

# Tim Fitzpatrick

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## EDUCATION

**University of Notre Dame**, Notre Dame, IN  
*Bachelor of Science in Computer Science*

**May 2023**  
**GPA: 3.41**

## TECHNICAL PROJECTS

**Online Chatroom/Messenger App**, Palm Desert, CA  
*MERN Stack Web Application*

**January 2023**

- Developed an online chat interface which allowed users to private message, join chat rooms, and add friends using React.js
- Designed a backend API that supported real time messaging with web sockets, MongoDB database interaction with Mongoose, and protected access to API routes with JSON Web Tokens (JWTs) using Express.js
- Formulated a MongoDB database schema to maintain information about users, chatroom history, and message history

**B-Minor Compiler Project**, Notre Dame, IN  
*Compilers*

**August 2022 – December 2022**

- Translated code from a C-like language called B-Minor into an assembly code executable by using C to model the compiler pipeline
- Implemented a lexer and parser to group code into tokens and expressions, an abstract syntax tree (AST) to verify structural correctness, a type-checker to ensure semantic correctness, and then finally a code generator to build an executable file
- Analyzed assembly language optimizations, such as loop unrolling and code hoisting, to improve the efficiency of executable code

**Fitness Progress Tracker**, Palm Desert, CA  
*React Native Mobile Application*

**August 2022**

- Created a cross-platform mobile application for helping users in their personal fitness journey by providing tools to create personalized exercise routines, log their results, and view their progress
- Provided users with an intuitive interface and additional health and fitness information that increased functionality

**Muse Project**, Notre Dame, IN  
*Database Systems*

**August 2021 – December 2021**

- Developed a web application that provided users with song/artist recommendations based on preferences to explore new music and interfaced with Spotify so that users could easily add songs and artists to their library
- Protected users and their personal information through implementing OAuth 2.0 authentication protocol
- Maintained a backend MySQL database and designed PHP queries to implement our recommendation system and provide users with additional statistics related to their music

**Facial Recognition Project**, Notre Dame, IN  
*Computer Vision*

**August 2021 – December 2021**

- Utilized the OpenCV Python library to pre-process images and detect faces, recognize faces using an LBPH classifier, and train a facial recognition model using a set of control data
- Achieved a 93% success rate for facial recognition when provided an image of a person in our dataset that was not included in the model training
- Implemented real-time facial detection and recognition by using a webcam to capture the user's face and updating our facial recognition model to include the user

## WORK EXPERIENCE

**University of Notre Dame**, Notre Dame, IN  
*Computer Science Tutor – Self Employed*

**March 2022 – Present**

- Instructed high school students taking introductory computer science classes on a weekly basis over zoom and tailored individual lesson plans to the assignments and projects for each student
- Collaborated with parents to track academic progress and used this information to address specific areas for improvement

**University of Notre Dame**, Notre Dame, IN  
*Undergraduate Teaching Assistant – Data Structures*

**January 2022 – May 2022**

- Assisted students in understanding complex data structures concepts by holding office hours and providing strategies and programming tips to work through coding assignments
- Collaborated with the professor and other TAs to create supplementary materials for students to use

## LEADERSHIP & ACTIVITIES

**Stanford Hall Intramural Basketball**, Notre Dame, IN  
*Team Captain*

**January 2020 - Present**

- Coordinated team meetings, practices, and team events, represented the team at league meetings, and competed against other dorms during a six-week season while balancing a rigorous academic schedule

**Big Brothers Big Sisters of America**, Palm Desert, CA  
*Big Brother*

**September 2016 – May 2019**

- Mentored an eight-year old twice a week to guide his path into adolescence while balancing high school and varsity track
- Arranged tutoring sessions and extracurricular activities by communicating with parents and the Big Brother organization

## TECHNICAL SKILLS

**Skills** – C | C++ | Python | Oracle/SQL | JavaScript | React | React Native | HTML and CSS | AWS | Linux | Microsoft Office  
**Interests** – AZ Cardinals | LA Lakers | Weightlifting | Snowboarding | Video Games | Nutrition | Hiking | Chipotle