

Servinar Cheema

PhD Candidate | Safety Verification & Validation of Automated Driving Systems | University of Edinburgh

servinar.cheema@ed.ac.uk | servinar.com | [LinkedIn](https://www.linkedin.com/in/servinar) | [GitHub](https://github.com/servinar)

RESEARCH PROFILE

PhD candidate at the University of Edinburgh's Centre for AI in Assistive Autonomy, building safety verification and validation (V&V) frameworks for autonomous driving systems (ADS): scenario generation for safety-critical edge cases, machine-evaluable behaviour rulebooks, and closed-loop testing of black-box driving systems, producing traceable, and causal evidence. Currently testing generative AI methods for sensor data synthesis.

EDUCATION

- School of Informatics, University of Edinburgh** Sept 2023 - Present
PhD in Informatics: Safety Verification & Validation of Automated Driving Systems Scotland, United Kingdom
 - Centre for AI in Assistive Autonomy [🌐], Institute of Perception, Action and Behaviour [🌐].
 - Advisors:** Prof. Subramanian Ramamoorthy & Dr. Craig Innes. **Focus:** scenario-based testing, behaviour rulebooks, and closed-loop V&V for safety-critical ADS.
- School of Mathematics, University of Southampton** Graduated 2022
MMath with Statistics, First Class (Hons) England, United Kingdom
 - Master's thesis on Gaussian Processes for supervised ML in computer vision (supervised by Dr. Jon Cockayne);
 - Dean's List Award for Outstanding Achievement. Foundation in statistical inference, optimisation, and linear algebra.

SKILLS

- Programming & Tooling:** Python, C++, R, Julia, Git, Docker.
- ML & Scientific Computing:** PyTorch, TensorFlow, JAX, CUDA, SciPy, Gurobi, CasADi, Stable Baselines.
- Robotics & Simulation:** ROS, ROS2, Autoware, CARLA, Waymax, OpenSCENARIO/OpenDRIVE.
- Verification & Scenario Testing:** Scenic, temporal logic (STL/LTL), SMT solvers (Z3), runtime monitoring.

EXPERIENCE

- Dragonfly Labs** [🌐] Aug 2022 - June 2023
Machine Learning Specialist (formerly ML Intern, 2019–20) United Kingdom
 - Advanced autonomous-trading research from proof of concept to fully automated, resilient models handling real-time market data and live-trend forecasting.
 - Implemented deep reinforcement learning to adapt strategies online, improving predictive accuracy and validating reliability through extensive simulation and statistical testing.
- MINDS CDT** [🌐] July - Sept 2020
Research Intern Remote
 - Engineered a distributed AlexNet across Raspberry Pi and PC nodes over MQTT, applying DNN model-splitting to improve inference efficiency without sacrificing accuracy.

CONFERENCES & WORKSHOPS

- IEEE Intelligent Vehicles Symposium (IV 2026)** Detroit, MI · June 2026
Attending the flagship IEEE ITSS intelligent-vehicles forum; tracking ADS safety, V&V, and scenario-based testing. [🌐]
- 3rd Human-Centered VRU Simulation Workshop** Leeds, UK · March 2024
Pedestrian safety and behaviour analysis in the HIKER immersive pedestrian lab. [🌐]
- Probabilistic Numerics Summer School** Southampton, UK · April 2024
Uncertainty quantification for state estimation and PDE solvers. [🌐]

LEADERSHIP, TEACHING & OUTREACH

- Organiser**, Google Developer Student Club, Southampton (2021–22): ML/TensorFlow & Flutter workshops for 200+ attendees.
- President**, Southampton University Mathematics Society (2020–21): events, budgeting, and staff liaison through the pandemic.
- Mentor**, Prewired / Digital Skills 4 Girls (2024–present): coding, robotics, and FIRST LEGO League coaching.
- Teaching:** Assistant Course Director, Bucksmore Education (2023); Academic Support, Univ. of Southampton (2020–22).

Languages: English (native); French (intermediate).