Conor Rowan

conor.rowan@colorado.edu ⋄ 484-919-8892 ⋄ Personal Website

EDUCATION

University of Colorado Boulder   Boulder, Colorado
Aerospace Engineering PhD Student (coadvised by Professors Alireza Doostan and Kurt Maute)   08/2022 - Present

Dartmouth College   Hanover, New Hampshire
Bachelor of Engineering in Mechanical Engineering   06/2016 - 06/2019

Bard College at Simon's Rock   Great Barrington, Massachusetts
Bachelor of Arts in Mathematics   09/2014 - 06/2018

RESEARCH INTERESTS

- Computational damage and fracture modeling
- Multiscale solid mechanics
- Data-driven modeling
- Complex systems
- Philosophy of science

PROFESSIONAL EXPERIENCE

Boeing Commercial Airplanes   Seattle, Washington
Liaison Engineer   09/2019 - 07/2022

- Attained Boeing Material Review Board (MRB) authority via nine-month rotation program through four fabrication and assembly facilities
- Liaison between manufacturing and design to troubleshoot production issues and ensure part compliance to engineering requirements for 737, 747, 767 and 777 airplane programs
- Learned theory and practice of fabrication, inspection, and repair of large monolithic aluminum airplane parts
- Lead a number of independent physics-based modeling and process improvement projects (see "Projects & Presentations")

Boeing Commercial Airplanes   Frederickson, Washington
Production Engineering Intern   06/2018 - 09/2018

- Statistically analyzed production data to predict CNC mill correction factors on wing structure
- Gained proficiency with Geometric Dimensioning and Tolerancing (GD&T) and complex engineering drawings

Metal Alloy Heat Treatment Research   Hanover, New Hampshire
Research Assistant   03/2017 - 06/2017

- Annealed samples and measured/calculated optical performance metrics for metal alloys to be used in solar energy applications

TEACHING & MENTORING EXPERIENCE

Graduate Student Mentor   Boulder, Colorado
University of Colorado Boulder, Aerospace Engineering   08/2023 - Present

- Mentor for incoming first-year aerospace masters and PhD students

Working in Industry   Boulder, Colorado
Herbst Program for Engineering, Ethics & Society   05/2023

- Gave a presentation and moderated a discussion about working in engineering industry for undergraduates in an engineering leadership program

Teaching Assistant
University of Colorado Boulder, "Statics, Structures & Materials"

Boulder, Colorado
08/2022 - 12/2022

- Lead problem sessions, graded assignments, and helped with administration of large sophomore level aerospace course

Tutor
Dartmouth College, Engineering prerequisite courses

Hanover, New Hampshire
03/2019 - 06/2019

- Ran a weekly help session for homework assignments in calculus, physics, and computer science

Teaching Assistant
Dartmouth College, "Engineering Systems"

Hanover, New Hampshire
01/2019 - 03/2019

- Lead problem sessions and graded assignments

PROJECTS & PRESENTATIONS

The Myth & Science of Weather
The ATLAS Institute, Jupyter Notebook & Presentation

12/2023

- Constructed 2D incompressible Navier-Stokes solver in MATLAB using Chorin's method to generate data and visualizations for a philosophy of science themed project exploring the relationship between technology and storytelling

Two-way Coupled Viscoelastic Torsion and Heat Conduction
Civil Engineering, Course Final Project

12/2023

- Implemented custom two-way coupled MATLAB solver for torsional vibrations of viscoelastic rod which is heated by dissipated mechanical energy

What is a Model?
Fluids, Structures & Materials Seminar, Presentation

11/2023

- Made and delivered presentation to introduce aerospace engineering graduate students to canonical topics in the philosophy of science such as model construction, the problem of induction, falsification, the Duhem-Quine thesis, and Kuhn's critique of scientific progress

Learning Energies in Phase Field Model of Fracture
Aerospace Engineering, Research Progress Report

10/2023

- Implemented custom anisotropic phase field damage model in MATLAB and showed that the fracture energy function can be learned from data

Phase Field Model of Fracture
Aerospace Engineering, Presentation

10/2023

- Motivated the importance of computational damage models through a brief history of fracture mechanics, introduced phase field model and demonstrated how its variational structure makes it a popular approach to damage and fracture modeling

Classical and Computational Fracture Mechanics Literature Review
Aerospace Engineering, Presentation

09/2023

- Compiled survey of history of fracture mechanics including extensive literature review of modern damage and fracture models

Asymptotic Homogenization & Machine Learning
Aerospace Engineering, Research Progress Report

06/2023

- Implemented 2D linear elastic homogenization code in MATLAB to compute microstructural stress fields and effective properties, used simulation data to build machine-learning surrogate models with PyTorch

Thermoelastic Kirchhoff Plate: An Analytical Model for Skin Panel Shot Peen Forming   02/2022
Boeing Commercial Airplanes, Report & Presentation

- Developed novel thermoelastic plate model for shot peen forming, derived and numerically implemented solution to governing equations, designed and carried out factory experiments, validated theoretical model using test results and Monte Carlo uncertainty estimation, formulated inverse method to calculate loads required to generate specified displacements

Plastic Bending Model of Stringer Forming

Boeing Commercial Airplanes, Report & Presentation   08/2021

- Initiated step towards automation of manual stringer forming by using plastic bending theory to compute the relationship between applied forces and permanent bending displacements

Beam Bending Model of Rib Chord Shot Peen Rework

Boeing Commercial Airplanes, Report & Presentation   04/2021

- Created physics-based model of shot peen straightening process to improve accuracy and efficiency of reworking beam-like wing structure

Clustering Analysis of Stringer Thickness Data

Boeing Commercial Airplanes, Presentation   08/2020

- Lead process improvement project using clustering algorithms to refine machine performance and devised more robust part variability metrics

Publications

- *Danger of Deepfakes Extend Far Beyond Misinformation*, Colorado Engineer Magazine, Spring 2023
- *Human Systems and Complexity*, Colorado Engineer Magazine, Fall 2023

Honors and Awards

- 2023 recipient of National Defense Science and Engineering Graduate (NDSEG) fellowship
- Second place in annual interdisciplinary tech ethics competition hosted by the Wolf Law School at CU Boulder
- KD Woods scholarship for past academic achievement
- Colorado Engineer Magazine writer's scholarship
- Boeing "Material Review Board" (MRB) certification
- Highest honors for undergraduate thesis "Role of Dimensionality in Physics"
- Merit scholarship from Bard College at Simon's Rock

Miscellaneous

- Participant in regular meetings of "philosophy of technology" reading group and "tech & myth" salon
- EMT, Wilderness EMT, and AIARE I avalanche certifications
- Avid rockclimber and mountaineer
- Completed 1,000 mile unsupported bike tour around Iceland
- Fluent in Spanish
- Bassist in three bands active in the Boulder/Denver area
- See personal website for blog style writing, notes on continuum mechanics, and to access projects