

# Kanishk Jain

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## EDUCATION

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**International Institute of Information Technology**

*MS by Research in CSE; GPA: 9.33/10*

Hyderabad, India

*Aug 2021 – Nov 2022*

**International Institute of Information Technology**

*B.Tech (Honors) in ECE; GPA: 6.73/10*

Hyderabad, India

*Aug 2013 – Jun 2017*

## RESEARCH INTERESTS

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I am interested in the following research topics: learning from multiple data modalities, language understanding in autonomous systems during navigation, explainable deep learning, multi-object tracking, improving robustness to domain shifts and adversarial attacks, learning in low-data regimes, and ensemble learning.

## RESEARCH PUBLICATIONS

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**Test-Time Amendment with a Coarse Classifier for Fine-Grained Classification**

Paper

*Kanishk Jain, Shyamgopal Karthik, Vineet Gandhi*

*Under Review*

- A post-hoc correction approach for reducing mistake severity in neural networks by leveraging coarse-grained predictions at test-time to improve the performance of fine-grained classification.

**Ground then Navigate: Language-guided Navigation in Dynamic Scenes**

Paper

*Kanishk Jain\*, Varun Chhangani\*, Amogh Tiwari, K Madhava Krishna, Vineet Gandhi*

*ICRA 2023*

- A novel visual-grounding based approach to language-guided navigation in dynamic outdoor environment.

**Bringing Generalization to Deep Multi-View Pedestrian Detection**

Paper

*Jeet Vora, Swetanjali Dutta, Kanishk Jain, Shyamgopal Karthik, Vineet Gandhi*

*WACV-W 2023*

- Designed a comprehensive evaluation framework along with a novel dataset to assess the generalization capabilities of existing MVD methods.

**Comprehensive Multi-Modal Interactions for Referring Image Segmentation**

Paper

*Kanishk Jain, Vineet Gandhi*

*ACL Findings 2022*

- Proposed a novel architecture for Referring Image Segmentation which captures comprehensive interactions between visual and linguistic modalities in a synchronous manner with effective multi-hierarchy aggregation.

**Grounding Linguistic Commands to Navigable Regions**

Paper

*Kanishk Jain\*, Nivedita Rufus\*, Unni Krishnan\*, Vineet Gandhi, K Madhava Krishna*

*IROS 2021*

- Introduced the novel task of Referring Navigable Regions (RNR), i.e., grounding regions of interest on road for navigation based on the linguistic command.

## WORK EXPERIENCE

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**Optra Sports**

*Co-Founder*

*Dec 2022 – Present*

- Developed top-view player tracking toolkit for the game of cricket.
- Collaborating with Start Sports (a Disney sports broadcast company) and AE Live (a graphics company for sports broadcasting) for live deployment in future cricket tournaments.

**CVIT, IIIT Hyderabad**

*Research Engineer*

*Dec 2022 – Present*

- Working on the research problem of reducing mistake severity of neural networks for fine-grained classification.
- Mentoring masters students with research problem formulation for their graduate thesis.

**CVIT, IIIT Hyderabad**

*Research Assistant*

*Sep 2019 – Nov 2022*

- Worked under guidance of Dr. Vineet Gandhi on Visual Grounding and its application in different multi-modal problem setting.
- Collaborated with Dr. K. Madhava Krishna on Language-guided Navigation leading to a publication at IROS-2021

- Part of the super winner team of Qualcomm Innovation Fellowship (QIF) 2020.
- An analytics tool for CSGO games providing relevant insights into winning strategies.

## Turvo

*Software Engineer*

*Jul 2017 – Aug 2019*

- Integrated Xero Accounting Platform with Turvo platform using Pub-Sub messaging pattern for handling different accounting scenarios.
- Added capability of Batch Payment Processing to allow users to schedule and process multiple payments at once.
- OCR over Document Images using active learning based template detection for extracting information from unstructured documents.
- Implemented New Feature Notification Modal for users.

## SELECTED PROJECTS

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**Top-View Player Tracking:** Player tracking solution in the Bird's Eye View, deployed live in 2022 Asia Cup.

**Stereo SLAM:** Generate 3D point clouds using stereo images and use 2D-3D correspondences to estimate motion/pose using iterative Perspective-from-n-Points (PnP) algorithm.

**Pose Graph Optimization:** Used Levenberg–Marquardt algorithm to optimize for robot's poses by applying Odometry and Loop Closure constraints for 1D & 2D SLAM.

**Neural Nearest Neighbor Networks:** Implemented the NeurIPS paper, "Neural Nearest Neighbor Networks" as part of course project.

**Unity Game for Amblyopia (*Hons. Project*):** Developed a Unity Game for diagnosis of Amblyopia. The game is played using eye gaze movements captured using an eye tracker.

**Text to Braille Converter:** A learning tool for people with no vision. Converts a given text to braille and audio.

**Neuro Rehab Systems:** A rehabilitation tool which aims to aid recovery from a nervous system injury and minimize any functional alterations resulting from it.

## TECHNICAL STRENGTHS

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**Languages:** Python, Java, C++, C#, Node JS, Javascript

**Frameworks:** PyTorch, Keras, Tensorflow, OpenCV, scikit-learn, scikit-image

**Tools:** CARLA, TensorRT, Open3D, Unity 3D, Matlab, Spring Boot, Maven, REST

**Databases:** MySQL, Mongo DB, Elasticsearch, Apache Solr, Redis

## RELEVANT COURSES

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**ML/AI Courses:** Statistical Methods in AI, Computer Vision, Mobile Robotics, Topics in Optimization Methods, Topics in ML, Cognitive Science and AI

**Core Science:** Computer Programming, Operating Systems and Algorithms, Data Structures

**Other Courses:** Digital Image Processing, Digital Signal Processing, Linear Algebra, Probability and Random Processes, Discrete Mathematics

## ACHIEVEMENTS

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**Qualcomm Innovation Fellowship:** Led the super winner team of Qualcomm Innovation Fellowship (QIF) 2020 India.

**JEE Mains:** Ranked in National Top 0.2% (amongst 1,200,000 candidates) in JEE Mains.

**JEE Advanced:** Secured 4539 rank in JEE Advanced among 150,000 candidates in JEE Advanced.

**R&D Showcase:** Presented the Amblyopia Game at college's annual R&D showcase.