

# Zachary Espiritu

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## Education

**Brown University**  
**Sc.B. Computer Science**  
GPA: 4.0 • Graduating December 2021

## Skills

### Languages

Ruby • C • Python • JavaScript •  
Pyret • Racket • HTML / CSS •  
Bash • Go • C++ • MATLAB

### Technologies

Rails • Sass • jQuery • Heroku •  
Firebase • PostgreSQL • LaTeX

### Formal Methods

Alloy Analyzer • TLA+ • Z3 •  
IBM CPLEX Optimization Studio

### Prototyping and Design

Sketch • Figma • InDesign •  
Photoshop • Adobe XD

## Coursework

Computer Systems Security  
Design and Analysis of Algorithms  
Discrete Structures and Probability  
Introduction to Computer Systems  
Introduction to Computer Graphics  
Logic for Systems (Formal Methods)  
Operating Systems  
Prescriptive Analytics  
Programming Languages  
User Interfaces and User Experience

## Experience

**Brown Computer Science Department** Spring 2019 – Present  
**SPOC (Systems Programmer, Operator, and Consultant)**

- On-call technical staff. Provides support and maintenance for Linux systems in the department used by students, teaching assistants, and faculty.

**Brown PLT (Programming Languages Team)** Summer 2018  
**Undergraduate Researcher**

- Ported TensorFlow.js to Pyret to allow for Pyret programs with machine learning.
- Implemented a Pyret kernel for the Jupyter messaging protocol in JavaScript, allowing for the creation of Pyret “notebooks” and a command-line Pyret REPL.

**Negotiatus** Summer 2016 and Summer 2017  
**Software Engineering Intern**

- Built several tools and interfaces in Ruby on Rails designed to automate and streamline Operations team workflows and improve overall company efficiency.
- Optimized PostgreSQL queries for up to ~500x faster product catalog searches.
- Designed and developed new features (*Scheduled Orders*, *Notifications Center*).

## Teaching

(\* denotes Head Teaching Assistant)

**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 leaders for the department TA program.

**CSCI 1660: Computer Systems Security (\*)** Spring 2019 and Spring 2020

- Hired, trained, and coordinated staff of 8 TAs; automated staff setup for course projects using Google Compute Engine API, reducing setup times by up to ~92%.
- Redesigned, modernized, and developed new hands-on, “hacking” projects on web security and Unix/Linux operating system security for Spring 2020 offering.

**CSCI 0190: Accelerated Intro to Computer Science (\*)** Fall 2018

- Hired and trained staff of 9 TAs for functional programming, data structures, and algorithms in Pyret. Organized placement exam and grading for 174 students.
- Developed new assignments and labs, including a new “Tensorflow in Pyret” lab.

## Projects

(more at zacharyespiritu.com)

### Weenix, “Operating Systems” Semester Project

A full operating system kernel in C, based on Unix. Built as a semester-long project.

### GrblGrader

Modular, customizable system for grading and feedback distribution for Brown CS courses written in Google Apps Script. Currently used in three courses annually.

### Vehicle Logistics Local Search, “Prescriptive Analytics” Final Project

Solver for NP-hard vehicle routing problems with storage capacity and maximum distance constraints, written in Python. Best performance out of 21 teams.

### Snowy Sunrise, “Introduction to Computer Graphics” Final Project

Two-person project in C++ and GLSL; a real-time GPU raymarched scene featuring L-systems, screen-space volumetric lighting, and fast-approximate anti-aliasing.