

**Education**

- **University of Illinois at Urbana-Champaign** Urbana, IL  
*Advisor: Andrew Miller, PhDin ECE* 2018 - Present  
 – Focus on cryptocurrencies, decentralized systems, security
- **University of Illinois at Urbana-Champaign** Urbana, IL  
*Advisor: Andrew Miller, Master of Science in ECE* 2016 - 2018
- **University of Illinois at Urbana-Champaign** Urbana, IL  
*Bachelor of Science in ECE* 2012-2016

**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
- **Truebit**  
*Researcher* 2018 - Present  
 – Doing research into securing and designing the Truebit incentive layer and token mechanics.  
 More broad work into cryptoeconomic problems as well as implementation of incentive layer.
- **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**

- **PISA: Arbitration Outsourcing for State Channels**  
*P. McCorry, S. Bakshi, I. Bentov, S. Meiklejohn, A. Miller* 2018

- **Dandelion++: Lightweight Cryptocurrency Networking with Formal Anonymity**

- **Guarantees**

- *G. Fanti, S. Bakshi, S. B. Venkatakrisnan, A. Miller, B. Denby, S. Bhargava, P. Viswanath*  
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**

- *Solidity, Ethereum, Raiden, Python* 2018

- Implementation of a **privacy-preserving** monitoring protocol for off-chain payment channels on Ethereum
    - **Paper with formal definitions and proofs incoming**

- **hackthiscontract.io**

- *Solidity, Smart Contract Security* 2017

- Interactive challenges for hacking vulnerable smart contracts and ERC20 tokens
    - Creating games where layered vulnerabilities allows adversaries to violate contract invariants

- **Dandelion++**

- *Fork of Bitcoin Core and BIP* 2017

- 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**

- *Contributor, Bitcoin, Privacy* 2017

- Contribution for segwit support in popular Python Bitcoin library managed by Peter Todd

- **Fair Lottery Smart Contract**

- *Serpent Programming Language, Ethereum* 2016

- Smart contract that implements a cryptographically fair lottery with a python simulator

- **Echo Dot Permissions Model**

- *Java, Python Flask, AWS, Alexa Skills* 2016

- Interacts with Alexa Skills and Microsoft Cognitive API to provide access control based on speaker recognition

- **Attack Testbed**

- *Python, JavaScript, Docker* 2015

- 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"

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- **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** *2015*
  - *System Verilog, C*
  - FPGA brick breaker with verilog vga monitor, keyboard driver support