Satya Prakash Dash

+44 7423727177 | sprakashdash@gmail.com | GitHub | LinkedIn |

Education

The University of Manchester Jan 2023 - July 2026
PhD in Computer Science

Indian Institute Of Technology, Kharagpur 2015 - 2020
B.Sc. & M.Sc. in Physics (Hons) First Class *GPA: 7.61/10*

Central Board of Secondary Education, India 2013 - 2014
Senior Secondary in Computer Science Stream *Percent: 89.6%*

Research Experience

University of Manchester Jan 2023 - Jul 2026
PhD Term

- Supervised by Prof Sami Kaski, Mingfei Sun & Wei Pan and fully funded via **Dean's Doctoral Scholarship**.
- Working towards understanding the second-order optimizer's trajectory using Fisher Information Matrix and devising fast second-order optimizers for training LLMs.
- Recent Paper submitted to AISTATS 2026 on using Gradient regularized Fisher Information for Fast Adaptation of LLM in transfer learning setting.

Work Experience

Visionify.AI Mar 2022 - Sep 2022
Sr. Machine Learning Research Engineer

- Integrated wandb.ai into classification and object detection model training pipeline.
- Built and deployed perspective correction algorithm for real time footage to improve the accuracy of classification model on stock/out-of-stock classification.
- Built blur detection pipeline to remove blur from hazy capture to improve out-of-stock accuracy for retail supermarkets.
- Worked on quality control of deep-image model which captures and selects high quality image to run object detection, segmentation and classification.

Expand-AI Pvt Ltd Feb 2021 - Mar 2022
Machine Learning Research Engineer

- Established pipeline for data annotation using few-shot ML where we could give 70% faster turn-around time than manual annotation in image classification, object detection, instance segmentation, semantic segmentation in CV and text classification, NER for NLP.
- On boarded three clients, Ludimos, Scion and Mingle Sports and completed tasks in instance and semantic segmentation and produced a million annotations.
- Managed and assessed a team of ten data associates during projects.

Internships

Brain-Feed Pvt. Ltd. Jan 2025 - July 2025
LLM for Nutritional Science

- Built Prompt-Tuning and RAG Pipeline for nuritional supplement data for internal research help for clinicians (using AWS BedRock).
- Built pipeline for in-depth meta-data analysis for clinicians.
- Built fine-tuning methods for adapting Claude LLM to core nutritional supplement data.

CYENS, Cyprus April 2022 - Sep 2022
Advanced Quadrupedal Locomotion from Vision through Deep RL

- Worked on IsaacGym simulator for quadruped locomotion of ANYmal and Unitree-A1 robot and added stone and ball collision simulation to the environment.

- Built vision module (CNN + LSTM) which learns height information from the depth image to assist the robot in obstacle avoidance.
- Built new terrains with holes and pillars of random sizes to check the robustness of controller and compared the performance with a blind controller.

IIT Kharagpur June 2018 - July 2019

Spatial Variability of Ammonia & Particulate Matter Hotspots in India

- Collected a decade of data for Ammonia in netCDF4 format of the Polar Orbiting Metop-A satellite and three decades of PM data by National Air Quality Monitoring (NADP).
- Built pipelines for pre-processing and visualize data using Google's Geo-encoding API.

Research Papers

Rank-1 Approximation of Inverse Fisher for Natural Policy Gradients in Deep Reinforcement Learning (Accepted to TMLR 2026 [LINK])
Yingxiao Huo, Satya Prakash Dash, Radu Stoican, Samuel Kaski, Mingfei Sun.

Gradient Regularized Natural Gradient (Submitted to AISTATS 2025)
Satya Prakash Dash, Hossein Abdi, Wei Pan, Samuel Kaski, Mingfei Sun - AISTATS 2026

Guided Riemannian Optimization (GuRO): Bridging Model Predictive Control and Decision Transformers (submitted to ICRA 2025)
Hossei Abdi, Satya Prakash Dash, Wei Pan, Mingfei Sun.

Record-high levels of Atmospheric Ammonia over India: Spatial and Temporal Analysis 2020.
J. Kuttippurath, Ajay Singh, S. P. Dash, N. Mallick, C. Clerbaux, M. Van Damme, L. Clarisse, P-F. Coheur and H. Varikoden - Science of Total Environment, Elsevier.

Conferences & Summer Schools

University of Cambridge Summer School: Selected for Cambridge Ellis Unit Summer School on Probabilistic Machine Learning (July 2023).

NeuroMatch Academy: Selected & Participated at NeuroMatch Academy! Deep Learning Course (August 2021).

RLVS (Virtual School): Attended RLVS (Virtual School) by ANITI Toulouse Institute and DeepMind (Mar 2021 - Apr 2021).

ACCMS-ICMG 2020: Gave a talk on the Advances and the Future of Meta Reinforcement Learning in continuous control tasks and in Material Informatics at (ACCMS-ICMG 2020).

Projects

Fixed-Fisher for Pre-Training LLMs | *July 2025 - Sept 2025*

- This project has been selected for RAEng Research Ready Summer internship by the **Royal Academy of Engineering**.
- Propose the use of scalable Natural Gradient Descent for faster pre-training of LLMs.
- Work was conducted for pre-training of GPT2 an ViT and gives superior performance than AdamW training.

Policy Gradient Algorithms in PyTorch - RL.Fun.Do | *Jan 2019 - July 2020*

- Implemented RL algorithms like DDPG, PPO, TRPO and SAC for OpenAI Gym and also on TORCS.
- Formulated a theoretical framework for RL based on Statistical Physics where, I formulated a state dependent partition function to generate bellman equations and used them to find state value function, Q-value and policy in deterministic as well as stochastic setting.
- Masters' thesis: Continuous Control in Deep Reinforcement Learning and a connection to Statistical Physics.

Computational Neuroscience | *Jan 2018 - Apr 2019*

- Simulated the rate response and tuning curves of Auditory Nerve Fibre through tones and actual speech, using the model provided in the paper: Zilany et al.
- Examined and coded the non-linear dynamical spiking of neurons through Morris-Lecar equations and Hodgkin-Huxley Model by simulating them in Matlab.

Reviewer

ICML 2025: Reviewed papers related to multi-objective optimization for ICML 2025.

Reproducibility Challenge, RC 2020: Reviewer position at Reproducibility Challenge, RC 2020.

Scholarship

Dean's Doctoral Scholarship: (2023) awarded by the University of Manchester for for the full term of PhD.

Inspire Scholarship: (2015-2020) by DST, Government of India through JEE Advanced 2015.

Certifications & Achievements

CUDA Certification: Completed NVIDIA certification on CUDA C++ Applications with multi-GPUs.

Social & Cultural Secretary: of Azad Hall of Residence, IIT Kharagpur (2016-2017)

INMO: Selected for INMO and INMO Camp and cleared Regional Mathematical Olympiad 2014.

Relevant Skills

Programming Languages: Python (PyTorch, Keras, Tensorflow2, OpenCV, Numpy, Scikit-Learn, Flask), C++ (STL, CUDA, OpenMP)

Tools: ROS, MuJoCo, PyBullet, VS Code, JupyterLab, GCP, AWS-Bedrock, Docker, Git, Matlab, LATEX

Relevant Courses

Major coursework: Programming & Data Structure & Lab, Design and Analysis of Algorithms & Lab, Probability and Statistics, Stochastic Processes, Statistical Physics, Deep Learning Foundation and Application, Artificial Intelligence, Computational Physics & Lab, Neuronal Coding of Sensory Information, Computational Neuroscience, Optimal Control, Order and Chaos (Non-Linear Dynamics)