Prahalathan Sundaramoorthy

linkedin.com/in/prahal-sundaramoorthy/ | prahalath27@gmail.com | (213) 284-9564 | github.com/prahalath

---

EDUCATION

University of Southern California - Viterbi School of Engineering   **January 2019-December 2020**
Master of Science in Electrical Engineering (Machine Learning)
Coursework: Probability, Linear Algebra, Pattern Recognition, Machine Learning, Deep Learning, Data Mining

Anna University   **June 2013-April 2017**
Bachelor of Engineering in Electrical and Electronics

TECHNICAL SKILLS

- **Languages:** Python, Java, C/C++, MATLAB, Bash
- **Tools:** NumPy, SciPy, Pandas, Apache Spark, Git
- **Data Visualization:** Matplotlib, Seaborn, Plotly
- **Deep Learning:** Keras, TensorFlow, PyTorch
- **Databases:** MySQL, MongoDB
- **Vision and Language:** OpenCV, NLTK, Spacy
- **ML and Statistics:** Scikit-learn, Statsmodels
- **Cloud Services:** AWS, GCP

WORK EXPERIENCE

Research Intern | HP Labs | Palo Alto   **May 2020-Present**
- Devised an end-to-end **Heart Rate** calculation model from Photoplethysmography (PPG) time-series sensor data in **Python.** Reduced mean error by **30%** through spectral filtering and peak validation; collaborated with production team for porting model to **C** for **release**.
- Achieved **80%** accuracy in predicting cognitive load of individuals through PPG wave morphology. Trained **1D Convolutional Neural Network** to capture shape of data from **450** participants on **AWS EC2**.
- Optimizing aforementioned models by integrating data from **Inertial Measurement Units**.

NLP & Deep Learning intern | Teknuance Info Solutions Pvt. Ltd | Chennai   **June 2018-August 2018**
- Examined **deep learning** techniques such as **seq2seq LSTMs**, **Word2Vec**, **GloVe**, etc. for performing **NLP** tasks -- text summarization, topic modeling on business data.

Research Assistant | Solarillion Foundation | Chennai   **April 2017-June 2018**
- Led a team of **four** to develop a **Human Activity Recognition** system from smartphone sensor data with **43 Million samples**. Tested various CNN and RNN ensembles and designed **HARNet.**
- Equipped **HARNet** with support for **on-device** incremental learning resulting in an increase in accuracy of **~35%** of least performing end-user.
- Devised a **low-cost** system for **Non-Intrusive Load Monitoring** on Raspberry Pi employing Ensemble Machine Learning (Extremely Randomized Trees) with inference time of **400ms** and **86%** accuracy.

PROJECTS

Active Learning using Bayesian Convolutional Neural Network
- Developed **ActiveHARNet**, a Bayesian Convolutional Neural Network capable of active learning to update model based on **real-time unlabelled data** for Human Activity Recognition.
- Trained model online and improved mean accuracy by **~25%** using **50%** incoming data.

Recommendation system on Yelp data
- Performed collaborative filtering with **MapReduce** technique to predict user ratings on products from Yelp data. Employed **Spark** framework for parallel processing and predicted ratings with RMSE of **1.176.**
- Created **NLP** pipeline to calculate **TF-IDF** scores on text data and built content-based recommender system to recommend similar products based on user history.

BFR Algorithm for large scale K-Means
- Implemented Bradley-Fayyad-Reina algorithm for distributed **K-Means** clustering on Yelp data using Python and Spark; obtained **90%** agreement with ground-truth clusters.

PUBLICATIONS
- Gautham Krishna Gudur, **_Prahalathan Sundaramoorthy_**, Venkatesh Umaashankar, **"**_ActiveHARNet: Towards On-Device Deep Bayesian Active Learning for Human Activity Recognition"_, **ACM MobiSys 2019**, 3rd International Workshop on Embedded and Mobile Deep Learning, Seoul, South Korea.
- Gautham Krishna Gudur, **_Prahalathan Sundaramoorthy_**, Venkatesh Umaashankar _"Handling Real-time Unlabeled Data in Activity Recognition using Deep Bayesian Active Learning and Data Programming"_, **MobiUK 2019, University of Oxford** [Extended Abstract].
- **_Prahalathan Sundaramoorthy_**, Gautham Krishna Gudur, Manav Rajiv Moorthy, R Nidhi Bhandari, Vineeth Vijayaraghavan, _"HARNet: Towards On-Device Incremental Learning using Deep Ensembles on Constrained Devices"_, **ACM MobiSys 2018**, 2nd International Workshop on Embedded and Mobile Deep Learning, Munich, Germany.
- A. K. Jain, S. S. Ahmed, **_P. Sundaramoorthy_**, R. Thiruvengadam, V. Vijayaraghavan, "Current peak based Device Classification in NILM on a low-cost embedded platform using Extra-trees," _2017 IEEE MIT Undergraduate Research Technology Conference (URTC)_, **_Massachusetts Institute of Technology, Cambridge, MA, 2017._**

AWARDS
- **First prize** among 50 participants in project exhibition **PROXPO 2016** organized by Velammal Engineering College, Chennai.
- **Runner up** in **Badminton** at the intramural sports competition among 8 departments conducted by Velammal Engineering College in 2016.

LANGUAGES:
- _Read, write, speak -_ English, Tamil
- _Speak -_ Hindi, Kannada