GAUTHAM KRISHNA GUDUR

Machine Learning Engineer & Independent Researcher

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EXPERIENCE

Machine Learning Engineer

SMARTCARDIA (EPFL)

May 2018 – Ongoing | Chennai, India

Currently developing insightful **machine learning, deep learning models** & **feature engineering** for analysis of various biomarkers in patients, thereby providing unique health insights. Frameworks mostly used: **Python**, **scikit-learn**, **TensorFlow**, **Weka**.

Research & Teaching Assistant

SOLARILLION FOUNDATION

Feb 2016 – July 2018 | Chennai, India

- Co-led a team of four to develop **Deep Learning** ensemble models for **Human Activity Recognition (HAR)** system on constrained devices.
- Developed a real-time **Occupancy Prediction engine** for a movie in collaboration with one of the **top 3 Indian movie multiplex chains**.
- Led a team of five and worked on a **Dynamic Gesture Recognition** system using accelerometers with Machine Learning approaches.
- Mentored students by helping them develop their problem-solving approaches in programming & embedded systems.

Undergraduate Student Researcher

SSN COLLEGE OF ENGINEERING

Feb 2015 – Mar 2017 | Chennai, India

- Worked on a funded HCI research project of **Neurocinematics**, where real-time cognitive responses of film viewers are captured using EEG.
- Worked on choosing the best-suited mote for two IoT scenarios, by analyzing their **RPL performance** metrics on a Contiki testbed.

PUBLICATIONS

Conferences

- Gautham Krishna Gudur, Prahalathan Sundaramoorthy, **"ActiveHARNet: Towards On-Device Deep Bayesian Active Learning for Human Activity Recognition"**, WristSense '19 workshop, @IEEE PerCom 2019 (Submitted).
- Gautham Krishna Gudur, Ateendra Ramesh, Srinivasan R, **"A Vision-based On-Device Scalable & Intelligent Bus Stop Recognition System"**, PerAwareCity '19 workshop, @IEEE PerCom 2019 (Submitted).
- 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"**, 2nd International Workshop on Embedded and Mobile Deep Learning (EMDL '18), @ACM MobiSys 2018.
- Gautham Krishna G, Karthik Subramanian Nathan, Yogesh Kumar B, Ankith A Prabhu, Ajay Kannan, Vineeth Vijayaraghavan, **"A Generic Multi-modal Dynamic Gesture Recognition System using Machine Learning"**, Future of Information and Communication Conference (IEEE FICC) 2018.

RESEARCH INTERESTS

Deep Learning | Ubiquitous Computing | Applied Machine Learning | Algorithms | Computer Vision | Active Learning | Physical Activity Sensing | IoT | Health-care Informatics | NLP

SKILLS

Programming

Expert Python | C/C++

Intermediate Java | SQL | HTML/CSS | JavaScript | Bash

Basic Android | R | Octave

Hardware & Software

Arduino | Raspberry Pi | LaTeX | Git | Linux | Windows

Tools & Frameworks

NumPy | Pandas | TensorFlow | Keras | Scikit-learn | PyTorch | OpenCV | NLTK | PySpark | Flask | Weka | AWS

EDUCATION

B.Tech in Information Technology

Anna University

Grad. Apr 2017 | Chennai, India

Cum. GPA: 7.41/10 - First Class

HSC (Class XII)

DAV Higher Secondary School, Gill Nagar

Grad. May 2013 | Chennai, India

Scored an overall of 94.25%

REFEREES

Vineeth Vijayaraghavan
Director, Solarillion Foundation
Dr. Srinivasan Murali
CEO, SmartCardia SA, EPFL
Prof. Srinivasan R
Professor, SSN College of Engineering
Prof. Bhalaji N
Assoc. Prof., SSN College of Engineering

- Gautham Krishna G, Krishna G, Bhalaji N, **"Electroencephalography Based Analysis of Emotions Among Indian Film Viewers"**, Advanced Informatics for Computing Research, Springer, ICAICR 2017.
- G Gautham Krishna, G Krishna, N Bhalaji, **"Analysis of Routing Protocol for Low-power and Lossy Networks in IoT Real Time Applications"**, Procedia Computer Science, Elsevier, ICRTCSE 2016.

