

VIKRAM MURALI MANDIKAL

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EDUCATION

The University of Texas at Austin

Master of Science in Computer Science

Austin, Texas

Aug 2019 - May 2021 (Expected)

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

Research Intern | *Tensorflow, Pytorch*

Advisors: Dr. Harsha Simhadri and Dr. Prateek Jain

Bangalore, India

August 2018 to December 2018

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*

Advisor: Prof. Fred Hamprecht

Germany

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

Research Intern | *Theano, Python*

Bangalore, India

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 Kinect 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 differentially 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 EXPERIENCE

TA for Advanced Predictive Modelling - a graduate course by Prof. Joydeep Ghosh

Fall 2019

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.

RELEVANT COURSEWORK

Graduate coursework at UT Austin: Natural Language Processing, Numerical Analysis: Linear Algebra, Advanced Data Mining

Undergraduate coursework at NITK: Linear Algebra and Matrices, Soft Computing, Design and Analysis of Algorithms, Computer Vision, Information Retrieval, Semantic Web Technologies, Time Series Analysis

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