# GAUTHAM KRISHNA GUDUR

## Machine Learning Engineer & Researcher


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## EXPERIENCE

### Machine Learning Engineer

**Lumos Labs/SmartCardia SA**

May 2018 – Ongoing | Chennai, India

Currently working on developing insightful machine learning models and engineering features for real-time tracking and analysis of various biomarkers in patients, thereby providing unique health insights.

### Research & Teaching Assistant

**Solarillion Foundation**

Feb 2016 – July 2018 | Chennai, India

- Co-led a team of four to develop a Human Activity Recognition (HAR) system robust to mobile-sensing heterogeneities using Deep Learning.
- Developed a real-time Occupancy Prediction engine for a show in collaboration with one of the top 3 movie multiplex chains in India.
- 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 approach towards problem-solving and taught them fundamental concepts in programming and 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

- 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"**, IEEE FICC 2018.
- 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.

## RESEARCH INTERESTS

Machine Learning | Deep Learning | Data Science | Internet-of-Things | Computer Vision | NLP | HCI | AI in Health-care | Cognitive Computing | Pervasive & Ubiquitous Computing

## SKILLS

### Programming

**Expert** Python | C/C++

**Intermediate** R | Java | HTML/CSS | JavaScript | PHP | Bash | SQL

**Basic** Android | Go

### Hardware & Software

Arduino | Raspberry Pi | LaTeX | Git | Linux Distros | Contiki OS | Octave

### Tools & Frameworks

NumPy | Pandas | TensorFlow | Keras | PyTorch | scikit-learn | OpenCV | NLTK | 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** - vineethv@ieee.org
Director, Solarillion Foundation

**Prof. Srinivasan R** - srinivasanr@ssn.edu.in
Professor, SSN College of Engineering

**Prof. Bhalaji N** - bhalajin@ssn.edu.in
Assoc. Professor, SSN College of Engineering

### 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

### Movie Occupancy Prediction Engine

**Solarillion Foundation**

Sep 2017 – Mar 2018

**Tools & Framework: Python | Pandas | MS-SQL | scikit-learn | PyTorch**
Extracted terabytes of transactional data (app. 5 years), structured them using MS-SQL & engineered behavioral features to forecast show occupancy of a movie ($\pm 6$ MAPE). Was a core part of the team that deployed the beta application into production.

### Intelligent Bus Stop Recognition System

**Undergraduate Thesis, SSN College of Engineering**

Jan 2017 – Apr 2017

**Tools & Framework: Python | Numpy | TensorFlow | Raspberry Pi Zero**
Developed an embedded recognition engine that automatically identifies bus stops using images acquired from cameras placed atop a bus using a lightweight hybrid nearest-neighbor classifier and ConvNets. Currently working on Generative Networks (GANs) and Active Learning for data augmentation and scalability of bus stops.

### Machine Learning/Deep Learning Projects

**Online Coursework, Kaggle, Personal**

May 2017 – Ongoing

**Tools: Python | Numpy | scikit-learn | PyTorch | TensorFlow**

- TamilNIST: Live Tamil Character Classification (CV)
- Grasp-and-Lift EEG Detection from Kaggle (HCI)
- CIFAR-10, MS-COCO, notMNIST, Image Captioning (CV & NLP)
- Text8 - Wikipedia (NLP)
- Machine Learning Specialization Course Projects

## OTHER PROJECTS

**Gest-Face:** Developed a Gesture/Facial recognition system rendered as an application using PyQt5 and OpenCV, that can recognize simple hand gestures, as well as detect faces of users in real-time.

**Real-Time Sentiment Analyzer of Twitter Trends:** Implemented an application using NLTK and scikit-learn to graph the live Twitter trend of an incoming keyword using ensemble voting and TextBlob classifier, thereby presenting a real-time mood (pos/neg) of the scraped tweets.

**Speed Control of DC Motor using Arduino:** Devised a closed loop Proportional controller algorithm with feedback mechanism using Arduino to automatically self-stabilize the error between reference and measured speed ($\pm 4$ RPM) of a 12V DC Motor with external load.

## 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

## HONORS & AWARDS

### Scholastic

- **97$^{th}$ 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 42$^{nd}$ National Mathematics Talent Competitions

### Non-Scholastic

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