

# Zachary Espiritu

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## Education

### Brown University

Sc.B. Computer Science

GPA: 4.0 • Graduating December 2021

## Projects [\(more on website\)](#)

### 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 for Brown CS courses written in Google Apps Script. Used in three courses, reaching ~300 students annually.

### 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

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

## Coursework

Computer Systems Security

Design and Analysis of Algorithms

Distributed Computer Systems

Human-Computer Interaction

Introduction to Computer Graphics

Logic for Systems (Formal Methods)

Operating Systems

Prescriptive Analytics

Programming Languages

Software Security and Exploitation

User Interfaces and User Experience

## Experience

### 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 new libraries and interfaces for Pyret, a functional scripting language designed for education, including a port of TensorFlow.js to Pyret.

### Negotiatius

Summer 2016 and Summer 2017

#### Software Engineering Intern

Built several internal tools in Ruby on Rails designed to streamline Operations team workflows. Solely developed flagship, client-facing features (*Scheduled Orders*, *Notifications Center*). Wrote full-system test suite from scratch with 70% coverage.

## Teaching

(\* denotes Head Teaching Assistant)

### CSCI 1660: Computer Systems Security

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

Cryptography, web, operating systems, and networks. Hired and trained staff of 10 TAs; automated staff setup for projects using Linux VMs on Google Compute Engine, reducing setup times by up to ~92%. Developed major revamps of "hacking" projects in web security, operating systems, and secure system design.

### CSCI 1730: Programming Languages

Fall 2019 and 2020\*

Design and implementation of programming languages, with a security mindset focus through opaque "mystery language" exploration assignments. Hired and trained staff of 6 TAs. Edited and rewrote several assignments.

### CSCI 0190: Accelerated Intro to Computer Science

Fall 2018\*

Functional programming, data structures, and algorithms. Hired and trained staff of 9 TAs. Organized summer placement exam for 174 students. Developed new assignments and labs, including a new "Tensorflow in Pyret" lab.

## Department Service

(@ Brown CS)

### 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 2 undergrads for the department TA program. Provided department-wide support for COVID-19 remote learning transition.

### SPOC (Systems Programmer, Operator, and Consultant)

Spring 2019 – Present

Off-hours, on-call technical staff; one of 5 undergraduates supporting and maintaining the Linux systems in the department used by students, TAs, and faculty.