

Adam I. Cardoza

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Education

Brigham Young University

Provo, UT

Ph.D in Mechanical Engineering

Expected graduation April 2027

- Dissertation topic: Enabling Unsteady Aerostructural Wind Turbine Blade Design Optimization via Analytical Gradients and Machine Learning
- Advisor: Andrew Ning

B.S. in Mechanical Engineering

Graduated April 2020

- Minors in Math and Ballroom dance
- Member of the Ballroom Dance Company

Professional Experience

Brigham Young University

Provo, UT

Graduate Student Researcher

April 2020 – Present

- Develop aeroservoelastic software for gradient-based optimization.
- Design approaches for physics-based deep learning surrogate modeling.
- Write scientific articles on theoretical advancements and experimentation.

Teaching Assistant

Aug 2016 – Present

- Offer student support in a variety of undergraduate and graduate classes including Newtonian mechanics, engineering statics, system dynamics, fluid mechanics, flight vehicle design, design optimization methods, and deep learning for engineers.
- I help students in one-on-one and group settings understand course concepts, develop problem solving skills, and navigating the major.
- Provided in-class support to ensure quality education in hybrid learning environments during the pandemic.
- Graded student work and provided meaningful feedback so they can improve.
- Occasionally taught lectures.

Undergraduate Research Coordinator

Jan 2023 – April 2026

- Led the design, coordination, and instruction of a one-on-one undergraduate research skills course.
- Contributed to three major curriculum redesigns. The current iteration emphasizes cultivating the skills and dispositions essential for academic research.
- Oversaw the full student lifecycle-from application review and approval through strategic mentor matching based on research interests, availability, and skill level.
- Mentored graduate student instructors while maintaining an active teaching role in the course.

Undergraduate Research Assistant, FLOW Lab April 2018 – April 2020

- Designed two unique test harnesses to compare efficacy of aerodynamic analyses programs.
- Implemented methods in a basis spline program to implement new airfoil parameterization methods for smooth optimization.
- Analyzed a wind turbine using blade element momentum theory and compared against unsteady experimental data.

Undergraduate Research Assistant, Clean Water Lab May 2018 – Dec 2018

- Found and compiled research articles for literature review.

NASA Ames Research Center Mountain View, CA

Aeromechanics Research Intern June 2023 – Aug 2023

- Collected open source information about a current eVTOL aircraft and analyzed it using the NASA Design and Analysis of Rotorcraft software (NDARC) to verify performance claims under the mentorship of Chris Silva and Wayne Johnson.
- Mentored three high school interns during their internship.
- Provided technical advice to several other interns on topics including electronics, aircraft design, structural mechanics, and coding.

Publications

Peer Reviewed Journal Articles

Adam Cardoza and Andrew Ning, “Efficient derivative computation for unsteady fatigue-constrained nonlinear aero-structural wind turbine blade optimization”, Wind Energy Science, Vol. 11, No. 4, pp.1487-1504, Apr. 2026. doi:10.5194/wes-11-1487-2026

Conference Articles

D.G. Caprace*, Adam Cardoza, Andrew Ning, Marco Mangano, SiCheng He and Joaquim R. R. A. Martins, “Incorporating High-Fidelity Aerostructural Analyses in Wind Turbine Rotor Optimization”, AIAA SciTech 2022 Forum, San Diego, CA, Jan. 2022. doi:10.2514/6.2022-1290

Taylor McDonnell, Adam Cardoza*, D.G. Caprace, and Andrew Ning, “A General Coupling Methodology for Unsteady Aerostructural Optimization with Analytic Derivatives”, AIAA SciTech 2022 Forum, San Diego, CA, Jan. 2022. doi:10.2514/6.2022-1291

*presenting author

Presentations

“Unsteady aerostructural blade optimization with analytic gradients”, NAWEA 2023 WindTech Conference

Mentoring Experience

Graduate student

Weston Pace - PhD Student - April 2025 – present

Undergraduate students

Zachary Twitchell

Elise McConlogue

Ben Linford

McKay Hoffmann

Petr Tupitsyn

Janet Wong

Sam Nasman

Weston Pace

Jacob Child

Tanner Oldham

Gregory Devenport

Affiliations

- American Institute of Aeronautics and Astronautics (AIAA)

Extracurricular / Service

Church of Jesus Christ of Latter-day Saints

Chinese Language Missionary – New York, New York South Jan 2013 – Jan 2015

- Taught several levels of English language courses. Two focusing on navigating life using English and one focusing on preparing for college applications.
- Provided translation support in meetings, interviews, and when individuals needed help interacting with government officials.
- Led and instructed a small team of missionaries in pursuit of their purpose.