Hema Ramachandran.
Computer/Machine Vision | Robotics | Software Architecture | Hardware

Jul'11-Mar'13

Research Intern | Raman Research Institute, BANGALORE, India
Worked on variety of projects related to Voice Activated Wheelchair project with Prof. Ramesh Balasubramanyam; these include visual odometry, wheelchair control, voice recognition and software framework design and development.
Computer/Machine Vision | Robotics | Software Architecture | Hardware

🏆 HONORS AND AWARDS

2021	**Finalist, best student paper award**. BirdSLAM, VISSAP (VISIGRAP), 2021
2017-2018	**Qualcomm Innovation Fellowship (QInF)**. Our proposal was shortlisted as finalist for QInF, India.
2017-2018	**QInF Award**. Our proposal was awarded **INR 10 00 000** for being the Finalis in the QInF, India
2016-2019	**IIIT Hyderabad research fellowship**. Awarded a fellowship to cover tuition and living expenses during my Masters. Total value (approx.) **INR 300 000**
2018	**Microsoft Research Travel grant.** Awarded to cover my travel expenses for IROS 2018, one of the premier robotics conferences.
2018	**IROS SDC Travel Award.** Awarded to cover my travel expenses for IROS 2018.
2015-2016	**Visiting Student Fellowship** Raman Research Institute, Bangalore, India.
2011-2012	**Visiting Student Fellowship** Raman Research Institute, Bangalore, India.
2010	**First Prize, Inter-state C programming competition**. organized by IEEE Student Branch,SVCE, Bangalore
2007	**Fourth Prize, On-spot C programming competition**. Organized by CSE Department, SVCE, Bangalore

📖 Publications

Simple means Faster : Real-Time Human Motion Forecasting in Monocular First Person Videos on CPU   IROS, 2020
Junaid Ahmed Ansari, Brojeshwar Bhowmick
🔗 Paper   🔗 Video

BirdSLAM : Monocular Multibody SLAM in Bird's-Eye View   VISSAP, 2021
Swapnil Daga, Gokul B. Nair, Anirudha Ramesh, Rahul Sajnani, **Junaid Ahmed Ansari**, K. Madhava Krishna
🔗 Paper   🔗 Video
Finalist - Best Student Paper Award

Multi-object Monocular SLAM for Dynamic Environments   IV, 2020
Gokul B. Nair, Swapnil Daga, Rahul Sajnani, Anirudha Ramesh, **Junaid Ahmed Ansari**, K. Madhava Krishna
🔗 Paper   🔗 Video

INFER : Intermediate representations for distant FuturE pRediction   IROS, 2019
Shashank Srikanth, **Junaid Ahmed Ansari**, Sarthak Sharma, J Krishna Murthy, K. Madhava Krishna
🔗 Paper   🔗 Video   🔗 Project Page   🔗 Code

The Earth ain't Flat : Reconstruction of Vehicles on Steep and Graded Roads from a Monocular Camera IROS, 2018
Junaid Ahmed Ansari*, Sarthak Sharma*, A Majumdar, J Krishna Murthy, K. Madhava Krishna
🔗 Paper   🔗 Video   (* Equal contribution)

Beyond Pixels : Leveraging Geometry and Shape Cues for Online Multi-Object tracking   ICRA, 2018
Sarthak Sharma*, **Junaid Ahmed Ansari***, J Krishna Murthy, K. Madhava Krishna
🔗 Paper   🔗 Video   🔗 Project page   🔗 Code   (* Equal contribution)
SOTA on KITTI Tracking Benchmark-2018

An Open Voice Command Interface Kit   IEEE Trans. on Human-Machine Systems, 2016
Junaid Ahmed Ansari, Arasi Sathyamurthi, Ramesh Balasubramanyam
🔗 Paper   🔗 Video   🔗 Project page   🔗 Code

VACU - Voice Activated Control Unit   Poster, Indo-German workshop on Neurobionics in clinical Neurology, 2012
Arasi Sathyamurthi, **Junaid Ahmed Ansari**, Ramesh Balasubramanyam, Hema Ramachandran
🔗 Poster   🔗 Video

