

# Euan Ong

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*move slow and fix things*

## Education

### University of Cambridge (Computer Science Tripos)

Cambridge, UK

TRINITY COLLEGE

2020 - 2023

- In both Year 1 & Year 2: Ranked 1<sup>st</sup> out of 115 students; elected to a **Senior Scholarship**; awarded the **CST Department Prize for Best Student**, **Trinity Examination Prize**, **Top of Tripos Prize**, **Percy and Jeremy Pemberton Prizes** (for the two Trinity College undergraduates in Year 1 and Year 2 “who have most distinguished themselves in their studies”)

### Magdalen College School

Oxford, UK

A LEVELS: 4 A\* (FURTHER MATHS / PHYSICS / CHEMISTRY / MATHS), GCSEs: 12 A\*

2010 - 2020

## Skills

- Programming** Python (numpy, pandas, TensorFlow / PyTorch / JAX), OCaml, Java, C++, MATLAB // Learning Haskell
- General** Mathematics, algorithms and data structures, Linux/Unix server management, Docker, LaTeX, cybersecurity, Git
- Languages** English, French, Spanish

## Employment History

### Jane Street Capital (Software Engineering Intern)

Jul - Sept 2022

- Developed in-house systems in OCaml, gaining an appreciation for the use of functional paradigms such as **monads**, **GADTs**, **existential types** and **type witnesses** in large-scale software engineering. **Received an offer to join as a full-time software engineer.**
- **Prototyped an email processing pipeline** with a rich filtering DSL, and a **system for autogenerating first-class field accessors** for a complex message datatype.

### Focal Point Positioning (Research & Development Intern)

Jul - Aug 2021

- Analysed and evaluated the performance of machine learning models in Python when used in a pipeline for pedestrian dead reckoning.

### Cisco Ensoft (Software Development Micro-Intern)

Jul 2021

- Implemented features and visualisations in Python for an internal Cisco dashboard.

## Research History

### Learnable Commutative Monoids for Graph Neural Networks

LEARNING ON GRAPHS 2022 (PROCEEDINGS TRACK)

2021 - 2022

- Conducted independent research into the **expressivity bottlenecks of graph neural network (GNN) aggregators** through the lens of commutative monoid homomorphisms, under the supervision of [Dr Petar Veličković](#).
- Proposed **novel GNN aggregators** inspired by concepts in **abstract algebra and functional programming**, that **beat the state of the art** on complex aggregation problems while remaining **efficient and parallelisable** on large graphs.

### Dissecting Transformers for Systematic Generalisation

HACKBRIDGE RESEARCH PROJECT

2020 - 2021

- Collaborated on a research project to **investigate the capabilities of transformers to systematically generalise on learning to recognise formal languages**, in conjunction with Hackbridge, the University of Cambridge's research and entrepreneurship society.
- Studied representative languages such as PARITY and 2-DYCK, **identifying parallel aggregation-based algorithms** that we hypothesise transformers use to recognise these languages, and **empirically corroborating various theoretical claims** about transformer generalisation.

### Object Detection in Thermal Imagery via Convolutional Neural Networks

WINNER (DATA SCIENCE), TEENTECH AWARDS

2018 - 2020

- Conducted a **machine learning research project** under the supervision of [Professor Niki Trigoni](#) and [Dr Pedro Porto Buarque de Gusmão](#).
- The project was submitted to the TeenTech Awards 2020, where it **won the Data Science project award in the senior category (age 17-19)**.

## Computing

### International Olympiad in Informatics (IOI)

Singapore / Azerbaijan

BRONZE MEDALLIST, TEAM UK

Sept 2020 / Aug 2019

- Selected as one of the **top 4 computer scientists in the UK** to compete in the 32nd International Olympiad in Informatics, held online due to COVID-19. **Won a bronze medal**, placing 91st out of 343 contestants.
- Also represented the UK as part of a team of 4 in the 31st International Olympiad in Informatics, held in Baku, Azerbaijan in June 2019.
- Deployed an **online judge and training portal** for finalists to train on British Informatics Olympiad problems.

