Anshul Paigwar

ABOUT ME

p.anshul6@gmail.com
https://anshulpaigwar.github.io/

ACADEMICS

Master's in Graphics, Vision, and Robotics

2017–2018 University of Grenoble Alpes (ENSIMAG) - France

Specialisation:
Machine learning & Pattern Recognition, Multi-view geometry, SLAM, Autonomous Robotics

Bachelor's in Mechanical Engineering

2012–2016 Visvesvaraya National Institute of Technology (VNIT), Nagpur, India

LEADERSHIP

Délice Robotics, Founder

2020 – 2021 | INRIA, Grenoble, France
https://delicerobotics.com

Founded and led Delice Robotics, securing a €100,000 grant to develop AI-powered food preparation robots, reducing prep time and enhancing profitability.

Gained hands-on expertise in robot manipulation (UR5), 3D CAD modelling, and complex hardware integration for scalable robotic solutions.

Managed a team of 3 engineers, guiding technical development, project timelines, business development, pitching investors and fundraising.

IvLabs, Cofounder

2013 – 2016 | VNIT, Nagpur, India
www.ivlabs.in

I helped kickstart IvLabs, a student's robotics and AI lab at VNIT. IvLabs has grown to be among the top robotics labs in India with over 100 active members.

WORK EXPERIENCES

Oxa, Senior ML Engineer

Sept 2022 – Present | Oxford, UK

- Spearheaded research, design, and implementation of transformer-based BEVFusion models for multi-sensor (Lidar, Camera, Radar) 3D object detection, enhancing autonomous vehicle perception.
- Developed safety-focused perception redundancies, including Vision and Laser Occupancy and Velocity Estimation Networks, deployed on NVIDIA Orin platforms.
- Managed the end-to-end machine learning lifecycle on Google Cloud, covering ETL, data augmentation, large-scale GPU Kubernetes training, hyperparameter tuning, performance metrics and continuous evaluation, ensuring reproducibility and facilitating rapid iteration.
- Deployed high-performance deep learning models to production via NVIDIA Triton Inference Server for low-latency, scalable real-time operations.
- Built pipelines for high-quality ground truth generation through 3D auto-annotation, hi-fidelity simulation, and managed manual labelling with external partners.
- Architected and optimised high-throughput ML data pipelines, established a robust feature store, and managed diverse datasets (e.g., Protobuf, Parquet, MongoDB, BigQuery).

INRIA, Research Engineer

Oct 2018 – July 2022 | Grenoble, France

- Led cutting-edge research in computer vision and 3D scene understanding for autonomous vehicles with a focus on robustness and real-time perception. Published over 20 peer-reviewed articles in top Robotics and AI conferences (e.g., ICCV, IROS, ICRA, CVPR, ITSC), across critical perception tasks:
- Frustum-PointPillars: 3D object detection in point clouds. Ranked top 5 for pedestrian detection on the KITTI dataset leaderboard. *(ICCV'21 paper | code)*
- GndNet: Fast Ground plane estimation and point cloud segmentation, achieving inference at 55 Hz, currently SOTA. *(IROS'20 paper | code)*
- 2D Object Detection and Disparity Estimation: Addressed adverse weather conditions by integrating RGB and Event-based cameras. *(ICRA'22 paper, CVPR'21 paper)*
- Other key contributions include occupancy grid prediction, reachability space estimation and collision risk estimation, and validation in the CARLA simulator.
- Semantic Grid prediction and Motion Forecasting using Spatio-Temporal networks and Transformers. *(ICARCV'22 paper, ITSC'22 paper)*
- Managed and mentored a team comprising two research engineers and several interns, directing their efforts towards research projects and publications.

INRIA, Master Thesis

Feb - Sept 2018 | Grenoble, France | under the supervision of Prof Christian Laugier

- Proposed and developed Attentional-PointNet, a new deep architecture for real-time 3D object detection in point clouds, using Spatial Transformer Networks and Recurrent Visual Attention for efficient computational savings. (CVPR'19 workshop paper | code | thesis)

INRIA, Bachelor Thesis

May - Dec 2016 | Grenoble, France

- Engineered a ground plane estimation algorithm for large 3D point clouds, utilising Markov Random Fields and Expectation Maximisation for robust object segmentation and occupancy grid generation. *(IV'17 paper | video)*

SKILLS

Programming
Python | C++ | CUDA

Tools
Google Cloud Platforms | CI-CD | Jenkins Docker Containers | Kubernetes | FiftyOne | MongoDB | Apache Arrow | Big Query | Vertex AI | ClearML | AIMSTACK Git | JIRA |

