

MINAL SURESH PATIL

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EDUCATION

Umeå Universitet

Ph.D., Computer Science (Research: Formal Methods and Machine Learning)

Sep. 2020 – Sep. 2024

Umeå, Sweden

University College London

MSc., Data Science

Sep. 2018 – Sep. 2019

London, UK

R.V. College of Engineering

B.E., Computer Science

Sep. 2011 – Sep. 2015

Bengaluru, India

EXPERIENCE

Scania CV AB

Senior Research Engineer (Formal Methods × Generative AI)

Sep. 2024 – present

Södertälje, Sweden

Propinquity Labs

Data Scientist

June 2016 – Sep. 2019

Bengaluru, India

- Developed machine learning models to analyze satellite imagery, improving land classification accuracy by 15%.
- Implemented deep learning architectures for object detection in aerial imagery, reducing manual annotation time by 40%.
- Developed a cloud-based pipeline to efficiently handle terabytes of imagery and vector data for model training and inference.

Sensus Labs

Data Scientist

Sep. 2015 – June. 2016

Bengaluru, India

- Developed deep learning models to estimate user location from smartphone sensor data, improving accuracy by 25%.
- Implemented Extended Kalman Filters (EKFs) to fuse data from inertial sensors, Wi-Fi, and Bluetooth beacons for seamless indoor navigation.
- Optimized EKFs through fine-tuning, improving positioning accuracy by 30% and reducing latency by 20%.

INTERNSHIP

Scania CV AB

PhD Research Intern

February 2024 – July 2024

Södertälje, Sweden

- Lead the development of a framework for generating secure C code, known as `spec2code`, designed to meet both formal and informal specifications using Large Language Models.

Virgin Media





MSc Research Intern

May 2019 – August 2019

London, UK

- Developed a halo-forecasting model using data from over 100,000 customers, achieving 88.4% accuracy and increasing conversion rates by 15% through targeted up-selling strategies.

PUBLICATIONS

- M.S. Patil, Gustav Ung, Mattias Nyberg. Towards Specification-Driven LLM-Based Generation of Embedded Automotive Software.** In *2nd Artificial Intelligence International Symposium On Leveraging Applications of Formal Methods, Verification and Validation (AISoLA)*, 2024
- M.S. Patil and Kary Främling. Enhancing Vulnerable Class Robustness in Adversarial Machine Learning.** In *IEEE World Congress on Computational Intelligence (IEEE-WCCI): International Joint Conference on Neural Networks (IJCNN)*, 2024
- M.S. Patil and Kary Främling. Investigating Lipschitz Constants in Neural Ensemble Models to Improve Adversarial Robustness.** In *Proceedings of 7th International Conference on System Reliability and Safety (IEEE-ICSRS)*, 2023 
- M.S. Patil and Kary Främling. Improving Neural Network Verification Efficiency through Perturbation Refinement.** In *32nd International Conference on Artificial Neural Networks (ICANN)*, 2023 
- M.S. Patil and Kary Främling. Do Intermediate Feature Coalitions Aid in the Explainability of Black-Box Models?.** In *1st World Conference on eXplainable Artificial Intelligence (XAI)*, 2023 
- M.S. Patil. Explainability in Autonomous Pedagogically Structured Scenarios.** In *Workshop on Explainable Agency in Artificial Intelligence at 36th Association for the Advancement of Artificial Intelligence (AAAI)*, 2022 

TECHNICAL SKILLS

Languages: C++, Python, OCaml, Rust, SQL

Verification Tools: Lean and Coq (proof assistants), Frama-C, Dafny

Technologies/Frameworks: PyTorch, TensorFlow, Vertex AI, GCP, Docker, Kubernetes