SRIKAR BABU GADIPUDI

INDIAN INSTITUTE OF TECHNOLOGY MADRAS

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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 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).
  - Employed CLIP techniques to process and transform user inputs into agent-readable format, enhancing interaction.
  - 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

- **Team Lead 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!** *Jul 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

- **Programming**: Data Structures and Algorithms; Numerical Methods; Applied Programming Lab

Skills

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

Achievements

- Received the **Best 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 **179$^{\text{th}}$ rank** out of 300,000 plus candidates in TS EAMCET 2021.

- Secured **bronze medal** in the Men's Schroeter Basketball Tournament.