Software
PyTorch | TensorFlow | Keras | ONNX | TensorRT | OpenCV | ROS | Scikit-learn | CARLA | Gazebo | MoveIt | PCL Navigation Stack

ML Models
BEVFusion | BEVDet | PointPillars | ResNet | DeepLab | Yolo | SSD | ViT | DETR | SAM | LLMs | BERT| CLIP

Datasets
KITTI | Argoverse | Nuscenes | CityScapes ModelNet-40 | ImageNet | COCO

ACTIVITIES

2016
Invited by the President of India
I represented VNIT in the 'Meeting of Innovators' organised by the President of India, Shri Pranab Mukherjee.

2018 - Present
Active reviewer in international conferences
ICRA, IROS, RAS, ITSC, IV, ITS Transactions, CIS-RAM

INTERESTS

Traveling | Hiking | Photography | Poetry | Skiing | Music | Movies & TV series | Sketching | Cooking | Pep Talks

INTERNSHIPS

Hitech Robotic Systems, Autonomous Vehicle Intern
May - Aug 2017 | Delhi, India, Team–AIV Autonomous Indoor Vehicle

- Worked on MiR 250 robot platform for warehouse automation, and developed an algorithm for Dynamic obstacle detection and tracking to pre-empt collisions.
- The algorithm uses point cloud data from an Intel RealSense stereo camera, which involves Octree-based 3D spatial change detection for classification of static and dynamic objects, Kalman filter-based tracking of dynamic objects, and their state prediction. *code* / *video*

Institute of Infocomm Research | NTU, Research Internship
May - Aug 2015 | Singapore Autonomous vehicle project by A-STAR

- Worked on an autonomous Toyota eCom platform. Designed an Extended Kalman filter-based sensor fusion system to fuse odometry, inertial and GPS sensor data for accurate localisation of the vehicle. *video*
- 3D Lidar-based Road boundary detection and tracking. *video*
- Designed an RGB camera-based Visual Road Recognition and Horizon Detection using Artificial Neural Networks. *video*

PROJECTS
list of all projects: *link*

Sahayak, an autonomous COVID Aid-Bot
Mar 2020 – Sept 2020 | VNIT, Nagpur, India

- 'Sahayak' (Helper in Hindi) is an autonomous mobile robot that was aimed to facilitate the healthcare workers by enabling contactless communication & delivery of utilities in hospital environments. *(ISMR'21 poster | website)*
- Led a team of students at VNIT for the development of the Hardware & Software Stack. We used Hector SLAM to map a hospital floor, AMCL for localisation, and ROS move_base for point A to B navigation. The robot was deployed in AIIMS Nagpur.

RECENT PUBLICATIONS
More than 20 Publications in top international conferences, full list on *Google Scholar*

Abhishek Tomy, Anshul Paigwar, Khushdeep Singh Mann, Alessandro Renzaglia, Christian Laugier. Fusing Event-based and RGB camera for Robust Object Detection in Adverse Conditions. IEEE International conference on Robotics and Automation, ICRA 2022, Ph, USA. *link*

Anshul Paigwar, David Sierra-Gonzalez, Özgür Erkent, Christian Laugier. Frustum-PointPillars: A Multi-Stage Approach for 3D Object Detection using RGB Camera and LiDAR. AVVision Workshop - ICCV 2021.

Anshul Paigwar, Ozgur Erkent, David Sierra Gonzalez, Christian Laugier, "GndNet: Fast Ground Plane Estimation and Point Cloud Segmentation for Autonomous Vehicles", IEEE International conference on Robotics and Systems, IROS 2020, Las Vegas, USA. *link*

Anshul Paigwar, Ozgur Erkent, Christian Wolf, Christian Laugier, "Attentional PointNet for 3D Object Detection in Point Clouds", CVPR 2019 workshop on Autonomous Driving, Long Beach California. *link*

PATENTS

Anshul Paigwar, Sai Teja Manchukanti, KM Burchandi, Ashwin Kothari. "Device for Navigation Assistance in or no visibility ambience". The Patent Office, Government of India – Patent No.535176.

Agrawal Sapan, Akash Singh, Gadwe Aniket, Anshul Paigwar, KM Burchandi, Ashwin Kothari, "Design of 20 DOF, kid-sized Humanoid Robot", The Patent Office, Government of India – Patent No.517158