## Cybersecurity Contests

### VARIOUS AWARDS

2017 - ongoing

- In 2023, **won first place as part of team cheriPI in the finals of pwnEd**, hosted by the University of Edinburgh.
- In 2022, **won first place as part of team cheriPI in the finals of LakeCTF**, hosted by EPFL.
- In 2022, **won first place** as a team in the **international Country-to-Country CTF competition**.
- In 2022, **invited to Meta's BountyCon EDU conference** for university students skilled in application security engineering
- In 2021, **placed in the top 15 teams in NYU's CSAW CTF**, qualifying for the finals.
- In 2021, **won the Global CyberPeace Challenge CTF IT track**, and placed fourth in the OT track (a **SANS Grid NetWars** tournament)
- In 2020, took the SANS **SEC504: Hacker Tools, Techniques, Exploits, and Incident Handling** course, **placing second on the course CTF**.
- In 2018, participated in HM Government's **Cyber Discovery** programme. **Won first place** in a real-world Internet of Things penetration testing scenario and earned the **highest individual score** in the CTF. **Won the Best Individual Performer award at CyberStart Elite**, qualifying for the **Cyber Security Challenge Masterclass (National Finals)** – at this event, won a ticket to the Black Hat conference.

### Hack Cambridge Atlas

#### OVERALL WINNER (HEARSIGHT)

Jan 2022

- Competed in a team of 4 at the University of Cambridge's **annual hackathon** to develop **HearSight**, a wearable headset for the visually impaired rendering a 3D binaural 'sound map' of the world around them. The project **won the Main Challenge of the hackathon**.

### Google Code-In

#### GRAND PRIZE WINNER

Dec 2017

- **Contributed to open-source organisation Sugar Labs** for a month, fixing bugs and coding applications.
- **Ported programs** from a desktop client to a mobile/web-based client, and **constructed a PHP/MySQL server backend, moderation portal and project sharing site** for an online block-based programming language (**Music Blocks**).
- Acted as a mentor for Google Code In 2018 and 2019, helping students new to open source development learn how to contribute and get to grips with the frameworks used by Sugar Labs. Assessed student work and created tasks for students to complete.

## Other Awards & Achievements

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### UKMT IMO Winter School

Hungary

#### INVITED STUDENT

Dec 2018

- Selected as one of the **top 20 UK mathematicians** based on BMO1 performance for an intensive, 8 day long olympiad training camp.

### UKMT Initial Olympiad Training Camp

Oxford

#### INVITED STUDENT

Aug 2018

- Selected as one of the **top 24 UK mathematicians** in or under year 11 based on BMO/IMOK performance for an intensive, week-long olympiad training camp. Ranked in the top third (**top 8**) in the Oxford Olympiad. Selected for the Advanced Mentoring Scheme, "for those students working closest to IMO level".

2020 **Team UK**, International Olympiad on Astronomy and Astrophysics (IOAA)

2020 **Winner**, Magdalen College School Coronation Cup ("most outstanding achievement ... during the year")

2020 **Distinction**, UKMT British Mathematical Olympiad Round 2

2019 **Finalist (top 17)**, UK Linguistics Olympiad

2019 **Roentgenium Award (top 56)**, Cambridge Chemistry Challenge (C3L6)

2019 **Winner (GCSE category)**, British Education Awards

2019 **Distinction**, ABRSM Grade 8 Piano

## Community

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### Cambridge University Cyber Security Society (CyberSoc)

#### PRESIDENT

2021 - ongoing

- Spearheaded the revival of **CyberSoc**, Cambridge's cybersecurity society, after a 2 year hiatus, organising frequent events and workshops.
- Revived and grew **cheriPI**, Cambridge's CTF team, which now regularly qualifies for final rounds of national and international CTFs.

### Cambridge University Computing and Technology Society (CUCaTS)

#### PRESIDENT

2020 - ongoing

- Working to restart **CUCaTS**, Cambridge's computer science and technology society, after a hiatus in 2019-20.
- Ran events for Cambridge computer scientists and the wider STEM community, organised a **puzzlehunt** and **used a CP-SAT solver to assign students to study groups**, taking into account factors such as availability, college and study preferences.
- Planned and executed **Cambridge's first machine learning conference for undergraduates**, with Cambridge University AI Society.
- Organised an informal **machine learning collective and reading group** to grow the undergraduate ML researcher community at Cambridge.
- Co-organised a **Cambridge hub for the Learning on Graphs conference 2022**.

### University of Cambridge Competitive Programming Society (UCCPS)

#### JUNIOR TREASURER, CO-FOUNDER

2020 - 2021

- Managed society finances and administrative tools, and **helped to develop the society website**.
- Helped to organise a **virtual introduction to competitive programming workshop and contest series** with **over 100 participants**, and a **lecture series** with well-known speakers from competitive programming.