💻 Projects

Real-time monocular object SLAM system for dynamic road scenes   2017 - 2018
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. We relied on Shape Priors for metric level monocular reconstruction of dynamic vehicles from a moving camera.
Computer/Machine Vision   Robotics   Deep Learning

Safe and feasible frontier detection for autonomous ground vehicles   2016-2017
Robotics Research Center, IIIT Hyderabad
Developed a ROS (C++) package for detection of safe and feasible frontiers for autonomous ground vehicles. Obstacles are segmented by fitting road plane (along with camera height information) to the 3D point cloud generated using a stereo camera. Based on the obstacle information, vehicle dimension, frontier direction, and traversibility we compute all possible headings which are safe and feasible for the robot to move in.
Computer/Machine Vision   Robotics   Robot Operating System

Multi-Robot Simultaneous Localization and Mapping Project   2016 - 2017
Robotics Research Center, IIIT Hyderabad. Funded by Center for Artificial Intelligence and Robotics (**CAIR**)
Worked on stereo SLAM, stereo visual odometry, AR Tag based multi-robot map merging, collection of dataset and system setup of two mobile robot platforms.
Computer/Machine Vision   Robotics   Hardware   Robot Operating System

Voice Controlled Wheelchair Project   2013 - 2015

Raman Research Institute (RRI), Bangalore. Funded by RRI
Worked on voice activated 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.

Computer/Machine Vision · Robotics · Hardware · Robot Operating System

🖳 SHORT TERM PROJECTS (2011 - 2016)

CORRIDOR DETECTION IN POINT CLOUD

Raman Research Institute (RRI), Bangalore
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.

Computer/Machine Vision

6D VISUAL ODOMETRY USING RGB-D CAMERAS

Raman Research Institute (RRI), Bangalore
Implemented the full 6DoF Visual Odometry pipeline in C++ with OpenCV using Microsoft Kinect. No OpenCV functions used for the core functions.

Computer/Machine Vision

DRAW-IN-AIR

SVCE, Bangalore
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.

Image Processing

EASYTESTVR

Raman Research Institute (RRI), Bangalore
It is an application written in Processing (Java) for automatic analysis of 'recognition accuracy', 'response time', and other factors affecting the voice recognition of the COTS 'non-continuous speech recognition boards'.

SINGLE BEAM REFLECTION PATTERN SIMULATOR FOR SURFACES IN 2D

Raman Research Institute (RRI), Bangalore
This C++ application simulates the reflection of a user defined arrangement of arbitrary number of surfaces; it is a 2D case of a full-fledged simulator for the analysis of Radio Telescope surfaces for focus and undulation correction.

🎓 PROFESSIONAL SERVICES AND VOLUNTEERING

2020	Reviewer, ICRA (IEEE International Conference on Robotics and Automation)
2020	Reviewer, WACV (Winter Conference on Applications of Computer Vision)
2020	Reviewer, AAAI (Association for the Advancement of Artificial Intelligence)
2019-Present	Reviewer, IROS (IEEE/RSJ International Conference on Intelligent Robots and Systems)
2019-Present	Reviewer, IV (IEEE Intelligent Vehicle Symposium)
2019-Present	Reviewer, RO-MAN (IEEE International Conference on Robot & Human Interactive Communication)
2018	Student volunteer in R&D Showcase, 2016, Robotics Research Center, IIIT Hyderabad, India
2016	Student volunteer in R&D Showcase, 2016, Robotics Research Center, IIIT Hyderabad, India

🎓 SKILLS

Programming	C/C++, MATLAB, Python
Libraries	g2o, PyTorch, OpenCV, ROS, ceres-solver, ORCA
Operating System	Windows, Linux

❝ REFERENCES

Brojeshwar Bhowmick	K. Madhava Krishna	Ramesh Balasubramnyam
Senior Scientist	*Professor, IIIT Hyderabad*	*Associate Professor*
TCS RESEARCH, INDIA	HEAD OF ROBOTICS RESEARCH CENTER	RAMAN RESEARCH INSTITUTE, INDIA
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