

# Zachary Espiritu

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## Education

### Brown University

Concurrent Sc.B. / Sc.M. in

Computer Science

GPA: 4.0 • Graduating May 2022

## Projects (more on website)

### Authorized PSI

Research with Roberto Tamassia on novel, privacy-preserving variants of MPC protocols.

### Weenix

An operating system kernel based on Unix, written in C. Features process management, file system interfaces, and virtual memory.

### GrblGrader

Modular system for grading and feedback distribution in Google Apps Script. Used by 4 CS courses, reaching ~300 students / year.

### Vehicle Routing

Local search solver for NP-hard vehicle routing problems, written in Python. Best performance out of 21 teams in graduate-level course.

### Snowy Sunrise

Real-time GPU raymarched scene featuring L-systems, screen-space volumetric lighting, and FXAA. Written in C++ and GLSL.

## Selected Coursework

Design and Analysis of Algorithms

Distributed Computer Systems

Human-Computer Interaction

Introduction to Computer Graphics

Logic for Systems (Formal Methods)

Prescriptive Analytics

Software Security and Exploitation

## Experience

### Encrypted Systems Lab

Fall 2020

Undergraduate Researcher

Working with Seny Kamara on practical multi-party computation and encrypted databases design to support public initiatives.

### Google

Summer 2020

Software Engineering Intern

Developed an open-source OpenSSL engine in C++ allowing OpenSSL-backed web servers and TLS terminators to immediately perform HTTPS signing operations with Google Cloud HSM private keys without any source code modifications.

### Brown PLT (Programming Languages Team)

Summer 2018

Undergraduate Researcher

Created a port of TensorFlow.js for Pyret, a functional scripting language designed for education. Prototyped implementations for a Pyret Jupyter notebook "kernel".

### Negotiatius

Summer 2016 and 2017

Software Engineering Intern

Built internal Ruby on Rails tools to streamline Operations team workflows. Solely developed flagship, client-facing features (*Scheduled Orders*, *Notifications Center*).

## Department Service

(@ Brown CS)

**SPOC (Systems Programmer, Operator, and Consultant)** Spring 2019 – Present

Off-hours, on-call technical staff; one of 2 undergraduates supporting and maintaining the Linux systems in the department used by students, TAs, and faculty.

**Meta Teaching Assistant (TA Program Coordinator)**

Fall 2019 – Present

Coordinates hiring and training of 600 TAs each year across 50 courses; provides technical/logistical support as one of 4 undergrads for the department TA program.

## Teaching

(\* denotes Head Teaching Assistant)

**CSCI 1660: Computer Systems Security**

Spring 2019\*, 2020\*, and 2021\*

Revamped web, OS, and secure systems design projects; created +30 new written questions related to compression, MPC, anon. networks, etc. reduced project setup times by ~92% by automating Linux VM creation on Google Compute Engine.

**CSCI 1730: Programming Languages**

Fall 2019 and 2020\*

PL with a security mindset focus. Edited and rewrote specs for 9 programming assignments; automated 60% of grading process via Gradescope autograders.

**CSCI 0190: Accelerated Introduction to Computer Science**

Fall 2018\*

**CSCI 0040: Introduction to Scientific Computing**

Spring 2018

**CSCI 0050: Data-Centric Introduction to Programming**

Fall 2017