

ROHIT SONKER

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EDUCATION

Carnegie Mellon University, Pittsburgh, PA, USA

Jan 2024 – May 2027

Ph.D. in Robotics — GPA 4.0/4.0

Indian Institute of Technology (IIT) Kanpur, India

July 2014 – June 2019

- Master of Technology in Mechanical Engineering — GPA 9.3/10
- Bachelor of Technology in Mechanical Engineering — GPA 7.9/10

PROFESSIONAL EXPERIENCE

Ph.D. Researcher

Jan 2024 - Present

Auton Lab, Carnegie Mellon University, Advisor - Prof. Jeff Schneider

Pittsburgh, PA

- Designed LLM-guided Bayesian Optimization framework that uses LLM priors and interactive user feedback for decision making
- Developed and deployed a multi-timescale Bayesian optimization algorithm for plasma confinement at the DIII-D National Fusion Facility, improving instability avoidance by 117%
- Developed adaptive offline RL algorithm from fusion world model, latent context conditioned policies adapt to changes in plasma dynamics. Experimentally validated at the DIII-D Tokamak Fusion Facility.
- Developed a multi-modal language time-series model using Q-former adaptor and LoRA finetuning for time-series reasoning on small domain specific datasets.
- Trained a DDPM based diffusion model for text conditioned image generation, compared transformer and UNET backbones

Tech Lead Manager

Sept 2023 - Jan 2024

CS DISCO : Legal Tech Company

Gurgaon, India

- Headed data science team in India, directly managed 3 members, design LLM based features like conversations, summarization, and document tagging to improve information retrieval from legal data, leading to first paid customers for DISCO AI services
- Enhanced LLM based AI services with features like conversations, summarization, and document tagging to improve information retrieval from case data, securing the first paid customer for AI services
- Improved RAG knowledge retrieval chatbot with conversational memory and pronoun coreference resolution for long context, accurate multi-turn retrieval over legal documents, leading to 18% improvement in accuracy and task completion

Senior Data Scientist

July 2019 – Aug 2023

Pricewaterhouse Coopers (PwC) US Advisory

Mumbai, India

- Led development of Large Language Model (LLM) system to generate regulatory-complaint clinical trial texts from tabular data, compared prompting vs fine tuning strategies, deployed in AWS securing projects worth \$2M+ with multiple clients
- Architected an AWS platform for healthcare team – created serverless ETL pipeline (Spark, S3, RDS), development env (Sagemaker), deployment env (EC2) with third party integrations – unified 10+ projects and data sources, trained over 50+ team members
- Created a clinical trial design system using predictive models, simulations, LLM agents, project used across multiple big pharma clients, yielding \$0.5M+ in total revenue
- Developed ML model monitoring framework in AWS to detect model drift and data distribution drifts
- Developed and deployed an unsupervised entity matching algorithm as an end-to-end AWS pipeline, incorporating CI/CD, Step Functions, Sagemaker jobs, SNS notifications, supporting both scheduled tasks and immediate processing via an API service
- Worked multi-label prediction of medical concepts in radiographic images, transfer learning and K-NN image retrieval - Secured 2nd Position globally at ImageClef2020 Hackathon, presented & published work at CEUR Clef Conference

TECHNICAL SKILLS

Languages: Python, C/C++, MATLAB, R

ML / DL tools : PyTorch, Keras, MLflow, Scikit Learn, Numpy, DVC

Other Softwares: Robot Simulation (ROS, Mujoco, Pybullet) and Design (Solidworks, Inventor)

Deployment Platforms and Tools: Dockers, Kubernetes, AWS, Azure

PUBLICATIONS AND PRESENTATIONS

- [Oral Talk] **R Sonker** et al. “Dynamics Model Bayesian Optimization for Experimental Design in Tokamaks” American Physical Society Division of Plasma Physics (APS-DPP) 2025
- **R Sonker**, HJF Kaga, J Chen, A Rothstein, I Char, R Shousha, E Kolemen, J Schneider, “Offline Reinforcement for Rotation Profile Control in Tokamaks” Learning for Dynamics and Control Conference L4DC 2026 ([Link](#))
- T Gupta, **R Sonker**, EM Karagozlu, A Capone, B Poczos, J Schneider, “Large Language Model-based Bayesian Optimization for Tokamak Stabilization” NeurIPS 2025, Workshop on Machine Learning and the Physical Sciences ([Link](#))
- **R Sonker***, A Capone*, A Rothstein, HJF Kaga, E Kolemen, J Schneider “Multi-Timescale Dynamics Model Bayesian Optimization for Plasma Stabilization in Tokamaks” International Conference on Machine Learning (ICML) 2025 ([Link](#))
- HJF Kaga, A Rothstein, **R Sonker**, SK Kim, R Shousha, M Kim, K Erickson, J Schneider, E Kolemen, “Interpreting AI for Fusion: an application to Plasma Profile Analysis for Tearing Mode Stability” Under Submission - Physics of Plasma 2025
- A Rothstein, HJF Kaga, **R Sonker**, SK Kim, A Jalalvand, J Schneider, and E Kolemen “Preemptive tearing mode suppression using real-time ECH steering machine learning stability predictions on DIII-D” Bulletin of the American Physical Society 2024 ([Link](#))
- V Shaj, D Büchler, **R Sonker**, P Becker, G Neumann “Hidden Parameter Recurrent State Space Models For Changing Dynamics Scenarios” ICLR 2022 ([Link](#))
- **R Sonker** and A Dutta, “Adding Terrain Height to Improve Model Learning for Path Tracking on Uneven Terrain by a Four Wheel Robot,” in IEEE Robotics and Automation Letters 2021 ([Link](#))
- [Oral Talk] **R Sonker**, A Mishra, P Bansal, A Pattnaik “Techniques for Medical Concept Identification from Multi-Modal Images”, in CEUR Workshop Proceedings, Vol-2696, 2020 ([Link](#))

OTHER RESEARCH PROJECTS

Latent Context Dynamics Models and Reinforcement Learning

Jul 2021 - Dec 2021

Researcher, Karlsruhe Institute of Technology, Advisor - Prof. Gerhard Neumann

Remote

- Developed a latent context dynamics models to automatically infer context in changing dynamics scenarios - method showed improvement over meta learning baselines (published at ICLR)
- Tested model for control tasks by training inverse dynamics models for tracking manipulators of Franka Panda Emika robot and a Pneumatic actuated muscle robot

Model based Learning for Path Tracking on Uneven Terrain

July 2018 - June 2019

Master's Thesis, Indian Institute of Technology Kanpur, Advisor - Prof. Ashish Dutta

Kanpur, India

- Used model-learning with model predictive control (MPC) for path tracking by mobile robot
- Introduced terrain height data as context to increase model generalisation to different terrains
- Analysed effect of planning horizon, controller frequency, action sampling with cross entropy method for MPC
- Carried out various ablation studies to validate method advantages, work published in IEEE Robotics and Automation Letters