





# VIGNESH SUBRAMANIAN

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## EDUCATION

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### Georgia Institute of Technology

Ph.D. - Computer Science | 2nd Year

Advisor - Prof. Suguman Bansal

Aug 2023 - Ongoing

Atlanta, Georgia

### National Institute of Technology, Tiruchirappalli

B.Tech. - Electrical and Electronics Engineering

Minor - Computer Science Engineering

Aug 2019 - April 2023

Tiruchirappalli, Tamil Nadu

**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

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### • CONFERENCES

#### Inductive Generalization in Reinforcement Learning from Specifications

*Automated Technology for Verification and Analysis, 2025 [to appear]*

Vignesh Subramanian, Rohit Kushwah, Subhajit Roy, Suguman Bansal

[\[Link\]](#)

#### Certification-Guided Evaluation of Reinforcement Learning Generalization (Presentation Only)

*Symposium on AI Verification, 2025 [to appear]*

Vignesh Subramanian, Djordje Zikelic, 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

[\[Link\]](#)

### • WORKSHOPS

#### Certification-Guided Evaluation of Reinforcement Learning Generalization (Short Paper)

*AAAI - Workshop on Generalization in Planning, 2025*

Vignesh Subramanian, Djordje Zikelic, 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

[\[Link\]](#)

## TEACHING EXPERIENCE

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### Graduate Teaching Assistant - SAT/SMT Solvers

Georgia Institute of Technology

Fall 2024

Atlanta, Georgia

- Guiding students on advanced topics in SAT and SMT solvers, including model checking, symbolic execution, neural network verification, and formal verification techniques.

- Supporting assignments and projects that integrate LLM-based reinforcement learning, LLM inference, and proof synthesis for solving complex problems in 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:** Model Checking, Formal Methods for Safety Verification
- **LLM:** Pre-training and fine-tuning large-scale transformer models, LLM-based inference for complex logical queries, reinforcement learning from human feedback (RLHF), and automated proof generation.

## POSITIONS OF RESPONSIBILITY

### Reviewer

2025

AAAI

- Served as a reviewer for the AAAI - Workshop on Generalization in Planning.

### Student Research Mentor, 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.