Hemanth **Kandula**

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Summary

CS graduate student and have 4+ years of experience applying deep learning methods to real-world challenges across different domains. Passionate in solving problems with AI, data science and robotics

Education

Tufts University *Medford, MA*

Master of Science in Computer Science with focus in AI *Aug. 2019 - May. 2021*

- *Relevant Coursework:* Reinforcement Learning, Natural Language Processing, Machine Learning, Big Data, Programming Languages, Parallel Computing, Algorithms

SASTRA University *Thanjavur, India*

Bachelor of Technology in Electronics and Communication Engineering *Jul. 2014 - May. 2018*

- *Bachelor Thesis:* Portable Internet-of-Things enabled rapid semen analysis system
- *Activities and Societies:* Engineering Project Coordinator at Robotics Club, Student Volunteer at National Service Scheme

Experience

Brigham and Women's Hospital, Harvard Medical School *Cambridge, MA*

Research Assistant - Machine Learning Research *Dec. 2017 - present*

- Worked with diverse team of clinicians and engineers in Dr. Hadi Shafiee's group solving problems in healthcare using Biotechnology and machine learning methods.
- Contributed to development and evaluation of novel Deep Learning and Healthcare research with 14+ journal and conference articles
- Research focused on unsupervised domain adaption, discriminative and generative models for medical imaging problems
- Developed and trained deep learning models with PyTorch, TensorFlow and Keras
- Developed various medical image data acquisition and annotation web/mobile apps for clinicians
- Deployed ML algorithms for software distribution in Android/Web applications.
- Helped building point-of-care biomedical devices and interfacing with embedded internet of things(IoT) systems and related smartphone apps

SASTRA University *Thanjavur, India*

App Developer *Aug. 2016 - Oct. 2017*

- Developed android applications for inter-college cultural festivals for participants and organizers at 300dpi, design Team of SASTRA University.

SASTRA University *Thanjavur, India*

Undergraduate Student Researcher; Advisor Prof. Manigandan. N.S *May. 2016 - Nov. 2017*

- Worked at Electric Vehicle Engineering and Robotics (EVER) Lab in projects mobile and aerial robots
- Reduced high cost Lidar sensors on CoroBot (mobile robot) using semantic segmentation for indoor autonomous navigation in ROS
- Worked on autonomous control of an unmanned multi-rotor (Quad-copter and tri-copter) GPS navigation for agricultural crop spraying

Relevant Skills

Programming/Scripting	Python, JAVA, SQL, C/C++, MATLAB, Bash, Linux
Tools/Frameworks:	PyTorch, Keras, TensorFlow, NumPy, Pandas, SKLearn, CUDA, Spark, Git, Spark, Docker, AWS, GCP
Machine Learning:	Domain adaption, Adversarial Learning, NLP, Reinforcement Learning, Regression, Classification, Clustering
Mobile/Web Frameworks	Android, Vue.js, Node.js, Flask, Node.js, Flask, REST API, Firebase, PostgreSQL, MongoDB, BigQuery

Selected Achievements

2019	**Full tuition scholarship,** from Brigham and Women's Hospital	*Cambridge, MA*
2018	**Grand Prize Award ,** MakeMIT-2018, Massachusetts Institute of Technology	*Cambridge, MA*
2019	**Winners,** Sharkhack 2019, Simmons University	*Boston, MA*
2017	**Winnerof Gauntlet challenge,** in DAKSH'17, SASTRA University	*Thanjavur, India*
2017	**Winner of Eleckart challenge,** in SHAASTRA'17(tech festival), Indian Institute of Technology-Madras	*Chennai, India*

Selected Research Projects

Adaptive Adversarial Neural Networks for Lossy and Domain-Shifted Medical Image Analysis

Machine Learning Researcher *May. 2019 – Nov. 2020*

- Investigated the use of adversarial learning on shifted medical image qualities.
- Designed & developed two state-of-the-art **unsupervised domain adaption** methods, first MD-nets, an adversarial adaptation method and another one is to perform DA without source data, a self-supervised pseudo-labeling module added to MD-nets

Classifying human embryo images for in-vitro fertilization(IVF)

Machine Learning Researcher, *Sep. 2020 – Dec. 2020*

- Embryo morphology assessments, conventionally performed through manual microscopic analysis suffer from disparities in practice, whichis crucial for success of an in-vitro fertilization (IVF)
- Evaluate multi-layered CNNs developed from scratch and popular deep-learning architectures such as Inception v3, ResNET-50, Inception-ResNET-v2, NASNetLarge, ResNeXt-101, ResNeXt-50, and Xception in differentiating between embryos based on their morphological quality at 113 h post insemination (hpi).

Domain Adaptation in Unmanned Aerial Vehicles Navigation & Obstacle Avoidance using Deep RL

Available on GitHub

Research project; Advisor: Prof. Jivko Sinapov *Sep. 2020 – Dec. 2020*

- Implemented a adversarial domain adaption method to retain knowledge different environments in indoor settings.
- Showed significant performance improvements over RL task learned from scratch and direct transfer learning

Cross-Lingual Sentiment Analysis via Conditional Language Adversarial Adaptation

Research project; Advisor: Prof. Bonan Min *Jan. 2020 – Aug. 2020*

- Developed conditional Language Adversarial Network (CLAN) which is designed to learn language invariant features that are also discriminative for sentiment classification.
- Showed that CLAN outperforms all previous methods for both in-domain and cross-domain CLSA tasks.

An inexpensive smartphone-based device for point-of-care ovulation testing

Research Assistant; Advisor: Prof. Hadi Shafiee *Jan. 2020 – Aug. 2020*

- A smartphone-based low-cost point-of-care diagnostics device to accurately predict ovulation at-home
- Developed with convolutions neural networks(CNN) and deployed into android application.

Mobile Health (mHealth) Viral Diagnostics Enabled with Adaptive Adversarial Learning

Available on GitHub

Machine Learning Researcher; Advisor: Prof. Hadi Shafiee *Jan. 2020 – Aug. 2020*

- Developed a smartphone-based viral detection(SARS-CoV-2, Zika, HIV, HBV HCV) system
- Created a data library by generating synthetic images with StyleGAN for all viral datasets
- Improved generalization by performed unsupervised adversarial learning with target pathogen and data library

Personal Projects

Shafieelab.bwh.harvard.edu

Link

Shafiee Laboratory Website *Jan 2019 – Apr 2019*

- Developed official website for Shafiee Laboratory. Developed the web app with Vue.js front end framework

Smart Cane for Visually Impaired

Link

MakeMIT 2018 Hackathon *Jan. 2018*

- This a Smart Cane is to help people with visual disabilities in indoor navigation.
- Build with the software stack of TensorFlow object detection API, SegNet (semantic segmentation) for detection and localization of objects and surfaces on a Nvidia Jetson TX2
- Integrated with haptic and audio feedback, a ultrasonic range sensor to give real-time feedback about the major irregularities on the ground.

Extracurricular Activity

Robotics Club, SASTRA University

Thanjavur, India

Core Member & Engineering Project Coordinator *Aug. 2015 - Oct. 2017*

- Reformed the society focusing on software engineering and building network on and off campus.
- Proposed various marketing and network activities to raise awareness.

National Service Scheme

Thanjavur, India

Student Volunteer *Sep. 2010 - Oct. 2011*

- The National Service Scheme (NSS) is a Central Sector Scheme of Government of India, Ministry of Youth Affairs & Sports. It provides opportunity to the students of India to take part in various government led community service activities & programmes.
- Participated on children education activities in local villages of Thanjavur.