
GREG VIEIRA

Fort Collins, CO
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I am a persistent and results-driven analytical problem solver, adept at leveraging my resourcefulness and adaptable communication skills to effectively identify and implement optimal solutions for a diverse range of challenges.

EXPERIENCE

RESEARCH ASSISTANT

Colorado State University | Fort Collins, CO
2021 – PRESENT

As a research assistant, I specialized in investigating combustion engines, alternative fuel sources, and component design within the realm of pipeline and natural gas engines and infrastructures. I conducted comprehensive research, analyzed data, and contributed to the development of innovative solutions aimed at decreasing emissions and enhancing engine performance and efficiency. Through collaboration with academic and industry partners, I acquired valuable insights into cutting-edge technologies and methodologies, furthering advancements in sustainable natural gas transportation systems.

DESIGN/SIMULATION ENGINEER

Prometheus Applied Technologies | Fort Collins, CO
June 2024 - December 2024

In my role as a Simulation and Design Engineer at Prometheus Applied Technologies' high-speed research and development team, I lead the development of innovative combustion solutions for internal combustion engines. My responsibilities span the full design process from conception to production, involving solid modeling, Computational Fluid Dynamics (CFD), and Thermal Finite Element Analysis (FEA). I thrive in this multi-disciplinary role, driving projects from the initial concept to final production stages, ensuring both precision and efficiency.

Key Responsibilities:

- Lead CFD and FEA engineering tasks, including simulation setup, data management, result analysis, and dissemination of findings through detailed presentations.
- Develop simulation-based solutions that address real-world problems, enhancing engine performance and efficiency.
- Work independently and collaboratively, contributing effectively to team goals and consistently meeting project deadlines.

OPERATIONS DIRECTOR

Saccani Dist. Co. | Sacramento, CA
2012 – 2019

As the warehouse director, I oversaw all aspects of warehouse operations, including inventory management, product ordering, loading, unloading, and organization within a multi-storage facility. With a team of over a dozen personnel under my supervision, I implemented efficient strategies to optimize workflow and ensure timely fulfillment of orders. Additionally, I maintained meticulous inventory records and implemented safety protocols to uphold a secure and productive working environment.

EDUCATION

DOCTOR OF PHILOSOPHY (PHD) IN MECHANICAL ENGINEERING, FOCUS IN COMBUSTION ENGINES AND ALTERNATIVE FUEL OPTIONS

Colorado State University, Fort Collins, CO

Expected Date: Jan 2026

- Relevant coursework: Advanced fluid dynamics, advanced heat transfer, advanced thermodynamics, industrial engines, internal combustion engines, combustion, turbomachinery
- GPA: 3.76

BACHELOR OF SCIENCE IN MECHANICAL ENGINEERING, FOCUS IN RENEWABLE ENERGIES

California State University, Sacramento, CA

May 2021

- Member of ASME
- Deans Honor Roll
- Relevant coursework: Mechanics of materials, dynamics, machine design I and II, circuits, manufacturing processes, thermal fluids, solar, bio, and geothermal engineering
- GPA 3.75

PROJECTS

Hydrogen fuel blending on a large bore 2-stroke natural gas integral compressor engine

Multiple hydrogen/natural gas fuel blends were tested on a Cooper Bessemer GMV4-TF compressor engine aspiring for a reduction in residual methane emissions. Testing was carried out fueling both the main and pre-combustion chambers with the blends and fueling the pre-combustion chambers with the blends while the main chamber was fueled solely with natural gas.

Hydrogen fuel line design and build

A new fuel system was designed and built at Colorado State University so that the Cooper Bessemer GMV4-TF engine could safely blend natural gas and hydrogen together. The system incorporated Coriolis flow controllers and customized tubing and piping configurations.

Directional pre-combustion chamber design and testing

CFD simulations were used to locate pockets of unburned hydrocarbons within the main combustion chamber. These proposed locations were then used to design multiple pre-combustion chamber nozzle configurations that were simulated again. The best performing design was manufactured and tested on a Cooper Bessemer GMV4-TF compressor engine.

Premixed fuel injection of an active pre-combustion chamber

CFD simulations of premixed fuel and air injected into a pre-combustion chamber were performed aiming for a less stratified mixture.

TECHNICAL SKILLS

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| • Python programming | • Combustion analysis |
| • Computational fluid dynamics | • Engine performance testing |
| • Finite element analysis | • Fluid mechanics |
| • CAD modeling | • Heat transfer |
| • MATLAB | • Thermodynamics |
| • Reaction kinetics | • High performance computing |
| • Experimental design and analysis | • Turbulence modeling |
| • Numerical methods | |
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JOURNALS AND CONFERENCE PROCEEDINGS

Vieira G, Lorenzen R, Patterson M and Olsen D (2024), "Methane Emission Reduction Through Hydrogen Blending in a Large Bore 2-Stroke Lean-Burn Natural Gas Compressor Engine". Front. Fuels. 2:1404367. doi: 10.3389/ffuel.2024.1404367

Greg Vieira, Nick Katsampes, Daniel Olsen, "Impact of Hydrogen Fuel Blending on Natural Gas Compression Engines", Gas Machinery Conference 2023, Phoenix, Arizona October 3, 2023 (short course)

Greg Vieira, Kyle Beurlot, Nelson Xie, Mark Patterson, Daniel Olsen, "Pre-Combustion Chamber Nozzle Design Effect on Unburned Methane Emissions of a Large Bore Two-Stroke Lean- Burn Natural Gas Engine," 13th U.S National Combustion Meeting, Combustion Institute, College Station, Texas March 19-22, 2023

Kyle Beurlot, Dr. Timothy J. Jacobs, **Greg Vieira**, Dr. Daniel Olsen, Dr. Mark Patterson, "Practical Pre-Ignition Introduction of Radical Species Using a Radical-Generating Pre-combustion Chamber for Main Chamber Seeding", 13th U.S National Combustion Meeting, Combustion Institute, College Station, Texas March 19-22, 2023.

REFERENCES

Available upon request
