

## Education

### University of Massachusetts, Amherst

B.S. in Computer Science and Math  
(Cryptocurrency focus)

September 2017 - Present

Amherst, MA

#### Courses:

Cryptography (**Graduate**)  
Operating Systems  
Algorithms  
Functional Programming  
Software Engineering  
Abstract Algebra  
Data Structures

## Awards

- Binance DEXathon Winner (\$50,000)
- MIT Bitcoin Hackathon: City of Zion Prize (\$5,000)
- HackUMass V: Grand Prize
- YHack: JP Morgan Finance of the Future Prize

## Leadership

### HackUMass | Logistics Director

- Orchestrate all logistics for HackUMass, UMass's annual hackathon with an attendance of over one thousand people.
- Manage team members and volunteers for event logistics.

### UMass ACM | Chapter President

- Oversee all major functions of the UMass ACM Student Chapter.
- Managing leadership of interest groups.

## Skills

• Go • Rust • C++ • TypeScript • Elixir  
• OCaml • Solidity • Scala •  $\text{\LaTeX}$  • C  
• Lisp • Perl • Haskell • Python • Git  
• C# • Linux • .NET

## Experience

### MIT Digital Currency Initiative | Undergraduate Researcher Cambridge, MA

January 2019 - September 2019 (Present)

- **Working on an academic paper** on using distributed systems and cryptographic protocols to decrease trust needed in cryptocurrency and securities exchanges.
- Working on layer 2 technologies such as the Bitcoin Lightning Network and hash time lock contracts (HTLCs) to implement decentralized exchange technology
- Designing algorithms to mitigate the front-running problem in cryptocurrency and securities exchanges.
- Implemented research while building OpenCX, an open source cryptocurrency exchange framework.

### Charles River Analytics | Software Engineer Intern Cambridge, MA

June 2018 - August 2018

- Created framework to score causal analysis algorithms for time series analysis in Python.
- Implemented various statistical analysis methods to detect causality in time series data with Granger, Pearson, and Convergent Cross Mapping tests.
- Demonstrated an increase in precision and recall for detecting causal effects in sets of arbitrary time series data.

## Projects

### OpenCX | Open-source project - Author

- Author of OpenCX, the first open-source toolkit for building asset exchanges.
- Implemented a distributed batching system for revealing and decrypting exchange orders that are locked in cryptographic puzzles for a certain amount of time.
- Developed state of the art features for non-custodial trading, privacy-preserving proofs of solvency, verifiable delay functions, and public verifiability of exchange behavior.
- Designed and implemented a novel front-running resistant and non-custodial exchange protocol using tools from OpenCX.

### Lit | Open-source project - Contributor

- Contributor to lit, a Lightning Network node implementation compatible with the Bitcoin, Vertcoin, and Litecoin cryptocurrencies.
- The Lightning Network provides cryptocurrency users with higher transaction throughput and decreased fees by using off-blockchain payment channels.
- Implemented event bus system and other improvements to the software in an effort to increase software interoperability.

### Binance DEX | Open-source project - Co-author

- Modified the Bitcoin codebase to implement asset creation, limit GTC order creation, and delegate voting on the blockchain.
- Designed and implemented the **first ever Delegated Proof of Stake consensus algorithm** that works with the UTXO Model.
- Won **\$50,000** for DEX implementation. Technical report and design rationale can be read at dancline.net/binance.