Harshith Mohan Kumar

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EDUCATION

University of California, Riverside **Master of Science, Computer Science** Dec 2024 (Expected)| Riverside, CA
GPA: 3.92 |Thesis: Thermal Optical Flow

PES University Bachelor of Technology, Computer Science Aug 2019 - Jul 2023 | Bangalore, KA
Specialization in Machine Intelligence and Data Science

SKILLS

Languages: Python, C, C++, Java
Backend: Docker, Git, AWS, GCP
Systems: Linux, Slurm, CUDA
ML/Stats: PyTorch, OpenCV, Numpy, Keras
Research: Computational Photography, 3D Reconstruction, Autonomous Driving

EXPERIENCE

UNIVERSITY OF CALIFORNIA, RIVERSIDE Riverside, CA
Graduate Student Researcher |Co-Guided: Prof. Saragadam & Roy-Chowdhury Jul 2024 – Present
- Developed RGB-Thermal data capture stack with hardware synchronization and software calibration.
- Proposed a novel loss function that improved multi-modal optical flow end-point error by 70% compared to SOTA models.

INTEL Bangalore, India
R&D Intern Jan 2023 – Jul 2023
- Developed proof of concept to integrate severity of **collision avoidance** alerts to increase efficient vehicle fleet decisions.
- Designed novel semi-supervised learning framework using **PyTorch** to eliminate manual object detection labeling.
- Resulted in 20% improvement in model accuracy through domain adaptation and acceptance at **ICCV 2023.**

GOOGLE SUMMER OF CODE (Red Hen Labs) | Link Remote
Open-Source Contributor Jun 2022 – Sep 2022
- Automated segmentation of old TV Broadcast recordings using multi-modal deep learning.
- Enabled 15x efficiency through multi-threading and array jobs on a largescale HPC GPU cluster.
- Conducted music segmentation, **image segmentation**, and RNN-DBSCAN clustering on 100+ TB data.

ENROLE INC. Remote
Data Science Intern Jun 2020 – Aug 2020
- Designed and integrated a clustering-based recommender system for a mobile-first application using GCP and Scikit-Learn.

PROJECTS

Interpreting Collision Anticipation using Concept Bottleneck Models in Autonomous Driving
- Improved collision detection and model transparency by utilizing simulated accidents on **Carla** for concept mining.
- Incorporated concept bottleneck on visual contextual understanding extracted from OpenAI GPT 4 API.

OCTraN: 3D Occupancy Convolutional Transformer Network in Unstructured Traffic Scenarios | Link
- Propose a novel transformer architecture that uses iterative attention to convert 2D image features into 3D occupancy.
- Presented paper at **CVPR 2023** Transformers for Vision Workshop.

LEADERSHIP EXPERIENCE

RainCross Boxing Academy Riverside, CA
Student Volunteer
- Helping the youth with their homework and boxing drills to instill encouragement and a healthy lifestyle to the youth.

PES University Bangalore, India
Teaching Assistant Jun 2022 – Jul 2023
- Created course slides, practical python workbooks and automated labs for the *Data Analytics* and *Image Processing and Computer Vision* courses. Improved understanding of recommender systems and morphological processing for students.

PUBLICATIONS | Google Scholar

1. Fusing Pseudo Labels with Weak Supervision for Dynamic Traffic Scenarios | Link | ICCV 2022 BRAVO Workshop
2. GraphCoReg: Co-Training for Regression on Temporal Graphs | Link | ECML-PKDD 2023 MLG Workshop |*Best Paper* 🏆