Shivaanee Eswaran

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Education

- **Indian Institute of Technology Madras** — Zanzibar, Tanzania
  Master of Technology - Data Science and Artificial Intelligence; GPA: (ongoing) — *Oct 2024 - June 2026*
  Courses: *Deep Learning, NLP, Maths for Data Science, Programming & Data Structures, Data Analytics, Engg. Analytics, Big Data*
  Thesis: *Uncertainty Estimation in Deep Learning*
- **Heriot-Watt University** — Edinburgh, UK
  Bachelor of Science (Hons) - Computer Science; Rank: Upper Second Class — *Sep 2021 - June 2024*
  Courses: *Data Mining and Machine Learning, Conversational Agents and Spoken Language Processing, Data Visualisation and Analytics, Statistical Modelling and Analysis, AI and Intelligent Agents, Intelligent Robotics, Data Structures and Algorithms*
  Dissertation: *Comparison of Recommendation Algorithms through development of a Book Recommender Web App*
- **Gems Modern Academy** — Dubai, UAE
  High School Diploma (ISC Curriculum); Score: 95% — *March 2021*
  Courses: *Mathematics, Computer Science, Physics, Chemistry, English*

Experience

- **Walmart Center for Tech Excellence** — Remote
  Research Assistant — *Nov 2024 - Feb 2025*
  - **Inventory Management Optimisation:** Developing an AI-based optimisation framework integrating Physics-Informed ML, Reinforcement Learning, and Generative AI to minimize inventory management costs.
  - **Machine Learning & Statistical Modelling:** Using Python and R to build models and analyze data effectively.
- **Flydubai** — Dubai
  IT Corporate & Support Intern — *Sep - Oct 2024*
  - **Asset Reconciliation:** Managed a backlog of over 500 tickets, documenting ticket details and any discrepancies.
  - **Automation of Reconciliation Process:** Proposed automation for repetitive and manual processes. Successfully completed the data extraction component, and redesigned data forms for cleaner data in future.
  - **Data Visualisation:** Created visualisations in Power BI to communicate asset use.
  - **Impact:** Enhanced the efficiency of asset tracking, and set a departmental record by imaging 31 laptops in a day.
- **Heriot-Watt University** — Edinburgh
  Lab Assistant — *Sep 2022 - Apr 2024*
  - **Java, Python, SQL, HTML, CSS:** Supported software development and web design & databases courses.
  - **Student Engagement:** Helped over 100 students understand course material, marked assignments, provided feedback, and contributed to assessment strategy discussions.

Research & Projects

- **Uncertainty-Guided Perceptual Quality Assessment of AI-Generated Images (Uncertainty Estimation, Deep Learning, Computer Vision):** Proposed a novel uncertainty-aware probabilistic framework that models perceptual quality separately across image styles and combines predictions based on classification confidence, achieving state-of-the-art results. *Accepted at Women in Computer Vision (WiCV), CVPR 2025.*
- **Impact of Narratives on Human-Robot Interaction (NLP, GPT-3.5, Python, R, Kotlin):** Led an 8-member team in a research study on the impact of narratives on human-robot interactions using a Furhat robot and GPT-3.5, conducting data analysis in Python and R, implementing the desired robot behavior in Kotlin, and building the virtual environment in Minecraft. *Poster paper published at Human-Agent Interaction (HAI) 2024.*
- **AI Mathematical Olympiad (Python, LLMs (Qwen, DeepSeek, Phi), Prompt Engg.):** Developed an AI model for solving complex International Math Olympiad (IMO) problems requiring step-by-step reasoning and deep understanding of mathematical concepts.
- **Predicting Metabolite Concentrations from NIR Spectral Data (Python, R, Machine Learning):** Near-infrared (NIR) spectroscopy is a non-destructive and non-invasive analytical technique. Used NIR spectral data to predict metabolite concentrations with models such as Ridge and PLS regression, Elastic Net, LASSO, and neural networks and identified significant spectral features. Incorporated labeled and unlabeled data using self-training, pseudo-labeling, and autoencoders.
- **COVID-19 Vaccination Effectiveness Visualization (D3.js, Javascript, HTML, CSS):** Led a data visualization project on a COVID-19 vaccination dataset, ensuring data accuracy for over 50,000 records using Pandas and NumPy, and developed an interactive dashboard with diverse visualizations using HTML, CSS, JavaScript, and D3.

Awards

- Recipient of 50% Merit Scholarship (Undergrad) - September, 2021
- 3x Champion at IPA National Abacus Competition - 2015, 2016, 2017