Chirag Parikh

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Interests

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

Education

- **International Institute of Information Technology, Hyderabad** *2022 - Present*
  Ph.D. in Computer Science and Engineering CGPA: 9.33/10
  - Advisor: Prof. Ravi Kiran Sarvadevabhatla
- **Birla Institute of Technology, Mesra** *2013 – 2017*
  Bachelor of Engineering CGPA: 7.34/10
  - 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

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] **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]

[C.3] 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]

[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** *2021*
  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** *2018*
  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