PEMMASANI PRABAKARAN Rohith Saai

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EDUCATION

Master of Science (M.Sc.) in Artificial Intelligence

Universiteit van Amsterdam **Sep 2023 – Aug 2025**

- Graduated ***Cum Laude*** with **GPA 8.2/10**
- Relevant Courses: Machine Learning 1 & 2, Information Retrieval 1, Causality, Natural Language Processing 1, Computer Vision 1 & 2, Reinforcement Learning, Stochastic Simulation.
- **Thesis**: Zero-shot Multivariate Time-Series Forecasting with Transformer-based Bayesian Prior-Fitted Networks. (**graded 8.5/10**)

Bachelor of Engineering (B.Eng.) in Bioengineering, Minor in Computer Science

City University of Hong Kong **Sep 2016 – Feb 2021**

- Graduated ***First Class Honors*** with **GPA 3.72/4.3**
- **Thesis**: Early detection of Alzheimer's Disease in Mild Cognitive Impaired patients using deep learning on metabolite biomarkers derived from Chemical Exchange Saturation Transfer (CEST) MRI data. (**graded A+**)

RESEARCH EXPERIENCE

WAIR – Retail Geeks, The Netherlands **Jan 2025 – Jul 2025**

AI Intern

- Developed a **structural causal model–driven framework** to **generate** diverse and realistic **synthetic time-series**, enabling effective pretraining, improved generalization, and reduced data scarcity.
- Designed a **Transformer-based foundational model** for **zero-shot multivariate forecasting**, approximating Bayesian posterior predictive distributions (PPD) via neural networks to **handle out-of-distribution and data-sparse** scenarios. Applied to fashion retail demand forecasting.
- Achieved **state-of-the-art zero-shot forecasting performance** on **benchmark datasets** by leveraging **in-context** learning with structurally related time-series.

Centre for Cerebro-Cardiovascular Health Engineering, Hong Kong **Apr 2021 – Aug 2023**

Research Assistant

- Developed a deep learning-based **super-resolution framework** to **accelerate MRI acquisitions**, enhancing image quality and **reducing scan times by up to 50%.**
- Designed a **lightweight CNN-based neural network** that **outperformed UNet** on super-resolution tasks **using 33% fewer parameters**, optimizing for spatial reconstruction efficiency under compute constraints.
- The work contributed to a **peer-reviewed publication (NMR in Biomedicine, 2024).**

Department of Biomedical Engineering, City University of Hong Kong **Sep 2019 – May 2020**

Final Year Thesis

- Developed a **fully connected neural network** to **detect early-stage Alzheimer's Disease** in mild cognitive impairment (MCI) patients using **metabolite biomarkers** derived from CEST MRI data.
- Applied curve-fitting techniques to preprocess spectral data and extract physiologically relevant features for supervised learning.
- Focused on modelling and classifying temporal-spectral patterns from imaging data, enabling a non-invasive, data-driven approach to early neurodegenerative diagnosis.

WORK EXPERIENCE

Braillic Limited, Hong Kong **Aug 2022 – Aug 2023**

ML Consultant

- Built an **AI pipeline** to reconstruct **3D brain models from 2D MRI scans**, enabling faster and more reliable brain region analysis for clinical and research use.
- Developed a **segmentation system** that accurately **detected and labelled anatomical structures**, powering Augmented Reality (AR)-based visualization tools for medical training and diagnostic support.

PROJECTS

DAVOS – Diffusion-based Auto-Vocabulary Segmentation

- Developed a **segmentation framework** that leverages **BLIP vision-language model** to **generate object masks and labels for unlabelled images**, enabling large-scale training without manual annotation.
- Integrated BLIP embeddings and varied grounding strategies (Grounded-SAM, LISA, BCC) to guide segmentation across diverse and noisy input conditions.

Studying How to Efficiently and Effectively Guide Models with Explanations – A Reproducibility Study

- Reproduced and extended the findings of Rao et al. (ICCV 2023), which evaluated model guidance through explanation-based loss functions for interpretable deep learning.
- Proposed **X-SegEPG**, a more robust **evaluation metric for attribution localization**, and **Energy* loss** to **normalize against bounding box size bias**, contributing methodological innovations for fairer model evaluation.
- Investigated robustness to sparse and noisy supervision and the role of contextual information in classification, reinforcing insights on data-efficient generalization and out-of-distribution behavior.

JOURNAL PUBLICATIONS

- **Pemmasani Prabakaran RS**, et al. "Deep-learning-based super-resolution for accelerating chemical exchange saturation transfer MRI." NMR in Biomedicine (2024): e5130. **Featured on the journal cover**.
- **Pemmasani Prabakaran RS,** et al. "Studying How to Efficiently and Effectively Guide Models with Explanations" - A Reproducibility Study. Machine Learning Reproducibility Challenge 2023. **Presented at NeurIPS 2024**.

CONFERENCE PRESENTATIONS

- **Pemmasani Prabakaran RS,** et al. "Single-offset and multi-offset super-resolution for CEST MRI using deep transfer learning". ISMRM & SMRT Annual Meeting & Exhibition, Digital Poster, No.3847 (2022)
- **Pemmasani Prabakaran RS,** et al. "Multi-offset super-resolution for accelerating CEST MRI acquisition using deep-transfer learning". 9th International Workshop on Chemical Exchange Saturation Transfer Imaging. Digital Poster (2022)

HONORS AND AWARDS

- **Conference Grant, University of Amsterdam** **2024**
  - Awarded travel funding to attend and present at NeurIPS 2024
- **Third Place, Outstanding Scholars in Cardiovascular Engineering, Hong Kong** **2022**
  - Recognized for research excellence in cardiovascular health engineering.
- **MBE Department Outstanding Student Award, City University of Hong Kong** **2018**
  - Awarded to top-performing students for academic and leadership excellence.
- **Dean's List, City University of Hong Kong** **4 semesters**
  - Awarded for achieving a semester GPA above 3.7 on a 4.3 scale
- **Full Tuition Scholarship, City University of Hong Kong** **2016 – 2020**
  - Merit-based scholarship covering full tuition worth 13500 € per year.

TEACHING & LEADERSHIP EXPERIENCE

Teaching Assistant, University of Amsterdam **Jan 2025 – Mar 2025**

Reinforcement Learning

- Led two weekly tutorial sessions on reinforcement learning concepts, facilitating problem-solving through worksheets in groups of 20 students to practice concepts introduced in lectures.
- Provided hands-on support with weekly assignments, addressing both theoretical questions and practical challenges in algorithm implementation.

Fairness, Accountability, Confidentiality, and Transparency in AI

- Mentored four student groups on reproducibility studies of top-tier conference papers, each selected for their alignment with the course themes.
- Guided replication of results and exploration of additional findings and improvements, culminating in successful submissions to the Machine Learning Reproducibility Challenge (MLRC) 2025.

Treasurer, Student Residence of City University of Hong Kong **Aug 2018 – Jul 2020**

- Prepared a comprehensive Hall budget exceeding € 10,000 and Annual Plan for the academic years 2018/2019 and 2019/2020.
- Coordinated with the university's Finance Office and conducted due diligence on financial reports and transactions

SKILLS

Programming Languages	Python, C++, MATLAB, SQL, Bash/Linux scripting
Tools & Frameworks	PyTorch, Apache Spark, Git, PowerBI, FastAPI, Flask