

# Jason Chadwick

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## EDUCATION

**Carnegie Mellon University, Pittsburgh, PA**

**Expected May 2022**

Bachelor of Science in Physics, minor in Computer Science

GPA 3.95 (CS GPA 4.0)

**Relevant coursework:** Artificial Intelligence, Parallel and Sequential Data Structures and Algorithms, Advanced Quantum Physics, Computer Systems, Quantum Computing.

## EXPERIENCE

**Quantum Computing Researcher, University of Chicago, IL (remote)**

**Feb 2021 – Present**

- Simulated quantum systems in Julia to find optimal durations for quantum logic gates.
- Found new implementations of quantum gates with up to 10x speedups.
- Collaborated with researchers from UChicago, UC Berkeley, and LLNL.
- Developing a quantum compiler in Python to implement our optimizations.
- Co-authoring a research paper on findings and presenting a poster at QIP 2022.

**Machine Learning Intern, Princeton Plasma Physics Laboratory, NJ (remote)**

**May – Dec 2020**

- Developed a neural network with TensorFlow to predict fusion plasma profiles using real-time data to improve performance of real-time control systems in fusion reactors.
- Achieved prediction accuracy of over 90% while drastically reducing prediction time.
- Integrated reliable uncertainty estimation and explored active learning techniques.
- Published in *Nuclear Fusion* and presented at 2020 APS Plasma Physics conference.

**Cosmology Research Intern, Tufts University, MA**

**May – Aug 2019**

- Computed gravitational wave power and frequency of cosmic strings in Common Lisp.
- Calculated target power and frequency values to guide future observation research.
- Analyzed stability of certain cosmic string loops mathematically.

## ACTIVITIES

**Linear Algebra and Differential Equations Tutor**

**Jun 2021 – Present**

- Explaining advanced math concepts to physics and math students.

**Physics Steering Committee Member**

**Feb 2020 – Present**

- Collaborating with physics department leadership to improve curriculum and community.

**Lead Push Captain and Mechanic, Fringe Racing**

**Fall 2018 – Present**

- Designing and building an unpowered carbon fiber racing vehicle for an annual CMU event.

## PUBLICATIONS AND PROJECTS

**Neural network paper**

- M.D. Boyer, **J. Chadwick**. "Prediction of electron density and pressure profile shapes on NSTX-U using neural networks." *Nuclear Fusion*. [doi.org/10.1088/1741-4326/abe08b](https://doi.org/10.1088/1741-4326/abe08b).

**Chronodrifter** - puzzle game where the player can manipulate the direction of time (work in progress)

- Developed a Unity puzzle game involving manipulation of time. Designed challenging and creative game levels based on this concept. [jasonchadwick.github.io/chronodrifter/](https://jasonchadwick.github.io/chronodrifter/).

## SKILLS

**Languages:** Python (+TensorFlow, pandas, sklearn), Java, C/C#, Julia, Clojure, Lisp, SML, Bash.

**Techniques:** Machine learning, linear programming, data analysis, functional programming.

**Software:** Unix, Unity, Mathematica, slurm, git.