

Chirag Parikh

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INTERESTS

Computer Vision · Video Understanding · Video-Language Modeling · Multimodal Learning · Explainability · Visual Grounding · Deep Learning · Advanced Driver Assistance Systems (ADAS)

EDUCATION

- **International Institute of Information Technology, Hyderabad** 2022 - Present
Ph.D. in Computer Science and Engineering
◦ Advisor: Prof. Ravi Kiran Sarvadevabhatla
CGPA: 9.33/10
- **Birla Institute of Technology, Mesra** 2013 – 2017
Bachelor of Engineering in CET
◦ Conducted undergraduate research on Computer Vision in Friction Stir Welding (FSW), Advisor: Prof. Surjya K. Pal
◦ Winner of MathWorks Prize (ABU Robocon 2015) and 1st Place at Vertechx 2014 (robotics)
◦ Organized workshops/competitions as Robotics Club executive
CGPA: 7.34/10

EXPERIENCE

- **IIIT-H, Center for Visual Information Technology (CVIT) Lab**  2022 - Present
PhD Researcher
◦ Research in video question answering, driver behavior modeling and explanation, and road scene understanding.
◦ Contributed to papers in CVPR 2025, ICRA 2024 on road event understanding and driving behavior explanation in dense and unstructured traffic.
- **The Hi-Tech Robotic Systemz Ltd.**  2019 - 2022
Senior Research Engineer (ADAS)
◦ Designed HydraNet for Driver State Monitoring (DMS) with real-time inference on embedded platforms.
◦ Achieved >95% accuracy across multiple subtasks in DMS (eye-closure, smoking, yawning, phone activity).
◦ Optimized CNNs, created custom datasets, and deployed models on resource-constrained ARM devices.
- **FarmGuide**  2017 - 2019
Computer Vision Engineer (Remote Sensing)
◦ Developed CV + geospatial models for cropland detection from satellite imagery.
◦ Built cloud-scalable pipelines using AWS (EC2, Lambda, S3).
◦ Applied deep edge detection (HED), clustering, and time-series analysis to remote sensing data.
- **Prakshep**  Jan - May 2017
Data Science Intern
◦ Analyzed raster image data and embedded R-code in MySQL to enable real-time GIS queries from SAP HANA DB for agricultural applications.
- **IIT Kharagpur, FSW Lab (Machine Vision)**  Summer of 2015 & 2016
Research Intern
◦ Developed novel image-based methods to detect FSW defects from 3D reconstructions and time-series signals.
◦ Co-invented and co-authored a patent and 2 journal papers for computer vision application in manufacturing processes.

PUBLICATIONS

C=CONFERENCE, J=JOURNAL, P=PATENT, A=ARXIV, T=THESIS

- [C.1] **Chirag Parikh**, Deepti Rawat, Rakshitha R. T., Tathagata Ghosh, Ravi Sarvadevabhatla. **RoadSocial: A Diverse VideoQA Dataset and Benchmark for Road Event Understanding from Social Video Narratives**. In proc. of *IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*, 2025 [Paper], [Project Page]
- [C.2] Ravi Shankar Mishra, **Chirag Parikh**, Anbumani Subramanian, C.V.Jawahar, Ravi Kiran Sarvadevabhatla. **IDD-CRS: A Comprehensive Video Dataset for Critical Road Scenarios in Unstructured Environments**. In proc. of *IEEE Intelligent Vehicles Symposium (IV)*, 2025 [Paper]
- [C.3] **Chirag Parikh**, Rohit Saluja, CV Jawahar, Ravi Sarvadevabhatla. **IDD-X: A Multi-View Dataset for Ego-relative Important Object Localization and Explanation in Dense and Unstructured Traffic**. In proc. of *IEEE International Conference on Robotics and Automation (ICRA)*, 2024 [Paper], [Project Page]
- [A.1] **Chirag Parikh**, Ravi Shankar Mishra, Rohan Chandra, Ravi Sarvadevabhatla. **Transfer-LMR: Heavy-Tail Driving Behavior Recognition in Diverse Traffic Scenarios**. Submitted for publication in *MTA Journal*, 2024 [Paper], [Code]

