Chaitree Sham Baradkar

MSc Cognitive Science student – Machine Learning

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Self-motivated, **curious**, and **hard-working** student pursuing **MSc in cognitive science** with research interest in **Artificial Intelligence and Cognitive Neuroscience and their interaction.** I have 4+ years of professional experience in **Machine Learning**, **Convolutional Neural Networks** for perception systems in self-driving cars, **Time Series Analysis**, and predictive modeling using text data.

Technical Skills

- Programming Languages - **Python**, C++, SQL, R
- Neural Networks - Convolutional Neural Networks (CNN), Long Short Term Memory (LSTM)
  - Successfully completed DeepLearning.AI *Deep Learning Specialization* from Coursera.org.
- Deep Learning Frameworks - Caffe, Tensorflow, Keras
- Others - OpenCV, GIT, ROS (Robot Operating System), Linux, Psychtoolbox (MATLAB), Behavioral Data Analysis, FSL for neuroimaging.

Work Experience

- **Tata Elxsi, Bangalore, Senior Engineer, R&D, Autonomous Vehicle Program** (July, 2016 - June, 2019)

- Researched, trained, and tested Object Detection and Classification, Lane Detection modules using CNNs like **Single Shot MultiBox Detector, SqueezeDet, LaneNet** to outperform existing computer vision algorithms.
- Performed data collection, annotation and preparation, transfer learning and prepared **end-to-end inference** pipeline of developed Object Detection and Classification module to achieve targeted accuracy on Indian Road Datasets.
- Developed, deployed, tested, and fine-tuned our own **weighted multi-CNN traffic Sign Recognition module** that achieved a **recognition rate of 99.5%**. Published a research paper in IET Intelligent Transport Systems journal in 2018.
- Optimized the developed CNN algorithms for NVIDIA GPU platforms to improve the execution time and memory requirement.
- Received **Project Excellence Award for Autonomai (IP Initiative)** for January, 2017 – December, 2017.

- **Internship, Indian Institute of Technology Delhi, (Dr. Sumeet Agarwal and Dr. Varsha Singh)** (May, 2022 - July, 2022)

- Automatically predicting the movement execution ratings of spinal cord injury (SCI) patients using machine learning to reduce human bias while evaluating the performance. We used CNNs like **OpenPose and MoveNet** for keypoint detection in each video frame and sent keypoint timeseries features as input to various algorithms like SVM, linear regression, etc. to predict movement execution ratings. We found that the Machine Learning model reliably predicted the average ratings of two or three raters, compared to predicting the individual ratings of the human raters. Presented the poster at the 9th Annual Conference of Cognitive Science in 2022.

- **PharmaACE, Pune, Data Scientist** (July, 2019 - May, 2021)

- Developed, trained, and tested different algorithms such as **XGBoost, SVM, and LSTMs** to accurately predict the progression in line of treatment in patients using medical claims data.

- Worked with a diverse team to deploy a **time series forecasting tool** into production to forecast the demand for drug volume using Machine Learning and Statistical Algorithms like **XGBoost, CNNs, LSTMs, ARIMA, exponential smoothing, Holt-Winters**, etc. for significant cost savings in the inventory.
- Delivered a novel proof of concept that categorizes drug markets using algorithms for **time series clustering like KMeans, KMedoids, self-organizing maps, etc.** on historical sales data.
- Provided comprehensive analyses for the ad-hoc queries using different datasets of medical claims.
- Mentored internship project in parameter optimization for statistical time series forecasting algorithms.

Academic Details

Year	Degree / Board	Institute	GPA / Marks (%)
2023	M.Sc. in Cognitive Science	Indian Institute of Technology Delhi	9.3
2016	B.Tech. in Electronics and Communication Engineering	Visvesvaraya National Institute of Technology, Nagpur	8.67

Publications

- Natarajan, S., Annamraju, A. K., & Baradkar, C. S. (2018). *Traffic sign recognition using weighted multi convolutional neural network.* IET Intelligent Transport Systems, 12(10), 1396–1405. https://doi.org/10.1049/iet-its.2018.5171
- Baradkar, C., Ganveer, A., Lokhande, S., & Surender, K. (2016). *Fuzzy Approach for Examining the Performance of Driver.* International Journal of Advanced Research in Computer and Communication Engineering, 5(7), 663–666. https:// doi.org/10.17148/IJARCCE.2016.57132

Poster Presentation

- "Predicting hand-raise movements using machine learning: Implications for reducing rating-bias of upper limb movement in Spinal Cord Injury (SCI)". 9th Annual Conference of Cognitive Science (ACCS9). IIT Delhi, India, December 2022.

Extra-Curricular Activities

- Volunteer, Lead Machine Learning Engineer, Omdena (AI for World Impact) (December, 2020 - May, 2021)