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Srihari Maruthachalam

With a blend of 5 years in Data Science, 3 years in research, and 2.5 years in software engineering, there is a refined mastery of Machine Learning. This proficiency propels the development of innovative solutions using Deep Learning and Machine Learning algorithms, providing answers to complex real-world issues. A history of significant growth underlines this expertise.

Professional Experience

Jun 2022 - Present **Staff Data Scientist**, *Netradyne Technology India Pvt ltd*, Bangalore

Contributed to a safety initiative by developing XGBoost (XGB) and LightGBM (LGBM) models to classify potential collisions using an inertial and visual data stream. The models, trained on signal processing features, use a trigger point from the inertial jerk. Achieved a recall over 96% and a precision over 95% for potential collision class the on edge. Further enhanced by a Deep Neural Network (DNN) model on the cloud, increasing the recall by an additional 2%.

• Edge computing • Multiclass Classification • Deep Neural Network • PyTorch • XGB • LightGM

Implemented a fuel-saving initiative by developing a neural network (NN) model that utilized inertial and GPS features to identify vehicle idling for every minute, despite unreliable GPS data. When prolonged idling is detected, audio feedback is played in real-time (RT) to prompt the driver to switch off the engine. This model achieved a 76.3% F1 score in production and has been estimated to contribute to the environment by reducing ∼150 tons of CO_2 emissions monthly.

• Neural Network • Binary Classification

Pioneered a safety initiative by developing a threshold-based method to identify hard braking instances, an indicator of reckless driving, using speed and inertial data streams. By leveraging existing visual models, this approach also determines the causes of hard braking in RT. This critical information forms the basis of a coaching program, which has reduced driver distraction by 67%, enhancing overall road safety.

• Real-time Analysis.

Apr 2020 - Jun 2022 **Data Science Associate Consultant**, *ZS Associates*, Bangalore

Developed a BERT transformer model to diagnosing rare diseases, addressing challenges in healthcare due to misdiagnosis and delayed treatment. The model was trained on administrative claims datasets comprising patient-level claims data, diagnosis codes, procedures, and medications. This approach achieved a test AUPRC of 96.8%, outperforming the baseline XGB and LSTM models, which scored 79% and 80.1%, respectively.

• Transformer • Python • LSTM • PU Learning

Developed a genetic algorithm for feature selection in machine learning. The algorithm selects initial feature sets, evaluates their fitness, and selects the best-performing ones for the next generation. It then creates new feature sets through crossover and mutation and evaluates their fitness. The algorithm adds (non-)linear transformations of the features with the highest importance score and randomly picked features in each iteration to improve the feature selection. The algorithm continues until the best feature set is found and used to train machine-learning models.

• XGB • Feature engineering

Contributed to a healthcare initiative by developing an XGB model to predict if oncology patients would progress to the next stage within six months, using insurance claims data as features. Further enhanced this predictive model by building a Convolutional NN (CNN) version that processed a matrix of claims and prescriptions over time. This model outperformed the initial XGB model by an absolute 13.7% in AUPRC.

• CNN • PyTorch

Led the development of an OLS model to identify the most effective sales channel for a pharmaceutical company's drug sales, considering various channels. This model was regionalized to understand specific influences and achieved an R^2 value of 0.76.

• OLS • Residual Analysis

Jul 2019 - Feb 2020 **Project Associate**, *Indian Institute of Technology, Madras*, Chennai

Developed an Android app for Automated Speech Recognition, converting indic speech into text, in collaboration with Electrical Engineering and Computer Science departments.

Led the creation of an Android app translating eye blinks into speech using a single-channel remote EEG, revolutionizing communication for individuals with speech and movement limitations.

Formulated the SEAT project, a graph matching algorithm mapping student preferences to course enrollment, optimizing the process by considering class capacity and prerequisites.

• Java • Python • Git • ASR • Neural Network

Dec 2016 - Jun 2019 **Research Assistant**, *Indian Institute of Technology, Madras*, Chennai
Half-Time Research Assistantship (HTRA) funded by MHRD, India
Leveraged my expertise in the field to serve as a Research and Teaching Assistant for two courses: Introduction to Programming and Pattern Recognition. For each course, I managed comprehensive course curation, effectively resolved student queries, orchestrated question paper creation, and steered the evaluation process.
• Numpy • PyTorch • MATLAB • Git • LaTeX

Aug 2014 - Jan 2017 **Programmer Analyst**, *Cognizant Technology Solutions India Pvt Ltd.*, Chennai
As a full-stack developer, significant contributions were made in developing a workflow management system for a US insurance company, a web publishing application, and a job monitoring system. These systems improved service ticketing, deployment processes, and job monitoring, saving approximately 50 human hours monthly.
• ASP.Net MVC 4 • Entity Framework • jQuery • MS SQL Server 2008 • SVN • IIS 8

Educational Qualifications

2016 - 2020 **Indian Institute of Technology**, *Madras*, MS by Research in Computer Science and Engineering, 8.0/10

2010 - 2014 **Anna University**, *Chennai*, B.Tech. Information Technology, 8.2/10

Publications

EMBC 2019 **Srihari Maruthachalam**, Mari Ganesh Kumar, and Hema A Murthy, *Time Warping Solutions for Classifying Artifacts in EEG* 2019 41st Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC) 2019, Germany

Interspeech 2018 **Srihari Maruthachalam**, Sidharth Aggarwal, Mari Ganesh Kumar, Mriganka Sur, and Hema A Murthy, *Brain-Computer Interface using Electroencephalogram Signatures of Eye Blinks.* Proc. Interspeech 2018, 1059-1060, Hyderabad, India

Selected Courses

Credited • Introduction to Research • Kernel Methods for Pattern Analysis • Speech Technology • Advanced Data Structures & Algorithms • Linear Algebra and Random Processes • Pattern Recognition

Audited • Deep Learning • Computational Models of Cognition

Scholastic Achievements

GATE 2016 Top 1.5% among all the candidates

Conference and Workshop Attended

IEEE Engineering in Medicine and Biology Society (EMBC) 2019, Germany

Centre for Computational Brain Research 2019, IIT Madras

Interspeech 2018, Hyderabad

Neuromorphic Computing Workshop 2018, IISc Bangalore

Centre for Computational Brain Research 2018, IIT Madras

Brain Modes 2017, National Brain Research Centre, New Delhi

Recent Awards at Netradyne

Dec 2024 Aspire leadership programme

Oct 2024 Netradyne Information Security Ambassador (NISA)

Dec 2023 Netradyne Dream Team