Aditya **Soni**

Research Fellow, Microsoft Research

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Education

Jul 2023 | **Birla Institute of Technology and Science, Pilani**
Aug 2019 | *B.E. in Electronics and Instrumentation, CGPA: 8.16*

Research Experience

Jul 2023 – Present | **Microsoft Research** | **Bangalore, India**
Research Fellow | Mentors: Mayukh Das, Ching-An Cheng
-> **Offline RL bandwidth estimator for RTC**: Designed and implemented an algorithm for making offline RL policies robust to non-stationarity. Deploying the model as a bandwidth estimator in RTC applications, such as Microsoft Teams.
-> **Intelligent Overclocking in Datacenters**: Designed policies for overclocking in Microsoft Azure datacenters, a sequential-decision making problem, via offline policy optimization techniques.

Jan 2023 – June 2023 | **Microsoft Research** | **Bangalore, India**
Research Intern | Mentors: Mayukh Das, Alok Gautam Kumbhare, Pulkit Misra
-> **Fine-tuning Server Parameters for Workload Performance and Sustainability.** Tuned server parameters using reinforcement learning to reduce a server's power consumption by 11.3% while maintaining the workload's latency and throughput.

June 2022 – Dec 2022 | **University of California, San Diego** | **San Diego, USA**
Research Intern | Mentor: Dr. Tzyy-Ping Jung
-> **Detecting students' stress from EEG signals via Deep Learning.** Conducted research on how graph-based transfer learning techniques can be used for stress detection from EEG data in brain-computer interface applications.

Publications

[C.1] **Streetwise Agents: Empowering Offline RL Policies to Outsmart Exogenous Stochastic Disturbances in RTC** [🔗]
Aditya Soni, Mayukh Das, Anjaly Parayil, Supriyo Ghosh, Shivam Shandilya, Ching-An Cheng, Vishak Gopal, Sami Khairy, Gabriel Mittag, Yasaman Hosseinkashi, Chetan Bansal.
[**Under Review @ AAMAS'25**]

[W.1] **Intelligent Overclocking for Improved Cloud Efficiency** [🔗]
Aditya Soni, Mayukh Das, Pulkit Misra, Chetan Bansal.
Cloud Intelligence / AIOps @ ASPLOS'24 [**ASPLOS'24**]

Selected Research Projects

Offline RL for Robust Bandwidth Estimation in RTC
Advisors: Mayukh Das, Ching-An Cheng

- **Streetwise Framework:** Proposed an algorithm for post-deployment policy shaping to improve performance in detected OOD regions. [Paper]
- **Performance:** Achieved upto 18% improvement in call video quality score over baseline offline RL policies (IQL).

Intelligent Overclocking in Azure
Advisor: Pulkit Misra, Mayukh Das

- **Overclocking Policies:** Designed overclocking policies to fulfill service overclocking requests while adhering to rack power draw constraints. Optimized for underlying constrained bilevel optimization problem.
- **Comparative Analysis:** Conducted in-depth studies on datacenters with varying power consumption patterns, implementing various overclocking protocols and power forecasting horizons to evaluate overclocking success rate.

Services

- **Avionics and Design Member** at SEDS, the rocketry club at BITS Pilani, Hyderabad 2019 - 2021
- **PyTorch Contributor** for ONNX export functionalities