Andrew Beams

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EDUCATION

University of Pennsylvania, Philadelphia, PA   August 2019 – May 2021
Master of Science in Computer Science • 4.0/4.0
- Certificate in College and University Teaching
- Led the Security Reading Group, Member of the Distributed Systems Lab
- *TA for graduate courses:* Computer and Network Security (x2), Theory of Computation
- *Coursework:* Cryptography, Topics in Privacy and Anonymity, Topics in Cryptography
- *Privately tutored:* Discrete Math, Data Structures, Algorithms, Cryptography (among others)

University of Alabama, Tuscaloosa, AL   August 2016 – May 2018
Bachelor of Science in Computer Science • 4.0/4.0
- Outstanding Senior Award in Computer Science
- *TA for undergraduate course:* Fundamentals of Computer Science II

EXPERIENCE

Visa Research, Austin, TX (Remote)   *Senior Blockchain Engineer*   December 2021 – Current
- Primary developer of multiple research projects in the blockchain and CBDC space:
  - Participated in proposal and built a core deliverable for the Central Bank of Brazil's LIFT Challenge (https://liftchallenge.bcb.gov.br/site/liftchallenge/en)
  - Redesigned an existing web2 mobile application to support both web3 and smart cards
  - Designed and built a trustless DeFi application which consumed 100x less network fees than existing work
  - Led a team of researchers to develop and show a new use case for account abstraction on Starknet
- Implemented a novel solution for federated machine learning in the context of payment networks

Southwest Research Institute, San Antonio, TX   *Analyst (Software Engineer)*   June 2018 – July 2019
- Developed core features for a greenfield traffic management system for traffic monitoring and signal optimization:
  - Created authentication service which interfaced with client's existing infrastructure
  - Created authorization service to be compatible with end-user traffic engineer requirements
  - Created system-wide notification service to immediately propagate relevant events to traffic engineers' dashboards
  - Designed monitoring service for detecting abnormal system events
- Researched feasibility of using WiFi positioning system for detecting pedestrians in crosswalks

Center for Advanced Public Safety, Tuscaloosa, AL   *Student Developer*   March 2017 – May 2018
- Developed an internal library for quickly adding authentication and authorization functionality to projects
  - Added support for Active Directory and 2 Factor Authentication.

PROJECTS
SealPIR, github.com/abeams/SealPIR
- Updated Microsoft Research's Private Information Retrieval library to work with SEAL 6.3

PasswordPIR
- Built an application to demonstrate a novel cryptographic protocol – PIR with access control

PUBLICATIONS
Packet Scheduling with Optional Client Privacy, CCS 2021 (Virtual)   November 2021
Andrew Beams, Sampath Kannan, and Sebastian Angel

Pirmission: Single-server PIR with Access Control, In Submission
Andrew Beams, Sebastian Angel
https://eprint.iacr.org/archive/2022/1089/1661221438.pdf

Auto Payments for Self-Custodial Wallets
Andrew Beams, Catherine Gu, Srini Raghuraman, Mohsen Minaei, and Ranjit Kumaresan
https://usa.visa.com/solutions/crypto/auto-payments-for-self-custodial-wallets.html

AWARDS & CERTIFICATIONS

U.S. PETs Prize Challenge Special Recognition   March 2023
FCC Amateur Extra Class License   July 2022
Japanese Language Proficiency Test N1 Level (Business fluent)   December 2019

SKILLS

Languages: C# (Dot net core), Python, Java (Spring Boot), Solidity, C++, Javascript (Angular), SQL
Technologies: Ethereum/web3, Circom, SnarkJS, Javacard, Android TEE development, Starknet/Cairo, Blockchain, OpenAPI, Xunit, Redis, Docker, Kubernetes, MS SQL Server, Elastic Stack, Active Directory, Pandas, Spark, Wireshark, Microsoft SEAL, MCL