

Education

- **University of Illinois at Urbana-Champaign** Urbana, IL
Advisor: Andrew Miller, Master of Science in ECE 2016 - Present
 - Focus on cryptocurrencies, decentralized systems, security
- **University of Illinois at Urbana-Champaign** Urbana, IL
Bachelor of Science in ECE 2012-2016
 - Coursework: distributed systems, OS design, algorithms, computer architecture

Experience

- **Graduate Researcher at Decentralized Systems Lab** Urbana
Advisor: Andrew Miller 2016 - Present
 - Measurement of Bitcoin topology and influential miners
 - Decentralized systems security, smart contracts
- **ExoWear**
Software Engineer 2016
 - Start-up in medical technology that provides a Bluetooth device to help monitor physical rehabilitation
 - Worked on developing the core product and managed other engineers
- **Undergraduate Researcher at Depend Research Group** Urbana
Undergraduate Researcher, Advisor: Zbigniew Kalbarczyk 2015-2016
 - Attack testbed that simulates different attacks from web applications to DDoS, remote code execution, SSL vulnerabilities
- **Akuna Capital** Champaign, IL
Software Developer Intern 2015
 - C++ gateways that send buys/sells to exchange and handle book keeping

Research

- **TwistedPair: Lightweight Cryptocurrency Networking with Formal Anonymity Guarantees**
G. Fanti, S. Bakshi, S. B. Venkatakrishnan, A. Miller, B. Denby, S. Bhargava, P. Viswanath
In submission at SigMetrics 2018
- **Erays: Reverse Engineering Ethereum's Opaque Smart Contracts**
Y. Zhou, D. Kumar, S. Bakshi, J. Mason, A. Miller, M. Bailey 2018
In submission USENIX 2018 2nd Round

Projects - Github: <https://github.com/sbaks0820>

- **Battleship State Channel** IC3 Bootcamp
Solidity, Truffle, Ethereum 2018
 - Project from the IC3 Bootcamp, a Battleship game implemented as a state channel. Uses a combination of the Sprites, Pisa, Perun and L4 state channel construction.
- **microRaiden Off-chain Payment Monitoring** 2018
Solidity, Ethereum, Raiden, Python
 - Implementation of a **privacy-preserving** monitoring protocol for off-chain payment channels on Ethereum
 - **Paper with formal definitions and proofs incoming**
- **hackthiscontract.io** 2017
Solidity, Smart Contract Security
 - Interactive challenges for hacking vulnerable smart contracts and ERC20 tokens
 - Creating games where layered vulnerabilities allows adversaries to violate contract invariants
- **Dandelion++** 2017
Fork of Bitcoin Core and BIP
 - Implementation of Dandelion++ protocol that adds privacy at the p2p level of Bitcoin
 - Article about it on CoinDesk, a BIP-proposal on the Bitcoin Dec mailing list and a paper submission coming soon
- **Python-Bitcoinlib** 2017
Contributor, Bitcoin, Privacy
 - Contribution for segwit support in popular Python Bitcoin library managed by Peter Todd
- **Fair Lottery Smart Contract** 2016
Serpent Programming Language, Ethereum
 - Smart contract that implements a cryptographically fair lottery with a python simulator
- **Echo Dot Permissions Model** 2016
Java, Python Flask, AWS, Alexa Skills
 - Interacts with Alexa Skills and Microsoft Cognitive API to provide access control based on speaker recognition
- **Attack Testbed** 2015
Python, JavaScript, Docker
 - Docker testbed that allows easy creation, simulation, monitoring and replaying of attacks ranging from the application layer down to the network layer
 - Abstract paper: "Security Testbed: Scalable Infrastructure for Interactive Attack Replay and Testing of Security Monitoring Tools"
- **Galapagos** 2015
C, x86 assembly
 - Light Linux-based operation system that runs on x86 assembly with a virtual memory support, scheduling, system calls, multiple terminals, drivers
- **5-Stage Pipelined Processor** 2016
Verilog
 - Pipeline processor with branch prediction, multi-layered LRU caches, leap-frogging

- **FPGA Brick Breaker**

- System Verilog, C*

2015

- FPGA brick breaker with verilog vga monitor, keyboard driver support