- [C.4] Prafful Kumar Khoba, **Chirag Parikh**, Rohit Saluja, Ravi Kiran Sarvadevabhatla, C.V. Jawahar. **A Fine-Grained Vehicle Detection (FGVD) Dataset for Unconstrained Roads**. In proc. of *Thirteenth Indian Conference on Computer Vision, Graphics and Image Processing (ICVGIP)*, 2022 [Paper], [Code]
- [P.1] Surjya Kanta Pal, Aaquib Reza Khan, Ravi Ranjan, **Chirag Parikh**, Srikanta Pal, Debashish Chakravarty, Abhik Maiti. **Real-Time Surface Defect Analysis and Correction in Friction Stir Welding Process by Image Processing**. IN, Patent No. 514971. File Date: 20/09/2018, Grant Date: 26/02/2024. [Grant Certificate]
- [J.1] **Chirag Parikh**, Ravi Ranjan, Aaquib Reza Khan, Rahul Jain, Raju Prasad Mahto, Debashish Chakravarty, Srikanta Pal, Surjya K. Pal. **Volumetric defect analysis in friction stir welding based on three dimensional reconstructed images**. *Journal of Manufacturing Processes, Elsevier*, 2017 [Paper]
- [J.2] Ravi Ranjan, Aaquib Reza Khan, **Chirag Parikh**, Rahul Jain, Raju Prasad Mahto, Srikanta Pal, Surjya K. Pal, Debashish Chakravarty. **Classification and identification of surface defects in friction stir welding: An image processing approach**. *Journal of Manufacturing Processes, Elsevier*, 2016 [Paper]

PROJECTS

- **Differential Attention Networks for Visual Question Answering** 2023
 IIIT-H Computer Vision course project advised by: Prof. Avinash Sharma
 ◦ [Report], [Code]
- **Integrating storage manager (TASM) and query optimizer (FiGO) in Video-DBMS** 2025
 IIIT-H Data Systems course project advised by: Prof. Kamal Karlapalem
 ◦ [Report], [Code], [Video]
- **Driver Activity Recognition for Driver State Monitoring from Infrared Videos** 2019-2022
 Sr. Research Engineer at The Hi-Tech Robotic Systemz Ltd.
 ◦ Designed a multi-task HydraNet-style architecture with BlazeFace as the shared backbone and task-specific heads for face detection, 3D 68-landmark prediction, eye state classification for drowsiness detection, and activity detection (smoking, yawning, phone usage).
 ◦ Curated a 100K+ Infrared Camera Face Detection and 3D Landmark Prediction dataset using RetinaFace and 3DDFA-v2.
 ◦ Built end-to-end TensorFlow pipelines with TFRecord-optimized loading, custom loss functions, and advanced data augmentation strategies.
 ◦ Deployed quantized TFLite models on resource-constrained ARM devices with a custom C++ inference engine, achieving real-time performance (28 FPS) and 2× speedup over MediaPipe.
 ◦ Improved model robustness via pose-conditioned face synthesis (Conditional-BEGAN), fine-tuned HOG+SVM detectors for masked faces, and boosted eye state classification accuracy to 96% through targeted augmentations.
- **Cropland Detection from Satellite Imagery** 2019-2022
 Computer Vision Engineer at FarmGuide
 ◦ Achieved 85% accuracy in cropland detection by segmenting farm boundaries on high-resolution satellite imagery using a transfer-learned Holistically-nested Edge Detection (HED) model.
 ◦ Created a farm boundaries training dataset via unsupervised Graph Cut segmentation refined through contour analysis and morphological processing.
- **Real-time Shuttlecock Tracking and Trajectory Estimation for Badminton Playing Robot** 2015
 BIT Mesra Robotics Club project for ABU Robocon 2015 supported by: Prof. Arun Dayal Udai
 ◦ [Report], [Code], [Video]

SKILLS

- **Languages:** Python, C++, R, MATLAB
- **Frameworks:** PyTorch, TensorFlow, Keras, OpenCV, dlib
- **Tools:** Git, Docker, Conda, TFDS, AWS (EC2, S3, Lambda)
- **Embedded Platforms:** Snapdragon Dragonboard, Odroid XU4, Raspberry Pi, Atmega16/32