**Jeffrey Tsaw**

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**EDUCATION**

**Carnegie Mellon University – College of Engineering Pittsburgh, PA**

*B. S. in Electrical and Computer Engineering May 2021*

* QPA: 3.92 | Dean’s List Fall 17-18
* Courses: Principles of Imperative Computation, Structure and Design of Digital Systems,

Introduction to Computer Systems, Signals and Systems

**PROJECTS**

**BMO – Interactive Portable Gaming Console Pittsburgh, PA**

*Software Developer, Manufacturing Engineer January 2019*

* Designed and developed an interactive portable gaming console containing Tetris, Snake and Breakout on JavaScript, which ran on a Raspberry Pi powered by Windows IOT
* Integrated Katspaugh IPA API, and ResponsiveVoices.js API to create an interactive assistant that mimics human speech patterns
* Manufactured a surrounding case using acrylic and 3D printed resin to create a retro Gameboy case with operating buttons

**The Empathetic Jukebox – 15-112 Term Project. Pittsburgh, PA**

*Software Developer April 2018 – May 2018*

* Created a music player that plays songs from user’s playlists on Spotify based on user’s emotions using Python, OpenCV, and BeautifulSoup
* Integrated machine learning in OpenCV to detect facial emotions, as well as Spotify API with web scraping to play the songs from YouTube

**CrackHQ Trivia Solver Pittsburgh, PA**

*Software Developer February 2018*

* Integrated Microsoft Azure’s OCR, NLP, and Bing Search API to create a context aware environment that solves questions from the HQ Trivia Game using JavaScript and React.js
* Worked collaboratively and designed back-end and front-end over a 24 hour period

**VGA Breakout Pittsburgh, PA**

*Hardware Developer November 2018*

* Designed and developed the game breakout using System Verilog, and synthesized the working game to an FPGA, and included features such as paddle AI, and selective ball velocity
* Integrated a VGA display that was synthesized using the FPGA

**PROFESSIONAL EXPERIENCE**

**Bettinger Group – Carnegie Mellon University. Pittsburgh, PA**

*Principal Investigator May 2018 – Present*

* Designed less invasive and more efficient flexible gel-based neural probes through investigating conductivity of gold nanostructures under strain on a flexible substrate under guidance from Professor Christopher Bettinger
* Discovered a relationship between path length of nanostructures and conductivity at varying degrees of strain

**EXTRACURRICULAR ACTIVITIES**

**Academic Development – Carnegie Mellon University Pittsburgh, PA**

*EXCEL Leader September 2018 - Present*

* Designed and lead supplementary classes for Calculus 3 and Physics II for multiple groups of 10 students
* Developed proficiency in communication and organizational skills through engaging with students and finding creative ways to explain challenging topics

**SKILLS**

**Languages:** English (Native), Mandarin (Native), Cantonese (Native), French (Intermediate), Russian (Elementary)

**Technical Skills:** Python, C, JavaScript, System Verilog, MATLAB, AutoCAD, Microsoft Excel,

**Interests**: Math, Hockey, Tennis, Jazz, Football

**AWARDS AND ACHIEVEMENTS**

* Virginia Tech Regional Math Competition 2017: Top 50%
* AMC 12A 2016: 126/150, Distinguished Honor Roll (Global top 1%) | AIME II 2016: 7

**MIT PRIMES AoPS CrowdMath Research Project AoPS, Online**

*Research Contributor* Aug 2016 – May 2017

* Contributed to an online research project investigating bounds on parameters of minimally non-linear patterns and matrices.
* Published a paper titled “Bounds on Minimally Non-Linear Patterns” in the Electronic Journal of Combinatorics

**HackCMU Pittsburgh, PA**

*Participant* September 8 – 9 2017

* Created a variant of the game Chess called Chess960 (Chess but entire back row is randomized)
* Gained knowledge and experience with animation and game design with Python and Tkinter

**CMU Solar Racing Pittsburgh, PA**

*Participant* September 2017 – Present

* Member of Power team, designing and implementing a solar power grid to power the boat
* Member of New Member team, creating a small-scale boat using glass-fiber overlays

**Cornwall Contracting Co. Ltd Hong Kong, HK**

*Intern June 2017 – July 2017*

* Edited electrical blueprints of the M+ project in Hong Kong using AutoCAD software
* Collaborated with suppliers, and other contractors to create a finalized project schedule

**CMU ChemE Car Pittsburgh, PA**

*Participant September 2017 – Present*

* Built a stopping mechanism for a car based on the kinetics of Manganese Dioxide and Hydrogen Peroxide reaction utilizing a gas syringe and an Arduino to track gas production.
* Granted $1000 SURG to improve reliability of gas production, as well as delivery methodologies

**Rethink the Rink – Covestro, Pittsburgh Penguins, Carnegie Mellon Make-a-thon Pittsburgh, PA**

*Innovator March 2018*

* Developed, prototyped and presented a unique innovative solution to making hockey boards safer over a week long make-a-thon in teams of 5
* Created a prototype using Covestro materials, and presented it to a panel of Covestro materials experts, Pittsburgh Penguins staff, and engineering professors
* Voted ‘Most Innovative Design’ by panel of experts