Rudrrayan Manna

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Education

University of Southampton — Southampton, United Kingdom
BSc Hons. Computer Science, 1st class — *Sep. 2024 – Jun. 2027*

Experience

Groq Distributed systems + Inference engineer — Jan 2026 – May 2026
Groq — *London, United Kingdom*
- Part of the Distributed systems and Inference team, working primarily in C++ and Python.
- Exact project details TBD.

Jülich Supercomputing Centre Research Internship — Aug 2025 – Oct 2025
Forschungszentrum Jülich — *Jülich, Germany*
- Researching algorithms for parallelising the Fast Multipole Method of N-body simulation.
- Writing **multi-node multi-gpu** software in modern C++ using **CUDA/NVSHMEM**
- Reduced host data transfer time by **85%** and reduced latency by **40%**

Founders Inc. Offseason programme — Jun 2025 – Aug 2025
Founders Inc. — *San Fransisco, USA*
- Among **50 selected** to work on my startup, Topaz, mentored by $100m+ founders.

BriCS Team Member — Feb 2025 – Jun 2025
Bristol Centre for Supercomputing — *Bristol, United Kingdom*
- Fine-tuning scientific software on **$400k of compute** for the **ISC Student Cluster Competition**.
- Linux sysadmin, using **Ansible** for provisioning, with heavy use of Spack, MPI, and SLURM workloads.
- Fine tuned configurations for HPL, HPCG and SeisSol scientific software.

XPRIZE team developer — Jan 2025 – Apr 2025
Soorati Lab, Swarm Robotics Research Group — *Southampton, United Kingdom*
- Developing HARIS, a human-swarm interaction platform for the XPRIZE initiative.
- Able to **autonomously** position and allocate **over 100** swarm drones to suppress wildfires.

Projects

FMMTree | *C++, NVSHMEM, CUDA, CMake* — Aug 2025 – Present
- Developed an **Octree engine** for scientific High Performance Computing scenarios.
- Capable of distributing across dozens of nodes and tested up to **32 A100 GPUs** using NVSHMEM.
- All implemented kernels maintaining atleast **90%** resource utilisation.

Tensorgrad | *C, OpenMP, Python* — Jun 2024 – Oct 2024
- Built an AutoGrad (Auto Differentiation) engine in pure Python, using C/CUDA extensions.

OrbitSim | *C++, OpenGL, CUDA, ImGUI, GLSL, CMake* — Jul 2023 – Jan 2024
- Developed a highly efficient, safely multi-threaded, orbital simulator in C++ using SFML rendering.
- Implementation of the **Barnes-Hut** recursive treecode algorithm to optimise multi-body simulations.
- Smoothly simulating up to **100k bodies without a GPU**. A separate CUDA branch is included.

Achievements

LauzHack 2025 Overall winner — Nov 2025
- Won the overall prize among 400 participants. Also won prizes for Logitech and Jetbrains.
- Built Logilinux - a from-scratch linux **C++ device driver** and programmable SDK for Logitech devices.

Junction 2025 Overall winner | *C++, OpenGL, ImGUI* — Nov 2025
- Won the overall prize of **€10,000 (1500 participants)** and the Sensofusion **title track prize** (DJI drone kit)
- Developed a EM/Radio wave simulator for dense metro areas. Pure C++/OpenGL.

UK & Ireland Programming Contest (UKIEPC) — Oct 2025
- **Ranked 1st** out of all Southampton teams in solving challenging programming puzzles.
- Achieved an invitational expenses-paid trip to Germany to compete in the NWERC finals.

HackUPC 2025 Revolut track prize | *Python, Pytorch, Langchain, ReactJS, Supabase* — Apr 2025
- Achieved **1st place** at one of the largest hackathons in Europe, winning a **$1000 DJI Drone kit**
- Developed an LLM recommender and web scraping tool to find student discounts and refer-a-friend programs.

National Cipher Challenge | *Python* — Dec 2022, Dec 2023
- Won the **gold medal £1000 IBM Prize** in 2023 and a **Silver medal** in 2024 among **7000 teams.**
- Used genetic algorithms and text statistics to break encrypted text in **Python**.

British Informatics Olympiad | *Python, C++* — Jan 2023
- Scored **80** in the 2023 British Informatics Olympiad, within the **top 5% (∼50)**.
- Solved and contributed to editorials of **over 15 historic contests** as part of AlgoSpace.

Technical Skills

- **Languages**: C/C++, Python, JavaScript **Frameworks**: OpenMP, MPI, CUDA, Sveltekit, Godot Engine, SFML, Pytorch, OpenGL