MEGHANA PADMANABHAN

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OBJECTIVE: Detail-oriented problem solver with expertise in large-scale data analysis across diverse domains and creative application of Deep Machine Learning (ML) algorithms. Seeking a data scientist/software engineer position to expand ML expertise and apply known techniques to novel and impactful problems.

EDUCATION

University of Houston (UH), Houston, Texas
M.S. in Computer & Systems Engineering | GPA:3.97/4.0

R V College of Engineering, Bangalore, India
B.S. in Telecommunication Engineering | GPA: 9.1/10.0

WORK EXPERIENCE

HULA Ubiquitous Laboratory, University of Houston, Texas
Graduate researcher – Machine Learning and Computer Vision in Medicine | May 2019 – Present

Xurmo Technologies, Bangalore, India
Data Analytics Intern – Xurmo Big Data stack | Jan 2018 – April 2018

Indian Space Research Organization (ISRO), Bangalore, India
Engineering Intern – Satellite Automatic Identification Systems | Jan 2016 – May 2016

Indian Institute of Technology (IIT), Madras, India
Student Research Fellow – Department of Engineering Design | May 2015 – July 2015

RELEVANT PROJECTS

Chest X-ray image and report classification

HULA Ubiquitous Laboratory, University of Houston, Texas ***Jan 2019-Present***

- Worked on the OpenI Chest X-ray dataset classifying posterior and anterior X-ray scans into NLP generated disease categories.
- Performed pretraining of DenseNet121 (Pytorch Torchvision) model with domain-specific images to combat problems with small dataset.
- Performed data mining and web scraping to obtain disease names and symptom names from associated reports.
- Worked on improving accuracy of classification model using word vectors of patient symptoms before scans in addition to scan image by training multi-modal networks.
- Trained models to generate word vector embeddings and compared results with BERT embedding (BioBERT).
- **Software Tools / Libraries: Python, Pytorch, BERT, Beautiful Soup, cTakes**

MS Thesis: Physician Friendly Machine Learning: A case study with cardiovascular disease risk prediction (Publication)

HULA Ubiquitous Laboratory, University of Houston, Texas ***May 2019-July 2019***

- Worked on building the most accurate machine learning model using Scikit-learn for two cardiovascular disease risk prediction datasets.
- Applied range of simple to complicated models including Logistic Regression, Support Vector Machines with different kernels, Tree models, Ensemble models (boosting, bagging and voting) to find the most accurate and efficient model.
- Compared accuracy performance with Auto Scikit-learn, an AutoML system.
- Refinements using Proxy Auto Scikit-Learn with smaller sample size to cover a wider search space and obtain better fitting models.
- **Software Tools / Libraries: Python, Scikit-learn**

MS Thesis: Physician Friendly Machine Learning: ABMR classification model visualization (Publication)

HULA Ubiquitous Laboratory, University of Houston, Texas ***August 2019-October 2019***

- Worked on classifying kidney whole-slice images as having or not having Antibody Mediated rejection using a classification model and generating visualization maps to point to what the network 'sees' to pathologists.
- Used the ResNet50 classifier (used Pytorch TorchVision model and obtained a validation accuracy of 91.4% on unseen data)
- Worked with pathologists to check for correctness of model using visualization maps.
- **Software Tools / Libraries: Python, Pytorch, GradCAM**

Wearable seizure detection and communication system (Publication)

University of Houston, Texas ***October 2019-December 2019***

- Configured a Raspberry Pi processor to detect an event of seizure using inputs from motion sensor strapped to an epilepsy patient.
- Used Embedded Python to obtain samples from 3 axis accelerometer and designed algorithm to discern seizure events in patients.
- Configured the system to hold patient information in a cloud-based database (Google Firestore) and send notification to close ones when a seizure event is detected so as to enable swift action.
- **Software Tools / Libraries: Embedded Python, Raspberry Pi 3**

Improving ML algorithm performance for Xurmo Big Data platform

Xurmo Technologies, Bangalore, India ***January 2018-April 2018***

- Developed Scala code to add more evaluation metrices to Apache Spark's MLlib library for all ML algorithms in the library.
- Developed library module for feature selection (Chi-square, P-test)
- Developed testing framework to evaluate performance of newly written packages
- **Software Tools / Libraries: Scala, Apache Spark**

Receiver algorithm development for satellite-based Automatic Identification System (Publication)

Indian Space Research Organization, Bangalore, India ***January 2016-May 2016***

- Developed and compared receiver algorithms for nautical satellite-based AIS signal receivers.
- Used MATLAB to test performance (bit error rate) on simulated weather conditions.
- Tested algorithm on Space grade Virtex-5 FPGA.
- **Software Tools / Libraries: MATLAB, Embedded C**

Sensor data acquisition for vehicle mass detection

Indian Institute of Technology, Madras, India ***May 2015-July 2015***

- Conceptualized an effective system design for collecting sensor data from large vehicles.
- Proposed the use of suitable sensors, interface board, processor, GSM for the application.
- Proposed ideal communication standards for data transfer between components to processor.
- Researched suitable components available in the market to suit the proposed sensor data acquisition architecture.

SOFTWARE SKILLS

- Programming Languages: Python, C/C++, Cuda C, Embedded Python, Scala, SQL
- Software Libraries: Pytorch, Tensorflow, Keras, Scikit-learn
- Data Processing and Visualization Tools: Tableau, Microsoft Excel, Apache Spark

RELEVANT COURSE WORK

Machine Learning: Machine Learning (Stanford Online) **|** Convolutional Neural Networks (DeepLearning.ai) **|** Structuring Machine Learning Projects (DeepLearning.ai) **|** Neural Networks and Deep Learning (DeepLearning.ai) **|** Improving Deep Neural Networks: Hyperparameter Tuning, Regularization, and Optimization (DeepLearning.ai) **|** Advanced Machine Learning **|** Image Processing **|** Parallel Processing using GPUs **|**

Computer Systems and Networking: Advanced Computer Architecture **|** Advanced Hardware Architecture **|** Parallel Processing using GPUs **|** Principles of Computer Internetworking **|**

REFERENCES: Available upon request

***Visa Status**: F-1. Eligible to work without sponsorship on OPT.