Srikar Babu Gadipudi

INDIAN INSTITUTE OF TECHNOLOGY MADRAS
srikarbabug.github.io | ee21b138@smail.iitm.ac.in |

Education

- **Indian Institute of Technology Madras** *Jul* 2021 - *May* 2025

  Bachelor of Technology in Electrical Engineering; Minor in Artificial Intelligence and Machine Learning

  ◦ CGPA: **9.59/10.00** | Department Rank: **3 out of 154** students

Publications

[1] **Srikar Babu Gadipudi**, Rachel Kalpana Kalaimani. "Reinforcement Learning for Dynamic Pricing under Competition for Perishable Products." In 2024 28*th International Conference on System Theory, Control and Computing (ICSTCC)*. IEEE, 2024. (**Best Student Paper Award**).

[2] **Srikar Babu Gadipudi**, Srujan Deolasee, Siva Kailas, Wenhao Luo, Katia Sycara, Woojun Kim. "OffRIPP: Offline RL-based Informative Path Planning." Submitted to 2025 *IEEE International Conference on Robotics and Automation (ICRA)*. IEEE, 2025.

[3] Richa Verma, **Srikar Babu Gadipudi**, Srinarayana Nagarathinam, Harshad Khadilkar. "ORCHID: Offline RL for Control of HVAC in Buildings using Historical and Low-Fidelity Simulation Data." In 2024 4*th International Conference on AI ML Systems (In press)*.

Research Experience

- **Robotics Institute Summer Scholar Program (RISS)** *Jun* 2024 - *Sep* 2024

  Mentor: Prof. Katia Sycara, AART Lab, Carnegie Mellon University Pittsburgh, USA

  ◦ Developed OffRIPP, an offline RL-based IPP solver, optimizing information gain without environment interactions.

  ◦ Validated in simulations and real-world experiments, demonstrating adaptability and improved decision-making.

  ◦ Submitted work to ICRA 2025 and presented at the RISS 2024 poster presentation - [Paper, Poster, Video].

- **Research Internship at AFAR Laboratory** *Dec* 2023 - *May* 2024

  Mentor: Prof. Hatice Gunes and Dr. Micol Spitale, AFAR Laboratory, University of Cambridge Remote

  ◦ Analyzed causal links between robot actions and human mental well-being using structural equation modeling.

  ◦ Enhanced therapeutic effectiveness by identifying specific pathways of robot actions impacting human emotions.

  ◦ Conducted macro and micro analysis to capture therapy variations across sessions and robot interactions.

- **Optimal Dynamic Pricing using Reinforcement Learning** *Jul* 2023 - *Jun* 2024

  Mentor: Prof. Rachel Kalpana Kalaimani, IIT Madras Chennai, India

  ◦ Developed a dynamic pricing model using RL to optimize revenue in competitive duopoly with perishable products.

  ◦ Outperformed existing approaches by implementing the deep reinforcement learning algorithm, Soft Actor-Critic.

  ◦ Published our findings at the 28*th International Conference on System Theory, Control and Computing* - [Paper].

- **Policy Newton Algorithm for Reinforcement Learning** *Dec* 2024 - *May* 2024

  Mentor: Prof. Prashanth L.A., IIT Madras Chennai, India

  ◦ Integrated Newton steps into policy gradient algorithms to enhance convergence by avoiding saddle points.

  ◦ Leveraged the Hessian of the reward function to establish convergence to second-order stationary points.

  ◦ Achieved superior performance over naive policy gradient algorithms by incorporating Newton techniques - [Report].

- **Summer Internship at Tata Consultancy Services Research** *May* 2023 - *Nov* 2023

  Mentor: Dr. Harshad Khadilkar, TCS Research Chennai, India

  ◦ Designed ORCHID, an offline RL-based control pipeline in HVAC systems for improved energy efficiency.

  ◦ Implemented Implicit Q-learning algorithm, training with low and high-fidelity data, optimizing HVAC control.

  ◦ Conference paper submitted and accepted at the 2024 4*th International Conference on AI-ML Systems*.

- **Chitti: Reinforcement Learning for Virtual Home Tasks** *May* 2022 - *Mar* 2023

  Club: AI Club, Centre for Innovation, IIT Madras Chennai, India

  ◦ Developed RL agent capable of performing household tasks in 3D simulated environment (AI2THOR).

  ◦ Implemented various RL and deep RL algorithms across diverse environments, including OpenAI Gym and MuJoCo.

- **Research on Quantum Computing and Quantum Information** *Oct* 2022 - *Jan* 2023

  Mentor: Prof. Krishna Jagannathan, IIT Madras Chennai, India

  ◦ Gained proficiency in concepts such as qubit, superposition, and entanglement, essential for coding quantum circuits.

