Vignesh Subramanian

Atlanta, Georgia, USA

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EDUCATION

Georgia Institute of Technology   **Aug 2023 - Ongoing**
Ph.D. - Computer Science | 2nd Year   Atlanta, Georgia
Advisor - Prof. Suguman Bansal

National Institute of Technology, Tiruchirappalli   **Aug 2019 - April 2023**
B.Tech. - Electrical and Electronics Engineering   Tiruchirappalli, Tamil Nadu
Minor - Computer Science Engineering

Relevant Coursework: Logic in Computer Science, SAT/SMT solvers, Machine Learning and Deep Learning, Software Analysis and Testing, Artificial Intelligence, Data Structures and Algorithms

PUBLICATIONS

Inductive Generalization in Reinforcement Learning from Specifications
ArXiv Preprint, 2024
Vignesh Subramanian, Rohit Kushwah, Subhajit Roy, Suguman Bansal   **[Link]**

Inductive Generalization in Reinforcement Learning from Specifications (Short Paper)
NeurIPS - Workshop on Generalization in Planning 2023
Rohit Kushwah, **Vignesh Subramanian**, Subhajit Roy, Suguman Bansal   **[Link]**

Reinforcement Learning for Stochastic Max-Plus Linear Systems
Conference on Decision and Control, IEEE 2023
Vignesh Subramanian, Farzaneh Farhadi, Sadegh Soudjani   **[Link]**

A Novel Facial Emotion Recognition Model Using Segmentation VGG-19 Architecture
International Journal of Information Technology, Springer, 2023
Vignesh Subramanian, Savithadevi, M. Sridevi, Rajeswari Sridhar   **[Link]**

SIHeDA-Net: Sensor to Image Heterogeneous Domain Adaptation for Sign Language Detection
Medical Imaging with Deep Learning, 2022
Ishikaa Lunawat, **Vignesh Subramanian**, S P Sharan   **[Link]**

In Preparation:

CertRLGen: Certification-Guided Evaluation of Reinforcement Learning Generalization
Vignesh Subramanian, Djordje Zikelic, Suguman Bansal

TEACHING EXPERIENCE

Graduate Teaching Assistant - SAT/SMT Solvers   **Fall 2024**
Georgia Institute of Technology   *Atlanta, Georgia*
- Guiding students on advanced topics in SAT and SMT solvers, supporting projects in model checking, symbolic execution, neural network verification, and providing technical assistance for assignments related to formal verification, solver architecture, and proof complexity.

INTERNSHIPS

Newcastle University, United Kingdom | Paper link   **Jan 2022 - Nov 2022**
Research Intern - Mentor: Prof. Sadegh Soudjani   *Newcastle, England*

- Proposed a novel optimization strategy using Deep Q-Learning for Stochastic Max-Plus-Linear Discrete Event Systems under uncertainties, achieving a 2.5x speedup over Model Predictive Control for minimizing stochastic delays in railway systems, published at **Conference on Decision and Control, IEEE, 2023**.

Samsung R&D Institute, Bangalore | Report link   **Aug 2021 - Feb 2022**
Research Intern - Mentor: Mr. Sujoy Saha, Mr. Rajat Kumar Jain   *Karnataka, India*

- Developed a Tri-Stage Occlusion Handling Normal Map Estimation Algorithm to enhance 3D human normal map estimation on blurred, noisy, low-res 2D images, achieving 92.78% IoU (vs. 71.26% baseline) by effectively addressing occlusions from shadows, blur, and background.

National Institute of Technology, Tiruchirappalli | Paper link | Github link   **Feb 2021 - Dec 2021**
Research Intern - Mentor: Prof. M. Sridevi   *Tamil Nadu, India*

- Designed a novel CNN architecture integrating U-Net and VGG layers for Facial Emotion Recognition, achieving 75.97% accuracy on the FER-2013 dataset, ranking in the **Top 5** on the global leaderboard. Findings were published in the **International Journal of Information Technology, Springer**.

TECHNICAL SKILLS

- **Languages**: C/C++, Python, Java, Javascript, Lean

- **Packages/Frameworks**: Pytorch, Tensorflow, Keras, Scikit-learn, OpenCV, OpenAI Gym, Stable Baselines

- **Reinforcement Learning**: Policy Gradient Methods, Generalization Algorithms, Safety Certificates for RL, Reachability and Safety Analysis

- **Formal Verification**: Static Analysis, Model Checking, Formal Methods for Safety Verification, Path-Insensitive and Context-Sensitive Reachability Analysis

POSITIONS OF RESPONSIBILITY

Reviewer   **2025**
AAAI - Workshop on Generalization in Planning

- Selected to serve as a reviewer for the AAAI Workshop on Generalization in Planning.

Student Research Team Leader, Machine Learning and AI   **2020 - 2023**
Spider R&D, NIT Trichy

- Led ML/AI projects at Spider R&D, NIT Trichy; developed *SIHeDA-NET* (Paper) and *GISiL* (Demo), conducted workshops, and represented NIT in national competitions.

Coordinator, Workshops and Publicity   **2020 - 2021**
Currents Symposium, NIT Trichy

- Coordinated workshops, publicity, and hospitality for Currents, EEE Dept. symposium; organized a web development workshop with 600+ participants and promoted events nationwide.