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, Discrete Differential Geometry.

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.

Chronodrifter - *puzzle game where the player can manipulate the direction of time (work in progress)*
- Developed a Unity puzzle game involving manipulation of the direction of time. Designed challenging and creative game levels based on this concept. Managed a team of collaborators on the project. placeholder-studios-dev.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.