

# GAUTHAM KRISHNA GUDUR

Data Scientist | Independent Researcher | Applied ML/DL | Ubiquitous Computing

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## EXPERIENCE

### Data Scientist

#### ERICSSON R&D - GLOBAL AI ACCELERATOR (GAIA)

📅 Feb 2019 – Ongoing    📍 Chennai, India

- Currently working on Machine Learning for Network Intelligence broadly in the space of telecom and IoT.
- Working on projects like time-series anomaly detection, red-cell detection during busy hours, failure prediction of Mean Time to Connect (MTTC), etc. for various mobile, broadband service providers.
- Developing an open-source anomaly detection framework for ease of access to existing/novel algorithms for data scientists, stakeholders.

### Machine Learning Engineer

#### SMARTCARDIA (EPFL)

📅 May 2018 – Nov 2018    📍 Chennai, India

- Developed insightful machine learning, deep learning models for analyzing biomarkers like Sleep apnea, Troponin, Hemoglobin, Blood Pressure, Glucose, to provide unique insights into patients' health.
- Engineered features for imbalanced time-series clinical data, and modeled classification, regression architectures using tree-based ensembled models and Recurrent neural networks (LSTMs).

### Research & Teaching Assistant

#### SOLARILLION FOUNDATION

📅 Feb 2016 – June 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 Movie Occupancy Prediction engine 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 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/Workshops

- **Gautham Krishna Gudur**, Prahalathan Sundaramoorthy, Venkatesh Umaashankar, "ActiveHARNet: Towards On-Device Deep Bayesian Active Learning for Human Activity Recognition", 3rd International Workshop on Embedded and Mobile Deep Learning (EMDL '19), ACM MobiSys 2019.

## RESEARCH INTERESTS

Applied Machine Learning/Deep Learning  
Ubiquitous/Wearable Computing  
Activity Recognition    On-Device ML  
Bayesian ML    Active Learning    IoT  
Sensor-based HCI    Time-series Analysis  
Computer Vision    NLP    Healthcare

## SKILLS

### Programming

Expert Python    C/C++  
Intermediate Java    SQL    HTML/CSS  
JavaScript    Bash  
Basic Android    R    Octave

### Hardware & Software

LaTeX    Git    Arduino    Raspberry Pi

### 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  
Thesis: Intelligent Bus Stop Recognition System [Supervisor: Prof. Srinivasan R]

### Courses

Programming & Data Structures: I & II  
Design & Analysis of Algorithms  
Artificial Intelligence    Signal Processing  
Operating Systems    Data Analytics  
Data Warehousing & Data Mining

### HSC (Class XII)

#### DAV Higher Secondary School, Gill Nagar

📅 Grad. May 2013    📍 Chennai, India

Scored an overall of 94.25%

- 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", Springer, Future of Information and Communication Conference (IEEE FICC 2018).
- Gautham Krishna G, Krishna G, Bhalaji N, "Electroencephalography Based Analysis of Emotions Among Indian Film Viewers", Springer, International Conference on Advanced Informatics for Computing Research (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.

## Posters/Extended Abstracts

- 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].
- 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 [Poster].

## NOTABLE PROJECTS

\* Work to be submitted at

### Incremental Federated Learning for Ubiquitous Sensing

Working on incremental/continual learning for time-series and ubiquitous sensing tasks across devices in a federated learning setting wherein, the neural network continually updates on-the-fly with new incoming real-time activities, whilst retaining previously learned information (handling catastrophic forgetting) [\* IMWUT/UbiComp].

### Weak Supervision for Sensor Label Generation

Working on leveraging heuristic data labeling functions which are fed into a generative model and fine-tuned by a discriminative model - a weakly supervised data programming paradigm, aimed at ground truth generation for mobile, wearable sensing tasks [\* UbiComp CPD '19].

### Intelligent Bus Stop Recognition System [Undergraduate Thesis]

Developed an vision-based bus stop recognition engine deployed on a RaspberryPi, using ConvNets & hybrid nearest-neighbor classifiers. Utilized data augmentation and incremental Bayesian Active Learning strategies for bus-stop scalability [\* UbiComp PURBA '19].

### Movie Occupancy Prediction Engine [Solarillion Foundation]

Structured and extracted behavioral features from terabytes of transactional time-series data (~5 years) to forecast the movie occupancy ( $\pm 6$  MAPE) using tree-based ensemble models and Recurrent neural nets. Deployed the beta application into production.

### Competitions/Challenges

- Sussex-Huawei Locomotion Challenge (SHL 2019) - Activity Recognition [\* UbiComp HASCA '19].
- GermEval 2019 - Shared task on hierarchical classification of German blurbs [\* KONVENS '19].

Kindly visit my website/GitHub for an exhaustive list of projects

## MOOCS

- **University of Washington | Coursera**  
Machine Learning Specialization (4 courses)  
A Case Study Approach   Regression  
Classification   Clustering & Retrieval
- **NRU HSE | Coursera**  
Bayesian Methods for Machine Learning
- **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** - Deep Learning for Coders

## HONORS & AWARDS

### Scholastic

- 97<sup>th</sup> percentile in HackerRank (Algorithms Domain)
- Undergraduate Financial Research Grant of INR 24,000 from SSN College of Engineering
- Technical Reviewer of the book titled "Hands-On Meta Learning With Python."
- Certification of Merit for Grade A1 in all subjects in AISSE
- Top 10 percentile in 42<sup>nd</sup> 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)

## REFEREES

**Dr. Srinivasan Murali**

📍 CEO, SmartCardia, EPFL

**Dr. Arjuna Sathiaseelan**

📍 CEO, Gaius Networks; Ex Director, N4D Lab, University of Cambridge

**Vineeth Vijayaraghavan**

📍 Director, Solarillion Foundation

**Prof. Srinivasan R**

📍 Professor, SSN College of Engineering