Atri Vivek Sharma

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EDUCATION

Imperial College London Centre for Doctoral Training in Safe and Trusted Artificial Intelligence **2023 – 2027**
Ph.D. Computer Science
Research Focus on Formal Verification and Robust Learning of Decision Tree Ensemble Algorithms

Imperial College London **2017 – 2021**
M.Eng. Aeronautical Engineering *First Class Honours (78%), Dean's List*
Thesis on Machine Learning for Composite Airframe Design. Investigated the application of Multi-Layer Perceptron and Gradient Boosting models as surrogate models for optimizing layups of composite stiffened panels

EXPERIENCE

Safe Intelligence Ltd. **London, UK**
Machine Learning Research Engineer *Nov 2023 – Present*

- Pioneered research in formal verification of safety properties for machine learning models.
- Leading the robustness verification and learning initiatives for decision tree ensembles (e.g., XGBoost).
- Developed a novel gradient boosting algorithm that displays improved robustness and stability to adversarial evasion attacks (minor imperceptible input variations), relevant for applications in safety critical domains such as fraud detection, loan approvals, and trading.
- Developed a novel method to evaluate robustness of regression models using a Mixed-Integer Linear Programming solver (Gurobi).
- Defined robustness specifications for tabular financial data, ensuring reliability and compliance for automated loan approval models.

Pangaea Data Ltd. **London, UK**
Product Engineer – Natural Language Processing *July 2021 – Sep 2023*

- Led a cross-functional NLP and Product team to conceptualize, research, and implement an end-to-end ML pipeline that leveraged advanced text mining and predictive modelling techniques on patient health records.
- Applied state-of-the-art NLP methods (transformer-based models, semantic similarity, topic modelling) and deployed ML solutions at scale on Microsoft Azure to identify at-risk patients for a clinical trial with a major pharmaceutical partner.
- Collaborated closely with clinicians and stakeholders to iteratively refine research objectives, validate clinical relevance, and ensure robust empirical evaluation of model performance.
- Authored technical proposals, research grant submissions, and internal white papers that integrated recent research findings, bridging the gap between cutting-edge academic literature and industry applications.
- Represented the company at the Accenture FinTech Innovation Lab 2022, demonstrating domain-transferable ML techniques and securing a proof-of-concept in financial risk assessment.
- Employed a wide array of programming tools (Python, PyTorch, Docker, JavaScript, React) and research best practices to translate complex computational methods into scalable, production-ready solutions.

Lumitics **Singapore**
Lead Product and Hardware Engineer *May 2018 – Sep 2018*

- Led the end-to-end hardware design and optimization cycle for an IoT-based food waste analytics device, integrating sensor data collection and automated data processing workflows.
- Employed iterative prototyping and data-driven design improvements—relying on feedback loops from customers, engineers, and manufacturers—to significantly reduce unit costs by 30% and increase mechanical reliability from fewer than 100 to over 5,000 operational cycles.
- Established rigorous testing protocols and reliability analysis frameworks to ensure robust performance in dynamic real-world environments, effectively translating user requirements into quantifiable engineering metrics.

PUBLICATIONS

Jingqing Zhang, Atri Sharma, Luis Bolanos, Tong Li, Ashwani Tanwar, Vibhor Gupta, Yike. A scalable workflow to build machine learning classifiers with clinician-in-the-loop to identify patients in specific diseases.

PROJECTS

ICAV Project Team Lead **Oct 2018 – Jul 2020**

- Directed a 25-member interdisciplinary team to design, manufacture, and test a fully autonomous UAV for the iMechE UAS Challenge 2020, earning commendations for Best Design and Safety & Airworthiness.
- Engaged with the Department of Aeronautics, sponsors, and partner organizations to secure project funding, and consulted with academics and industry experts to refine the UAV's design and manufacturing methodologies.
- Led the mechanical design and fabrication of the payload delivery system and tailplane structure, integrated UAV electronics, and programmed the PixHawk-based autonomous flight system for robust and reliable operations.

OpenVaccine Challenge: COVID-19 mRNA Vaccine Degradation Prediction **Sep 2020 – Oct 2020**

- Developed a deep sequence-to-sequence model using GRUs in TensorFlow to predict the degradation of COVID-19 mRNA vaccines.
- Performed data preprocessing, feature extraction, and hyperparameter tuning to build a robust predictive model, contributing to global efforts in improving vaccine design and stability analysis.

TEACHING

Undergraduate Teaching Assistant, ICL **Oct 2020 – Jun 2021**

- Guided a cohort of 30 students through Mathematics and Structural Analysis course material, reinforcing foundational theories and advanced problem-solving techniques.
- Conducted interactive revision sessions, facilitated Q&A discussions, and developed practice exercises to strengthen students' conceptual understanding and improve overall academic performance.