# Erfan Aasi

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## Education

**M.I.T,** Cambridge, MA — Spring 2024 – Now
*Postdoctoral Associate in Computer Science, Supervisor: Daniela Rus*

**Boston University,** Boston, MA — Fall 2018 – Fall 2023
*M.S. and Ph.D. in Mechanical Engineering, Supervisor: Calin Belta* — *GPA: 3.87/4.00*

**Sharif University of Technology,** Tehran, Iran — Fall 2013 – Summer 2018
*B.Sc. in Electrical Engineering* — *GPA: 3.60/4.00*

## Research Interests

- Safe autonomy
- Deep learning and language models
- Interpretable decision-making
- Time-series analysis and prediction

## Experience

**Postdoc Researcher,** Computer Science, MIT — Jan. 2024 – Now
- Developing robust autonomous systems by integrating deep learning and language models.
- Enabling common-sense reasoning in autonomous vehicles using language models.

**Machine Learning Intern,** Symbotic — Sep. 2022 – May 2023
- Developed anomaly detection methods for the time-series behavior of ground warehouse robots.
- Provided data manipulation and integration frameworks for high-level maintenance decision makings.

**Graduate Research Assistant,** Boston University — Dec. 2018 – Dec. 2023
- Designed motion planning and control algorithms for safe, efficient urban driving.
- Leveraged machine learning methods to infer temporal properties for interpretable decision-making.

## Projects (latest)

**ReGen: Generative Robot Simulation via Inverse Design** (ICLR 2025 - accepted)
- Proposed a framework using LLMs to automatically generate simulation environments from agent behaviors.
- Enabled controllable, counterfactual scenarios for robust robot policy testing.

**Generating Out-Of-Distribution Scenarios Using Language Models** (ICRA 2025 - accepted)
- Developed a framework using LLMs to generate and simulate diverse OOD scenarios in autonomous driving.
- Assessed Vision-Language Models for interpreting and navigating the generated OOD scenarios.

**Control Algorithm for Autonomous Driving in Uncertain Environments** (T-ITS 2024 - accepted)
- Developed a control method for self-driving cars in uncertain environments, subject to safety and traffic rules.
- Improved runtime performance and solution quality, compared to existing works.

**Deep Reinforcement Learning for Continuous Control in Cluttered Environments** (IROS 2023 - accepted)
- Proposed a deep policy gradient control algorithm for a robot with unknown dynamics in a cluttered environment.
- Designed a reward scheme, using sampling based methods, to overcome the exploration challenges.

**Time-Incremental Learning from Data Using Temporal Logics** (L4DC 2023 - accepted)
- Proposed a temporal logic-based classification method for time-series data in an incremental learning framework.
- Leveraged decision trees and neural networks to minimize the misclassification rates.

**Classification of Time-Series Data using Boosted Decision Trees** (IROS 2022 - accepted)
- Developed a decision-tree based approach for data classification using temporal logic specifications.
- Improve runtime performance and misclassification rate over existing approaches.

## Technical Skills

**Coding**: Python (expert), PyTorch (expert), Matlab (intermediate), C++ (beginner)
**Language Models**: Pretraining, Fine-tuning, RAG, Prompt Engineering
**Machine Learning**: LLMs, Deep Neural Networks, Decision Trees, LSTM, CNN, GAN
**Developer Tools**: SQL, ROS, Git, Shell
**Databases**: Snowflake, Tableau, Azure Microsoft
**Simulators**: CARLA, AirSim, Gazebo, CoppeliaSim