# Brandon Ho

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## Education

- **University of California San Diego** — La Jolla, CA
  *Bachelor of Science in Computer Engineering, Regents Scholar* — *Aug. 2020 – July 2024*
- **Westview High School** — San Diego, CA
  *High School Diploma* — *Aug. 2016 – June. 2020*
  - Cumulative GPA: 4.49/4.0 — SAT: 1550/1600 — PSAT: 1490/1520
  - Honors: National Merit Corporate Scholarship Recipient, National AP Scholar, National Honor Society
- **Coursework**
  - **CS50AI**: CS50's Introduction to Artificial Intelligence with Python — **Issued**: HarvardX, July 2020
  - **PH526x**: Using Python for Research — **Issued**: HarvardX, June 2020

## Experience

- **UCSD Department of Nanoengineering** — Bae Research Group
  *Research Assistant* — *Aug 2020 - Present*
  - **Role**: Researching hydrogel mechanics, specifically providing further insight to methods and properties of programmable hydrogels for real world applications (neurotechnology, soft robotics, etc.).
  - **Literature exploration and analysis**: Searching through scientific journals for lab studies and research project. Self-learning emerging field of hydrogel mechanics.
  - **Research Project**: Researching and writing manuscript for novel methods to engineer and design mechanically responsive, ionic conducting hydrogels (conductive hydrogel actuation).
- **FIRST Robotics Team (FTC #8742)** — San Diego, CA
  *President, Hardware Executive* — *Aug 2016 - Aug 2020*
  - **Role**: Led team to compete in the FIRST Tech Challenge Robotics Competition, building and programming a robot to reliably complete a set of tasks. Oversaw software system integration with hardware (sensors).
  - **3D Modeling**: Used 3D modeling environment, AutoDesk Inventor, to design numerous chassis and functional attachments. Primary 3D designer on the team.
  - **OpenCV**: Utilized OpenCV library for on-bot image recognition for autonomous robot functionality.
  - **PID Control**: Proportional–integral–derivative controller, a feedback control loop mechanism used to more accurately control robot maneuvers. Developed PID control for robot with sensor data (encoder counts, gyro).

## Projects

- **PersonAI** — SPIS Program
  *AI Chatbot with Customizable Personas (backend for chat site, ProfessorUWU).* — *Aug 2020*
  - **TensorFlow/OpenAI GPT**: Implemented TensorFlow with OpenAI GPT's Transformer-based language model on custom dialogue datasets to create custom personas for users to chat with.
  - **Emotion Classification**: Created phrase emotion classifier by implementing an sklearn pipeline on a labeled Twitter dataset. Used model to give the chatbot broader emotional qualities (empathy).
- **Doodle** — Personal Project
  *Multi user drawing-charades environment with an emphasis on server-client communication.* — *June 2019*
  - **Server/Client Communication**: Built a server-client class to manage multiplayer functionality with customized send and receive functions. Used net package from Java (ServerSocket and Socket).
  - **Data Encryption/Decryption**: Implemented text encryption/decryption architecture to easily send game states and images between server and clients.
- **Overcooked** — Personal Project
  *Cooking virtual experience with an emphasis in smooth animation and object collision.* — *March 2019*
  - **GUI Development**: Utilized Swing package from Java to create interactive GUI (JPanel, JFrame, JLabel, etc).
  - **Object Oriented Programming**: Built many custom game objects to keep track of and change object states and properties in clean and concise code.

## Skills and Interests

- **Programming Languages:** Python, Java, HTML, C++, Git **Technologies:** Adobe, AutoDesk, AWS
- **Interests:** Machine Learning, Fullstack Development, Robotics, Backpacking, Volunteering
- **Awards:** Eagle Award, President's Volunteer Service Award (Gold)