Poster

- N Bhalaji, G Krishna, G Gautham Krishna, **"Neurocinematics: The Intelligent Review System."**, 3rd International Conference on Cognition, Brain and Computation (CBC 2015), Indian Institute of Technology (IIT), Gandhinagar.

NOTABLE PROJECTS

Intelligent Bus Stop Recognition System

Undergraduate Thesis, SSN College of Engineering

Jan 2017 – Apr 2017

Tools & Framework: Python | Numpy | TensorFlow | Raspberry Pi
Developed an embedded vision-based bus stop recognition engine, using **ConvNets** & **hybrid nearest-neighbor classifiers**. **Data augmentation**, **Incremental Learning** and **Bayesian Active Learning** strategies were simulated for bus-stop scalability.

Movie Occupancy Prediction Engine

Solarillion Foundation

Sep 2017 – Mar 2018

Tools & Framework: Python | Pandas | MS-SQL | scikit-learn | Keras
Dealt with terabytes of transactional data ($\sim$5 years), structured them and extracted behavioral features to forecast the movie occupancy (± 6 MAPE) using statistical **time-series algorithms** and **Recurrent Neural Nets**. Deployed the beta application into production.

Machine Learning/Deep Learning Projects

Online Coursework, Kaggle, Personal

May 2017 – Ongoing

Tools: Python | Numpy | scikit-learn | OpenCV | TensorFlow | GraphLab
Projects and datasets like: • **TamilNIST**: Live Tamil Character Recognition • CIFAR-10, notMNIST, Image Captioning, Text8- Wikipedia • Machine Learning MOOC projects & assignments. Kindly visit my **Github page** for all implementations.

OTHER PROJECTS

YOLO Object Detector: Developed an object recognition module using **YOLO v3**, **OpenCV** and **PyQt5**, that provides accurate real-time bounding boxes on images & videos with confidence scores.

Active Learning & GANs for Incremental Data Imbalance: Currently working on **Bayesian active learning** strategies and utilizing **GANs** as an alternative for data augmentation in sensor & image data, thereby **handling class data imbalance** during incremental learning.

Real-Time Sentiment Analyzer of Twitter Trends: Implemented an application using **NLTK** and **scikit-learn** to graph the real-time Twitter mood trend (pos/neg) using **ensemble voting** and **TextBlob classifier**.

COURSEWORK

Undergraduate

- Programming & Data Structures: I & II
- Operating Systems
- Database Management Systems
- Design & Analysis of Algorithms
- Artificial Intelligence
- Compiler Design
- Data Warehousing & Data Mining
- Data Analytics

Online Certifications & MOOCs

- **University of Washington | Coursera**
  Machine Learning Specialization (4 courses) | A Case Study Approach | Regression | Classification | Clustering & Retrieval
- **Stanford University | Coursera**
  Machine Learning
- **UC-San Diego | Coursera**
  Algorithmic Toolbox | Data Structures
- **John Hopkins University | Coursera**
  R Programming
- **Google | Udacity** - Deep Learning
- **Stanford University** - CS231n
- **fastai** - fastai

HONORS & AWARDS

Scholastic

- **97th percentile in HackerRank (Algorithms Domain)**
- Undergraduate **Financial Research Grant of INR 24,000** by College Management
- Certification of Merit for Grade A1 in all subjects in AISSE
- Top 10 percentile in 42nd National Mathematics Talent Competitions

Non-Scholastic

- Event Organizer of "Data Nuggets" - a Data Science event, Invente2k16
- Completed all 10 levels of UCMAS Mental Arithmetic (Abacus)
- Division/State Badminton Player (U-19)
- 29th Rank overall in Grade 3 Keyboard