

Kevin Hoopes

Work Experience

Engineer/Research Engineer, Southwest Research Institute, 5/2013 - Present

Project Management

- Managed US Department of Energy project (\$650k, an additional engineer at SwRI and outside partner) to develop and optimize an sCO₂ bottoming cycle for small scale gas turbines. This project included extensive multi-objective thermodynamic cycle optimization.
- Managed US Department of Energy project (\$300k, 4 additional engineers at SwRI) to develop a novel heat exchanger geometry for a high temperature sCO₂ recuperator using additive manufacturing.
- Managed project (\$100k) to develop novel centrifugal compressor range extension concepts. This project included extensive geometry generation, meshing, and simulation automation.

Analysis

- Developed a reduced order heat exchanger off-design performance method in MATLAB and Python that can predict off-design heat exchanger performance without detailed geometry.
- CFD analysis of front cover seal for centrifugal compressor including full 360 whirling, moving mesh, transient CFD to characterize rotordynamic performance of the seal and front cavity.
- CFD calculation of aerodynamic damping and transient pressures for a covered centrifugal compressor for use in a forced response FEA analysis.

Design

- Complete clean sheet design of an sCO₂ radial inflow turbine including optimization of 1D sizing and detailed 3D aerodynamic design of turbine blading along with extensive conjugate heat transfer analysis of turbine and surrounding components to ensure thermal sealing.
- Complete clean sheet design of a centrifugal air compressor to act as an air dynamometer for an sCO₂ turbine test.

Lab Testing

- Developed a python based data acquisition and control system from scratch complete with a GUI for testing with live plotting, data logging, and unattended operation of a reciprocating compressor.
- Designed and executed all aspects of an experimental test campaign to measure inlet flow distortion and its effect on the performance of a centrifugal compressor.

More projects and publications listed on kevinhoopes.com

Graduate Research Assistant, Virginia Tech - Dr. Walter O'Brien, 8/2011-5/2013

- Developed novel method to generate arbitrary swirl patterns for jet engine inlet distortion research.
- Designed and implemented an instrumentation and testing environment, using LabView, for small scale swirl screen experiments prior to full scale jet engine tests.

Education

MS Mechanical Engineering, Virginia Tech, May 2013

- Thesis Topic: *A new method for generating swirl inlet distortion for jet engine research*

BS Mechanical Engineering, Brigham Young University, August 2011

- 3.7/4.0 GPA, Mathematics Minor

Skills & Interests

Skills:

- Python, MATLAB, CFX, Pointwise, ICEM, FLUENT, LabView, ANSYS, SolidWorks, Unigraphics
- CFD, Multi-objective optimization, fluid-thermal flow networks, cycle modeling, instrumentation
- Able to quickly learn new computer languages, systems, and complex applications
- 20 years of experience using Linux and Unix in a desktop and high performance computing environment

Interests:

- Being outdoors: hiking, backpacking, camping, mountain biking, 4x4 exploring etc.
- Photography of people, places, and wildflowers. Spending time with my four young children

Foreign Language:

- Able to read, write, and speak Spanish (19 credit hours of Spanish at BYU)