

# David Davies

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## RESEARCH INTERESTS

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

## EDUCATION

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

## ACADEMIC PROJECTS

<b>Theorem Proving in Classical Logic  </b> Master's Individual Project	2021
<ul style="list-style-type: none"><li>• Extended current research into <math>\lambda</math>-calculi with control operators; both simply and dependently typed, by adding dependent disjunction elimination, inductive data and co-data to current classical calculi.</li><li>• 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.</li></ul>	
<b>XCLAIM  </b> 3 <sup>rd</sup> Year Group Project	2020
<ul style="list-style-type: none"><li>• Team of 6; project to create a decentralised system for exchanging between specific cryptocurrencies.</li><li>• Created webapp for users, smart contract to handle Ethereum exchanges and Python CLI for currency backing.</li><li>• Involved implementing an abstract design laid out by a research paper.</li></ul>	

## WORK EXPERIENCE

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

## 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

<b>2021</b>	<b>Donald Davies Prize:</b> 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

<b>Proficient:</b>	Haskell, Java, Python, ML (Tensorflow)
<b>Other Skills:</b>	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.