

Tim O'Brien

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Education

Vanderbilt University

Nashville, TN

B.S. IN COMPUTER SCIENCE | B.A. IN APPLIED MATHEMATICS AND FRENCH

Expected May 2021

- **Cumulative GPA:** 3.95/4.00 | **Computer Science GPA:** 4.00/4.00
- **Relevant Coursework:** Algorithms (in progress) | Intermediate Software Design | Operating Systems | Programming Languages
- **Honors and Awards:** Clark Scholarship - given to high-achieving, low-income engineering student leaders with a focus on business and service Dean's List (all semesters) | National Merit Scholarship Award Winner | USA Physics Olympiad Bronze Medalist

Work Experience

Vanderbilt University Department of Computer Science

Nashville, TN

TEACHING ASSISTANT FOR DATA STRUCTURES AND INTERMEDIATE SOFTWARE DESIGN

Aug. 2018 - Present

- Hold office hours twice a week to teach 150+ students elements of C++ including data structures, patterns, and the Standard Template Library.
- Grade student assignments and exams for Program Design and Data Structures (Fall 2018) and Intermediate Software Design (2019).

Itopia

Miami, FL

SOFTWARE ENGINEERING INTERN

May. 2019 - Aug. 2019

- Built portal with TypeScript and Angular to allow the support team secure view access to cloud organizations and deployments using a REST API.
- Implemented back end as an addition to the existing internal site with Firebase authentication to only grant portal access to privileged users.
- Employed HttpInterceptor to allow read-only access for all outgoing API requests by adding an authorization string as an OAuth 2.0 Bearer Token.
- Integrated portal into front end using Router with child routes to create a single page application and guards to prevent unwanted navigation.
- Adapted Material table by creating a custom component and datasource, enabling server-side pagination and filtering to clearly render cloud data.

Institute for Software Integrated Systems at Vanderbilt University

Nashville, TN

SUMMER RESEARCH INTERN

May. 2018 - Aug. 2018

- Created a decentralized application (DApp) that uses Solidity smart contracts to securely share patient prescription histories for addiction treatment.
- Developed using Node.js and Web3.js to interface with smart contracts, Firebase to handle storage, and JSON Web Tokens to share patient data.
- Designed front end using React.js: Create React App, React Bootstrap, and React Router to create buttons, forms, and links with HTML and CSS.
- Explored potential for AWS Distributed Ledger Technology to facilitate secure sharing by configuring Amazon cloud computing like EC2 and VPC.

Projects

Integreat

Jun. 2019 - Jul. 2019

- Created calculator Android app using Kotlin and Volley with the Newton calculus API to allow the user to evaluate basic integrals and derivatives.

Markov Chain Cut-ups

Dec. 2018

- Developed Markov Chain-based text generation in C++ to produce passages based on the works of different authors of the Beat Generation.
- Used std::filesystem to read authors' works from a directory and load them word-by-word into a hash map. Randomly shuffled the order of generated sections to create a new text output file, emulating the cut-up technique of Beat Generation author William S. Burroughs.

C++ Test-Driven Development Projects

Aug. 2018 - Dec. 2018

- Implemented strongly exception-safe STL members in C++ using templates: vector, linked list, stack, queue, unique pointer, and iterator.
- Adhered to software design patterns to build model solar system simulating interplanetary motion and expression tree-based calculator.

Extracurricular Activities

VandyHacks

CONTENT TEAM

Aug. 2017 - Present

- Develop workshops to teach various technologies, such as natural language processing, at local Hack Nights and annual 650+ student hackathon.

Vanderbilt Student Volunteers for Science

VOLUNTEER

Jan. 2018 - Present

- Teach hands-on science and robotics lessons to students in grades 5-8 weekly in class and at after-school programs throughout the Nashville area.

Vanderbilt Men's Ultimate

CLUB TEAM MEMBER - CUTTER

Aug. 2017 - Present

- Attend practice twice a week for a total of 5 hours and participate in weekend club tournaments each month throughout the Southeast and Midwest.

Skills and Interests

Foreign Languages | Professional working proficiency in French | Limited working proficiency in Russian

Programming Languages | **Proficient:** C++ | TypeScript | **Experienced:** C | Java | Node.js | **Familiar:** Racket | Python

Interests and Hobbies | Ultimate Frisbee | Natural language processing | Cooking | Online multiplayer games | Basketball | Weightlifting