

David Davies

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RESEARCH INTERESTS

- λ -Calculus (and variants)
- Type Theory
- Curry-Howard Correspondence
- Functional Programming Languages
- Theorem Provers
- Classical Logic

EDUCATION

MEng (1st Class) Joint Mathematics and Computer Science , Imperial College London	2017 — 2021
Secondary School West Buckland School, North Devon	2011 — 2017
<ul style="list-style-type: none">• A Level: A*A*A* in Maths, Further Maths, Chemistry• Academic & Music Scholarship• Grades 1,2 in STEP I, II (resp.), 67 in MAT• UKMT: Senior Gold x2, Intermediate Gold x2, Kangaroo• Maths & Chemistry prizes for best in Upper Sixth Form• GCSE: 8A*2A (incl. English & Maths), FSMQ: A	

ACADEMIC PROJECTS

Theorem Proving in Classical Logic Master's Individual Project	2021
<ul style="list-style-type: none">• Extended current research into λ-calculi with control operators; both simply and dependently typed, by adding dependent disjunction elimination, inductive data and co-data to current classical calculi.• Designed and implemented a proof assistant (programming language), with dependent types and control operators, able to prove statements that are not provable (but classically true) in previous theorem provers.	
XCLAIM 3 rd Year Group Project	2020
<ul style="list-style-type: none">• Team of 6; project to create a decentralised system for exchanging between specific cryptocurrencies.• Created webapp for users, smart contract to handle Ethereum exchanges and Python CLI for currency backing.• Involved implementing an abstract design laid out by a research paper.	

WORK EXPERIENCE

Imperial College London Undergraduate Teaching Assistant	Jan — Apr 2020
<ul style="list-style-type: none">• Lead weekly tutorials for 8 first year students; covering Graph Theory, Algorithms, Logic• Mark and provide feedback for weekly submissions from the tutees.	
NHS Digital Data Trainee	Jun — Sept 2020
<ul style="list-style-type: none">• Realistic Data Synthesis with ML, to speed up access to realistic data for researchers• Reviewed current literature in data synthesis, implemented this into a data generator to mimic arbitrary datasets	

PUBLICATIONS

David Davies, Steffen van Bakel, Nicolas Wu. *Candid: A Dependently Typed Programming Language with Control Operators for Classical Logic*. Submitted to Proceedings of the ACM on Programming Languages (2022).

AWARDS

2021	Donald Davies Prize: Best final year undergraduate computing project in Joint Maths and Computer Science, Imperial College London
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CONFERENCES & EVENTS

Apr 2021 Midlands Graduate School in the Foundations of Computing, Attendee, Virtual

TECHNICAL SKILLS

Proficient:	Haskell, Java, Python, ML (Tensorflow)
Other Skills:	Lean, Agda, Webdev (Javascript), CI/CD, Version Control, Prolog, SQL

INTERESTS

- Lead guitar and sang in a 3-piece band (2015-18). 100+ gigs, some to over 1000 people. From this I gained strong presentation skills; I am comfortable, and can happily communicate, with audiences of any size.
- Grade 8 Violin, which I have played for 16 years.
- 1 of 6 students selected for South West Music School's composition class (2014-16); I learned how to structure and complete multiple long-term creative projects. Workshops at the end of each term involved writing a piece for ensemble within 3 days, giving me experience in working to a tight deadline.
- IC Hockey Men's 4s; Imperial Live Music Society.