

Bence Hervay

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Education

Computer Science BA — University of Cambridge (Trinity College)

Oct 2021 – Jun 2024

Second Best Computer Science Dissertation (92.5%) in a cohort of 120 students

Full Academic Merit Scholarship awarded to only 5 students (£60k p.a.)

Strong 2:1 overall (75% average across modules)

Advanced Mathematics Class — Fazekas Mihály Grammar School

Sep 2015 – Jul 2021

National Olympiads — 1st in Mathematics (2018); 1st in Physics (2020); consistently top 10 throughout high school

FGC Robotics World Champions (2017); invited to the White House in celebration of our victory ahead of 150+ countries

Diverse results across STEM (25+ national top 3 placements in Mathematics, Computer Science, Physics, and Robotics)

A*A*A* equivalent final grades; Fazekas Medallion of Excellence for outstanding performance

Artificial Intelligence Technology Training — KÜRT Academy

Jan 2019 – Jun 2019

Project-based in-depth ML course; completed as the youngest participant ever (at the age of 16)

Work Experience

Quantitative Research Engineer — AGITProp

Sep 2024 – Present

Automatic detection and statistical refinement of financially interpretable factors for predicting covariance matrices

Primary ownership of numerous key modules in the pipeline (mainly mathematical components)

Key role in project planning and coordination, contributing to firm-level prioritisation decisions

Constant expansion and maintenance of the infrastructure (e.g. quantitative modules, data pipeline, testing)

Software Developer Intern — DRW

Jun 2023 – Sep 2023

Created a fully automated monitoring and resource allocation tool used by 200+ employees daily

Utilised NLP techniques to filter, classify, and distribute bug reports to maximise efficiency

Quantitative Research Intern — WorldQuant

Jun 2022 – Aug 2022

Generalised index rebalance alphas by automatic inference of rebalance schedules and methodologies

Developed a framework to mass-produce low-correlation alphas using random decision forests

Senior Group Leader — Alphacademy

Aug 2021 – Jun 2023

Taught programming to 100+ students from beginner to Olympiad level on a weekly basis

Member of the founding team; onboarded and managed the work of 20+ teachers

Projects & Research

Rupert's Problem — C++ & TypeScript

Jun 2024 – Present

Independently settled a 350-year-old open mathematical conjecture: whether every convex polyhedron fits through itself

Heavily computer-assisted proof involving 10,000+ lines of C++ utilising interval arithmetic to bound floating-point inaccuracy

Novel solutions to numerous complex sub-problems; 1,000+ hours of independent research; preprint in progress

Reinforcement Learning for 2048 — C++ (Cambridge Dissertation)

Sep 2023 – May 2024

Developed the world's highest-scoring algorithm and the fastest simulation engine for the 2048 Puzzle Game

The agent constructs a 2048-tile within 1.2 milliseconds in 99.98% of games and even the 32768-tile in 75% of games

Trained a custom 200M-parameter RAMnet via self-play reinforcement learning on 150M games

Combined expectimax search with locally brute-forced critical phases to maximise the probability of survival

Selected Additional Projects — Python & Java & C++

Each built without relying on high-level libraries to ensure deep understanding of the fundamentals

GM-level chess engine — Awarded a research scholarship by the Hungarian National Research Excellence Program

3D path tracer — Won the Cambridge rendering competition organised across the full cohort of 120 students

Project Euler — Top 0.04% of all users, solved ~250 problems in total (including all of the first 222)

C++ automatic differentiation framework — Used for ball tracking in a video-assistant-referee system

Stacked MWPC for atmospheric muon tomography — Invited to the Large Hadron Collider (CMS detector)

Handwritten digit classifier DNN with a GUI; Rubik's cube solver robot; Time-travel-based platformer game;

Advanced algorithms for Multiplayer Pac-Man, Sudoku, Nonogram, and numerous other strategic games

Skills

Python & C++ with 250,000+ LOC experience, quantitative and statistical methods, ML, advanced DSA, low-level optimisation

Cross-disciplinary STEM expertise; data-driven solutions to theoretical and practical problems from first principles

Extracurricular

Rubik's Cube speedsolving — 14-second average; 20x national top 20

Ultimate Frisbee — UK National Championship 6th (2023)

Great Court Run — 3rd (2021); 2nd (2022); 1st & Beat the Clock (2023)

Face Team Acrobatic Basketball — World Cup 4th (2018)

Activities

Always happy to discuss interesting puzzles and brain teasers

Regular Instructor — European Summer Program on Rationality

Events Officer — Cambridge University Hungarian Society

Captain and coach — Trinity College Ultimate Frisbee Society