  ◦ Explored quantum algorithms, including Deutsch-Josza, Bernstein-Vazirani, Grover's, and Shor's algorithm.

  ◦ Developed 2×2 Sudoku solver and Triangle Finding solver using Grover's algorithm implemented in Qiskit - GitHub.

Technical Projects

- **CS6700: Reinforcement Learning Course Project** *Jan* 2024 - *May* 2024
  Instructor: Prof. Balaraman Ravindran, IIT Madras | GitHub Chennai, India
  ◦ Implemented conventional RL and deep Rl algorithms including SARSA, DQN, DDQN, DDPG, SAC, and PPO.
  ◦ Programmed Hierarchical RL algorithms—SMDP and Intra-option learning; Model-based-RL algorithms—Dyna-Q.
- **CS6910: Fundamentals of Deep Learning Course Project** *Jan* 2024 - *May* 2024
  Instructor: Prof. Chandra Sekhar C, IIT Madras | GitHub Chennai, India
  ◦ Developed and compared optimization techniques for image classification, analyzing convergence and accuracy.
  ◦ Built image captioning pipelines using CNN-based encoders and RNN-based decoders with BLEU score evaluation.
- **CS6046: Multi-armed Bandits Course Project** *Jul* 2024 - *Nov* 2024
  Instructor: Prof. Srinivas Reddy Kota, IIT Madras | GitHub Chennai, India
  ◦ Explored collaborative best-arm identification in multi-agent bandit systems using UCB and FYL policies.
  ◦ Analyzed theoretical bounds and simulations on star and general networks, demonstrating exponential error decay.

Teaching Experience

- **Teaching Assistant for Control Engineering** *Jul* 2024 - *Present*
  Department of Electrical Engineering, IIT Madras
  ◦ Undergraduate course EE3004: Control Engineering; evaluated examination scripts and conducted tutorial sessions.
- **Avanti Mentor** *Apr* 2021 - *Nov* 2022
  Avanti Fellows
  ◦ Provided mentorship and guidance to underprivileged students during their IIT JEE examination preparation.

Leadership and Extracurricular

- **Head of AI Club** *Apr* 2023 - *May* 2024
  AI Club, Centre for Innovation, IIT Madras
  ◦ Led a diverse team of 60 AI enthusiasts and competitors in the development of innovative AI solutions.
  ◦ Organized seminars and workshops with industry experts to educate students about the advancements in AI.
- **Coordinator for the Analytics Club** *May* 2022 - *Mar* 2023
  Analytics Club, Centre for Innovation, IIT Madras
  ◦ Conducted summer school sessions and workshops on AI and Machine Learning for over 800 students nationwide.
  ◦ Hosted inaugural edition of Convolve, an Inter IIT AI/ML Hackathon powered by Cisco, promoting collaboration.
- **Core Member of the EE Research Club** *Jun* 2024 - *Present*
  EE Research Club, IIT Madras
  ◦ Leading 40-member EE Research Club focused on cultivating a research mindset and building a scientific community.
  ◦ Ideated, organized, and hosted events to foster research engagement like socials, professor interviews, tech talks, etc.
- **RoboLaunch: Come Explore Robotics!** *Jun* 2024 - *Aug* 2024
  RoboLaunch, Carnegie Mellon University
  ◦ Managed technical and logistical support for the RoboLaunch 2024 series, ensuring seamless presentations.

Relevant Coursework

- **Artificial Intelligence and Machine Learning**: Reinforcement Learning; Multi-armed Bandits; Pattern Recognition and Machine Learning; Fundamentals of Deep Learning
- **Controls and Robotics**: Linear Dynamical Systems; Control Engineering
- **Mathematics**: Probability, Statistics, and Stochastic Processes; Multivariable Calculus; Series and Matrices

Skills

Programming Languages: Python, C, C++, MATLAB
Frameworks and Tools: PyTorch, Tensorflow, Ray, Git, Wandb, Gymnasium, MuJoCo, IBM SPSS Amos, Qiskit

Achievements

- Received the **Best Student Paper Award** for the paper "Reinforcement Learning for Dynamic Pricing under Competition for Perishable Products" at the ICSTCC 2024 conference, among 120 participants.
- Selected as one of 40 scholars worldwide for the **Robotics Institute Summer Scholars (RISS)** Program at the Robotics Institute, Carnegie Mellon University.
- Ranked **3 out of 154** students in Electrical Engineering, IIT Madras.
- Secured **All India Rank 960** among 200,000 plus candidates in JEE Advanced 2021.
- Secured **All India Rank 1433** among 1,000,000 plus candidates in JEE Main 2021.
- Secured **179th rank** out of 300,000 plus candidates in TS EAMCET 2021.
- Secured **bronze medal** in the Men's Schroeter Basketball Tournament.