

GAUTHAM KRISHNA GUDUR

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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 *on-mobile video object localization/segmentation* 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 on-device *Bayesian Incremental/Continual Learning* to handle *catastrophic forgetting*.
- Worked on incremental updation of incoming data on-device using *Bayesian Active Learning for Human Activity Recognition*.

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 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

- 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.

RESEARCH INTERESTS

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

PUBLICATIONS

Conferences/Workshops

- Sundararaman V, Ateendra Ramesh, Sharan Sundar S, Aashish Kumar Jain, **Gautham Krishna Gudur**, 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)*.
- **Gautham Krishna Gudur**, 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)*.
- **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 (EMDL '19)*.
- 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 (EMDL '18)*.
- **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 Future for Information and Communication Conference (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, ICRTCS 2016*.

Posters/Extended Abstracts/Challenges

- **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].
- **Gautham Krishna Gudur**, Venkatesh Umaashankar, "Human Activity Recognition using Chained and Dilated Deep Convolutional Neural Networks", *Emteq Activity Recognition Challenge, ACM UbiComp 2019 [Challenge]* (Submitted).
- Raghavan A K, Venkatesh Umaashankar, **Gautham Krishna Gudur**, "Label Frequency Transformation for Multi-Label Multi-Class Text Classification", *GermEval 2019 Task 1 – Shared Task on Hierarchical Classification of Blurbs, KONVENS 2019 [Challenge]*.
- 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].

HONORS & SERVICES

Honors

- **Winner** of GermEval Shared Task 1 (Subtask (a)) Challenge, KONVENS 2019 in Post-Evaluation Phase
- **97th 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 42nd National Mathematics Talent Competitions
- 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)

Services

- **Reviewer, PC Member** - GermEval (GEST19.1), KONVENS 2019

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

* Work in Progress, work to be submitted at

Incremental Federated Learning for Ubiquitous Sensing

Working on ubiquitous sensing tasks across devices in a federated learning setting to handle multiple heterogeneous neural networks which continually update themselves, using Binary Neural Networks and Knowledge Distillation [* *Federated Learning Workshop, NeurIPS; The Web Conference (WWW 2020)*].

Bayesian Incremental/Continual Learning on the Edge

Working on on-device incremental/continual learning wherein, the neural network continually updates on-the-fly with new incoming real-time activities, whilst retaining previously learned information (handling *catastrophic forgetting*), and robust to model uncertainties using Bayesian Neural Networks [* *IMWUT/UbiComp*].

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*].

Competitions/Challenges

- Emteq Human Activity Recognition [* *UbiComp '19*].
- GermEval 2019 - Shared task on hierarchical classification of German blurbs [*KONVENS '19*].

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

REFEREES

Dr. Srinivasan Murali

📍 CEO, SmartCardia, EPFL

Dr. Arjuna Sathiseelan

📍 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