Vikram Murali Mandikal

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Education

The University of Texas at Austin — Austin, Texas
Master of Science in Computer Science — Aug 2019 - May 2021 (Expected)
Coursework: Machine Learning, Advanced Data Mining, Natural Language Processing, Statistical Machine Learning, Numerical Analysis: Linear Algebra

National Institute of Technology Karnataka (NITK), Surathkal
Bachelor of Technology in Information Technology — Surathkal, India
GPA: 9.79/10, Gold Medalist (Rank: 1/104) — Aug 2015 - May 2019

Past Internships

Microsoft Research — Bangalore, India
Research Intern | Tensorflow, Pytorch — August 2018 to December 2018
Advisors: Dr. Harsha Simhadri and Dr. Prateek Jain — and May 2019 to July 2019

- Worked on developing resource efficient machine learning algorithms which can be deployed on edge devices, specifically for keyword detection in speech and gesture recognition.
- Developed a novel meta learning algorithm which enables RNNs to make rolling predictions. This reduces the amortized computational complexity by an order of 100.
- Also contributed to the Shallow RNN project by designing shallow RNN based models for speech transcription. This is accepted at **NeurIPS 2019**.

Heidelberg Collaboratory of Image Processing, University of Heidelberg
Research Intern - DAAD WISE Fellowship | Pytorch, Python — Germany
Advisor: Prof. Fred Hamprecht — May 2018 to July 2018

- Designed a GAN framework for instance segmentation using the Mutex Watershed algorithm.
- Developed a novel smooth auxiliary loss which stabilized the GAN training and improved the performance. This work has been accepted at the **SGO&ML Workshop NeurIPS 2018**.

Video Analytics Lab, Indian Institute of Science — Bangalore, India
Research Intern | Theano, Python — May 2017 to July 2017

- Developed code for Spiking Neural Networks (SNNs) in Theano framework - this is one of the first implementation of SNN in any tensor-based framework.
- Spiking neural networks are biologically plausible neural networks which learn through Spike Time Dependent Plasticity (STDP) - an alternate to gradient descent.

Academic Projects

Multi-modal Medical Image Retrieval | *Tensorflow, Python* — Spring 2018 [Github]

- Developed a LDA based approach for visual feature extraction from medical images.
- Proposed novel early and late fusion techniques for fusing visual and textual features. Improved the state-of-the-art on ImageCLEF 2009 dataset and is published at **CoDS COMAD 2019**.

Suspicious Posture Recognition for Home Security | *Python, Java* — Spring 2018 [Github]

- Used Microsoft Kinnect to capture the skeletal features and a deployed classifier to detect suspicious postures.
- An Android app was built to notify the users when suspicious activities are detected. This work has been published at the IEEE INDICON 2018.

Traffic Sign Detection using YOLO Architecture | *Tensorflow, Python* — Spring 2018 [Github]

- Fine-tuned the YOLO network to detect traffic signs in the Belgium Traffic Sign Dataset.
- Modified the loss function to deferentially penalize large and small objects; this significantly improved the performance in traffic sign detection.

Software Development Project

Fund management software for purchase department, NITK | *PHP, SQL, HTML* — [Github]

- The application is designed to handle the formalities and procedures involved in managing the funds allocated for various projects.
- It is currently being used by the accountants at the purchase department of NITK.

Teaching / Research Assistant Experience

TA for Advanced Predictive Modelling - a graduate course by Prof. Joydeep Ghosh — Fall 2019
RA for Prof. Joydeep Ghosh - developing techniques for ML models to train on aggregated data. — Spring 2020

Publications

1. D Dennis, D Acar, **Vikram Mandikal**, V Sadasivan, V Saligrama, H Simhadri, Prateek Jain, " *Shallow RNN: Accurate Time-series Classification on Resource Constrained Devices*", Conference on Neural Information Processing Systems (NeurIPS), 2019
2. **Vikram Mandikal**, S Wolf, *"A GAN framework for Instance Segmentation using the Mutex Watershed Algorithm"*, Smooth Games Optimization & Machine Learning Workshop, Neural Information Processing Systems conference (NeurIPS) 2018, Accepted for Spotlight presentation.
3. **Vikram Mandikal**, A Anantharaman, Suhas B S and S Kamath, *"An Approach for Multi-modal Medical Image Retrieval using Latent Dirichlet Allocation"*, ACM India KDD CoDS-COMAD 2019 (Oral Presentation) · A short version accepted at the AI for Social Good Workshop, Neural Information Processing Systems conference (NeurIPS) 2018.
4. **Vikram Mandikal***, A Anantharaman*, Suhas B S*, Ashwin TS and RM Reddy, *"Kinect Based Suspicious Posture Recognition for Real-Time Home Security Applications"*, IEEE India Council International Conference (INDICON) 2018. * equal contribution

Academic Achievements and Awards

- Awarded Huawei Scholarship for Excellence for three consecutive years (2017-2019).
- Awarded the DAAD WISE fellowship to pursue a summer research internship in Germany.
- University Gold Medalist - Information Technology, Batch of 2019.
- Awarded National Talent Search Scholarship by NCERT. A national-level scholarship program in India to identify and recognize students with high intellect and academic talent.
- Qualified Regional Mathematics Olympiad (RMO) - among the thirty students who qualified in the state (Karnataka). RMO is a proof-based mathematics exam, equivalent to the AMC12 and AIME in the US.

Programming Skills

Deep Learning Frameworks:	TensorFlow, PyTorch, Theano
Languages and Scripts:	C++, C, Python, Java, HTML, CSS, Javascript, MySQL, Bash
Tools:	Android Studio, OpenGL, Flask, Git