Dheeraj Reddy Pailla

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Education

Georgia Institute of Technology Jan 2021 - present
Master of Science in Computational Science & Engineering, GPA: 4.0 *Atlanta, GA*

International Institute of Information Technology, Hyderabad (IIIT-H) Aug 2016 - May 2020
Bachelor of Technology (Honors) in Computer Science & Engineering, CGPA: 7.76, Major: 8.12 *Hyderabad, India*

- *Dean's Research List - in recognition of research contribution (2018-19, 2019-20)*
- *Dean's Merit List - top 20% of class (2018-19)*

Experience

SubtlAI Aug 2020 - Dec 2020
Research Engineer, ML team *Hyderabad, India*

- Worked on the Sutbl Bot project to develop efficient pipelines to read, understand and index documents for search
- My work pertained to supplementing document intelligence using OCR and deep learning language models

Siemens May 2019 - Jul 2019
Research Intern, Perception Lab *Bangalore, India*

- Worked on the Intelligent Traffic Management project to detect and classify vehicles on Indian roads using CenterNet with a DLA34 backbone achieving mAP of 88, improving existing pipeline by 7%. Deployed this model to Jetson TX2
- Made 2 submissions to the Vision Meets Drone challenge at ICCV 2019 - finished 5th in object detection in videos challenge, and 7th in object detection in images challenge using CenterNet with Hourglass104 backbone

Precog Aug 2018 - Dec 2020
Undergraduate Researcher, IIIT Delhi *New Delhi, India*

- Worked with **Prof Ponnurangam Kumaraguru ("PK")** on applications of computer vision and multimodal learning in social computing projects revolving around technology, hate speech, and human safety.
- Collected 6.4 million Snaps from 173 cities in "Driving the Last Mile" project. Developed WideResNet model to detect distracted driving content with 94.7% accuracy
- Created a novel dataset of over on online antisemitism. Developed WideResNet model to detect distracted driving content with 94.7% accuracy

Centre for Visual Information Technology May 2018 - April 2020
Undergraduate Researcher, IIIT Hyderabad *Hyderabad, India*

- Working under **Prof C.V. Jawahar** on event recognition in sports and object detection projects
- Developed person detection and recognition module based on YOLOv3 for the Autonomous Robot project
- Developed a system that utilized multiple cues such as motion and sound to recognize events in a football match like goals, fouls, corners or substitutions for the Automated Football Analysis project

Publications

- Hemank Lamba, Shashank Srikanth*, **Dheeraj Reddy Pailla***, Shwetanshu Singh, Karandeep Juneja, and Ponnurangam Kumaraguru. Driving the Last Mile: Characterizing and Understanding Distracted Driving Posts on Social Networks. Proceedings of the 14th International AAAI Conference on Web and Social Media. 2020.
- Mohit Chandra, **Dheeraj Reddy Pailla***, Himanshu Bhatia*, Aadilmehdi Sanchawala, Manish Gupta, Manish Shrivastava, Ponnurangam Kumaraguru. "Subverting the Jewtocracy": Online Antisemitism Detection Using Multimodal Deep Learning. Proceedings of the 13th ACM Conference on Web Science. 2021.
- Zhu, Pengfei, et al. VisDrone-DET2019: The Vision Meets Drone Object Detection in Image Challenge Results. Proceedings of the IEEE International Conference on Computer Vision Workshops. 2019.
- Zhu, Pengfei, et al. VisDrone-VID2019: The Vision Meets Drone Object Detection in Video Challenge Results. Proceedings of the IEEE International Conference on Computer Vision Workshops. 2019.

* - equal authors by contribution

Projects

Antisemitism Detection Using Multimodal Deep Learning
- Developed a multimodal deep learning system using DenseNet and RoBERTa that detects the presence of antisemitic content and its specific antisemitism category using text and images from social media posts
- Built two labeled antisemitism datasets with 3,102 and 3,509 social media posts collected from Twitter and Gab respectively
- Full paper currently under review at PAKDD-2021

Subtl Bot
- Developed a document ingestion pipeline to read scanned and text-based documents using Tesseract-OCR
- Implemented a keyword and semantics based indexing system using TextRank and Sentence-BERT to aid in document search

Driving The Last Mile
- Collected 6.4 million Snaps and official census data from 173 cities and developed a WideResNet model to detect distracted driving content with 94.7% accuracy
- First work to corroborate Lyng's edgework theory on social media - cities with higher male ratio and higher proportion of young people are more likely to produce more distracted driving snaps

Intelligent Traffic Management
- Developed a model based on CenterNet to detect and classify vehicles on Indian roads, achieving mAP of 88, improving existing YOLO based pipeline by 7%
- Exported this model to ONNX and then to TensorRT for execution on an edge device - Jetson TX2

Automated Football Analysis
- Collected data for all 64 matches of the FIFA World Cup 2018 and successfully built a pipeline to automatically detect events such as goals, fouls, corners, and substitutions
- Developed a system which is a linear combination of trajectory pooled convolutional descriptors (TDD) and a Support Vector Machine (SVM) to learn convolutional features for capturing appearance and motion cues

Hate Speech Analysis
- Detected and analyzed hate speech on alt-right website Gab during the Pittsburgh synagogue shooting
- Collected 10,000 posts on Gab - including the synagogue shooter's posts
- Built a model to detect hate speech and offensive language on Gab using logistic regression with L2 regularization

Bird-v-Drone
- Built a binary classifier to distinguish between birds and drones using Bag of Visual Words
- Classifier built using k-Nearest Neighbours with SIFT features

Bash
- Implemented a clone of the Bash terminal in C using system calls
- Utilised threading and multiprocessing to implement bash functions

Ultimate Tic-Tac-Toe Bot
- Developed the heuristic of a bot that plays Ultimate Tic-Tac-Toe on a 4x4x4x4 grid
- Implemented alpha-beta pruning along with Zobrist hashing to optimise game play

Game Development
- Developed clones of popular games such as Pacman Killer, Legend of Zelda, and Tunnel Rush using OpenGL in C++ and WebGL in Javascript
- Developed a clone of the Bomberman game on Python without any external libraries or packages

Skills

Machine Learning: PyTorch, ONNX, TensorRT, OpenVINO
Web Dev: React, Angular 4, Flask, Gin
Design: Photoshop, Illustrator
Other: C, C++, Python, Go, Matlab

Selected Coursework

Artificial Intelligence: Statistical Methods in AI, Artificial Intelligence, ML in Natural Sciences
Computer Vision: Computer Graphics, Digital Image Processing, Computer Vision
Social Computing: Privacy & Security in Online Social Media, Big Data & Policing
Systems: Operating Systems, Computer System Organization, Advanced Computer Networks