GAUTHAM KRISHNA GUDUR

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📍 Chennai, India   🔗 gauthamkrishna-g.github.io   🜲 github.com/gauthamkrishna-g   </> hackerrank.com/gauthamkrishna_g

EXPERIENCE

Data Scientist
ERICSSON R&D - GLOBAL AI ACCELERATOR (GAIA)

📅 Feb 2019 – Ongoing   📍 Chennai, India

- Incorporating Machine Learning for Network Intelligence broadly in the space of telecom and IoT.
- Currently working on *iSite (Intelligent Site Acceptance)* – **on-mobile object localization/segmentation** to automate close out package for fault tolerance at cell sites, time-series anomaly detection, failure prediction of Mean Time to Connect (*MTTC*) for service providers.
- Developing an **open-source anomaly detection framework - qudditch**, with a focus existing/novel Machine Learning unsupervised algorithms, metrics, explainability, visualization, etc.

Independent Researcher

📅 Dec 2018 – Ongoing   📍 Chennai, India

- Currently working on **Bayesian Incremental/Continual Learning** on the edge to handle *catastrophic forgetting,* by leveraging *data distillation* for audio/HAR tasks. (Collaborating remotely with *Bell Labs/Oxford* and *Cambridge*)) [*IMWUT/UbiComp].
- Working on **Federated Learning** across devices using *Knowledge Distillation* to handle multiple *heterogeneous architectures* which continually update themselves with focused loss functions in audio tasks. [*ICASSP 2020].
- Worked on incremental updation of incoming unlabeled data on-device using **Bayesian Active Learning** for Human Activity Recognition and Fall detection tasks.

Machine Learning Engineer
SMARTCARDIA (EPFL)

📅 May 2018 – Nov 2018   📍 Chennai, India

- Developed machine learning, deep learning models for analyzing **biomarkers** like Sleep apnea, Troponin, Haemoglobin, Blood Pressure, Glucose, to provide unique insights into patients' health.
- Engineered features for imbalanced time-series clinical data, and modeled classification, regression architectures using *Gradient-Boosted ensemble 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 novel deep learning ensemble models for heterogeneous **Human Activity Recognition (HAR)** tasks on resource-constrained devices capable of incremental model updation.
- Developed a **Movie Occupancy Prediction** engine for a top 3 Indian movie multiplex chain, using tree-based ensemble models and Recurrent neural nets. Deployed the beta application into production.
- Led a team of five and designed a user-independent on-device **Dynamic Gesture Recognition** system using accelerometers with Machine Learning approaches.
- Mentored over 7 students by helping them develop their problem-solving approaches in programming and embedded systems.

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*Work in Progress, to be submitted at

RESEARCH INTERESTS

Applied Machine Learning/Deep Learning
Ubiquitous/Wearable Computing
Activity Recognition   On-Device ML
Healthcare   Bayesian ML   IoT
Continual Learning   Active Learning
Computer Vision   NLP   HCI

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. *Advised by* 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%

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

Undergraduate Student Researcher
SSN COLLEGE OF ENGINEERING
📅 Feb 2015 – Mar 2017　　　📍 Chennai, India

- Developed an on-device vision-based *Intelligent Bus Stop Recognition System* using ConvNets, utilized data augmentation, Incremental Bayesian Active Learning strategies for bus stop scalability and adaptability to dynamic Indian bus stop environments.
- 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

👥 Conference/Workshop

- Sundararaman V, Ateendra Ramesh, Sharan Sundar S, Aashish Kumar Jain, <u>Gautham Krishna Gudur</u>, Vineeth Vijayaraghavan, **"A Dynamically Adaptive Movie Occupancy Forecasting System with Feature Optimization"**, *IEEE ICDM 2019* - Workshop on Learning and Mining with Industrial Data (*LMID '19*).
- Raghavan A K, Venkatesh Umaashankar, <u>Gautham Krishna Gudur</u>, **"Label Frequency Transformation for Multi-Label Multi-Class Text Classification"**, *KONVENS 2019* - GermEval Workshop 2019.
- <u>Gautham Krishna Gudur</u>, Ateendra Ramesh, Srinivasan R, **"A Vision-based Deep On-Device Intelligent Bus Stop Recognition System"**, *ACM UbiComp 2019* - 8th International Workshop on Pervasive Urban Applications (*PURBA '19*).
- <u>Gautham Krishna Gudur</u>, 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 (*EMDL '19*).
- Prahalathan Sundaramoorthy, <u>Gautham Krishna Gudur</u>, 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 (*EMDL '18*).
- <u>Gautham Krishna G</u>, 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 Future for Information and Communication Conference (*FICC 2018*).
- <u>Gautham Krishna G</u>, Krishna G, Bhalaji N, **"Electroencephalography Based Analysis of Emotions Among Indian Film Viewers"**, Springer, International Conference on Advanced Informatics for Computing Research (*ICAICR 2017*).
- <u>G Gautham Krishna</u>, 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/Extended Abstract

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

HONORS & SERVICES

Honors and Awards

- Undergraduate **Financial Research Grant of INR 24,000** from SSN College of Engineering
- *Winner* of *GermEval* Shared Task 1 Challenge (Subtask (a)), KONVENS 2019 in Post-Evaluation Phase
- **97th percentile in HackerRank (Algorithms Domain)**
- Certification of Merit for Grade A1 in all subjects in AISSE
- Top 10 percentile in 42nd National Mathematics Talent Competitions
- Completed all 10 levels of UCMAS Mental Arithmetic (Abacus)
- Division/State Badminton Player (U-19)

Services

- **Reviewer** - Machine Learning for Health Workshop (**ML4H 2019**), **NeurIPS 2019**
- **Reviewer, PC Member** - GermEval 2019, KONVENS 2019
- Technical Reviewer of the book titled **"Hands-On Meta Learning With Python"**
- Event Organizer of "Data Nuggets" - a Data Science event, Invente 2016

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

NOTABLE PROJECTS

Data Programming 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 [*TBD].

Movie Occupancy Prediction Engine [Solarillion Foundation]
Structured and extracted behavioral features from terabytes of transactional time-series data ($\sim$5 years) to forecast the movie occupancy (±6 MAPE) using tree-based ensemble models and Recurrent neural nets. Deployed the beta application into production.

Gest-Face
Developed a Gesture & Facial recognition application using OpenCV and PyQt5, that can accurately recognize simple hand gestures, as well as detect faces of users using in real-time.

Speed Control of DC Motor using Arduino
Devised a feedback based Proportional controller algorithm to self-stabilize the error between reference and measured speed (±4 RPM) of a 12V DC Motor with external load.

Competitions/Challenges
- Winner of *Subtask (a) – GermEval 2019* - Shared task on hierarchical classification of German blurbs **[KONVENS '19]**.
- Emteq Human Activity Recognition **[UbiComp '19]**.

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

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

Dr. Srinivasan R
 Professor, SSN College of Engineering

Dr. Bhalaji Natarajan
 Assoc. Prof., SSN College of Engineering

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