Derek Sorensen

Curriculum Vitae

Education

- 2019–2023 PhD in Computer Science, University of Cambridge.
- 2016–2017 **MSc in Mathematics and Foundations of Computer Science**, *University of Oxford*.
- 2013–2016 BSc in Mathematics, Brigham Young University, Provo, UT, USA.

Interests

I am interested—mathematically, philosophically, scientifically—in the notions of *proposition* and *proof* in computer science. My doctoral research, in formal methods, asked how we can reason about the correctness of smart contract *specifications*, promoting correct and resilient design. It touched on the nature of mathematical and computer-scientific abstraction, the meaning of proofs, and the degree to which mathematics can, or should, be used in the specification process itself. Moving forward, I am interested in formal verification of economic properties of smart contracts, as well as the ongoing work in the formalization of mathematics.

Publications

- 2023 Sorensen, D. Tokenized Carbon Credits. Ledger, 2023.
- 2023 Sorensen, D. Structured Pools for Tokenized Carbon Credits. ICBC CryptoEx 2023.
- 2019 Butt, K., Sorensen, D. *Streamlining Classical Consensus*. International Journal of Blockchains and Cryptocurrencies. Vol. 1, No. 4.
- 2019 Sorensen, D. Establishing Standards for Consensus on Blockchains. ICBC 2019.
- 2017 A. Francis, D. Smith, D. Sorensen and B. Webb, *Extensions and applications of equitable decompositions for graphs with symmetries.* Linear Algebra and its Applications **532** (2017), 432-462.

Experience

- Oct 2022 Software Engineer, Protocol Labs, Remote.
- Mar 2023 Contributor to Lurk, a Turing complete dialect of LISP for zero-knowledge proofs.
 Contributed to specification of meta-Lurk, which allows for recursive reference to and computation over zero-knowledge proofs
- May 2021 Business Development: Sustainability, TriliTech, London, UK.
 - Aug 2022 Advised sustainability-oriented businesses building on Tezos, including in tokenized carbon offsets, regenerative finance (ReFi), and sustainability-oriented art marketplaces

- Member of the Technical Advisory Committee, the funding body for the Tezos Foundation

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- March 2021 Consultant: Decentralised Finance, Gro, London, United Kingdom.
 - May 2021 Advised on decentralised deposit insurance on the Ethereum Blockchain - Built optimisation model for the system we built to optimise parameters for consumers
 - Jan 2021 Consultant: Intellectual Property on Blockchains, Cambridge, United Kingdom.
 - March 2021 Identified industries most likely to tokenise intellectual property rights - Delivered specific, technical details to tokenise intellectual property rights and how it might integrate with existing business models and regulation
 - Oct 2019 Formal Verification Engineer, Clearmatics, London, United Kingdom.
 - Nov 2020 Designed, formally specified, and formally verified enterprise blockchains - Advised the software development life cycle to formally verify Ethereum smart contracts
 - Lectured to the engineering team on formal methods
 - Jul 2019 Consultant: Cryptocurrency Design, Digital Asset, New York, NY.
 - Sep 2019 Designed and built a functional cryptocurrency that supports legal compliance and business-friendly privacy features
 - Specified privacy model, fee structure, minting structure, and incentive systems
- March 2018 **Consultant: Blockchain Language Verification**, *RChain Coop*, Seattle, WA. Oct 2018 Developed the formal semantics of the language Rholang in the K Framework
 - Mar 2018 Research Mathematician, Pyrofex Corporation, Provo, UT.
 - Jun 2019 Research in the fundamental algorithms supporting cryptocurrencies.
 - Developed cryptocurrency that can process transactions at the rate of Visa.
 - Built the formal semantics for Rholang in K-Framework for the RChain Coop.
 - 2017-2019 Adjunct Faculty (Mathematics), Utah Valley University, Orem, UT.
 - Wrote lecture notes, homework, quizzes, exams.
 - Marked and give feedback to all written work.

Scholarships and Awards

- 2016 Robert K Thomas Honors Scholarship
- 2015 AMS Math in Moscow Travel Grant
- 2015 Marc Burton Scholarship
- 2015 Best of session at the 2015 BYU Spring Research Conference
- 2014 & 2015 Award for Excellence in Undergraduate Research
- 2014 & 2015 Award for Academic Excellence in Mathematics

Teaching

- Mich. 2020 Economics, Law, and Ethics (University of Cambridge)
- Mich. 2020 Analysis & Topology (University of Cambridge)
- Summer 2020 Artificial Intelligence in Blockchain Security (Immerse Education)
- Summer 2020 Relating the Price of Bitcoin and its Related Cryptocurrencies to Their Respective Trading Volumes (Horizon Inspires)
- Summer 2020 Predicting NBA Playoff Results With Machine Learning (Horizon Inspires)
 - Lent 2020 Groups, Rings, and Modules (University of Cambridge)
 - Spring 2019 Stat 1040 Introduction to Statistics (Utah Valley University)

Flat 31, Auckland Ct, Auckland Rd – Cambridge, UK CB5 8DS ⊠ derekhsorensen@gmail.com • 1 derekhsorensen.com Spring 2018 Stat 1040 - Introduction to Statistics (Utah Valley University)

Spring 2018 Stat 2040 - Introduction to Statistics (Utah Valley University)

Spring 2018 Math 1050 - College Algebra (Utah Valley University)

Presentations

- 2023 Tokenized Carbon Credits, IEE ICBC CryptoEx, Dubai, UAE
- 2022 Applications of Blockchains to Decentralised Finance, Markets, Art, and Beyond, **University of Cambridge**, *Cambridge*, *England*
- 2021 Blockchain & DeFi: The Technology and its Applications, Judge Business School, University of Cambridge, Cambridge, England
- 2018 Rholang Semantics and the K-Framework, RCon3, Berlin, Germany
- 2018 Formal Verification Panel, RCon3, Berlin, Germany
- 2015 Presentation at the 2015 BYU Spring Research Conference \circ Voted best of session
- 2014 Presentation at the 2014 BYU Spring Research Conference

Summer Schools

- 2021 Oxford Fintech Programme
- 2019 Interenational Conference and Summer School of Homotopy Type Theory
- 2017 CMI-LMS Research School Algebraic Topology of Manifolds

Computer skills

Coq, CameLIGO, DAML, K Framework

Spoken Languages

Native English Fluent Spanish Intermediate Russian Basic French