Andre Gouws

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Charlotte, NC
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Education

MS | Mechanical Engineering
UT Austin | Spring 2020
- Research: Selective laser flash sintering (SLFS) of ceramics
- Advisor: Dr. Desiderio Kovar
- GPA: 3.8

BS | Mechanical Engineering
NC State University | Spring 2018
- Minor in Physics
- Graduated *magna cum laude*
- GPA: 3.62

Technical Skills

Programming Languages
Python • C++• Matlab

Software
LaTeX • LabVIEW • SIERRA/Cubit • Simulink • Solidworks • Coreform IGA/Flex

General
Machine Learning • Finite Element Modeling• Data Analysis • UNIX Systems • CAD Modeling

Academic Projects

Composites Failure Modeling
Developed software to predict multi-lamina failure of composites under varied loading and material conditions

Drone Controller
Designed control system for quadcopter with disturbance rejection, w/ frequency response & root locus methods

Nuclear Reactor Probe
Light-detecting probe to determine power output of PULSTAR reactor by measuring cherenkov radiation output

Consumer Bike Products
Consumer facing design project to construct and test a spooled bike cable lock and U-bolt holder

Laminar Water Turret
Senior design project to modify existing laminar water jet from PENTAIR to allow for 90 degrees of controlled rotation

Experience

Coreform LLC — **Charlotte, NC (Remote)**
Isogeometric Analysis & Software Development — Summer 2020 - Present
- Studied convergence of various boundary value problems using Isogeometric Analysis (IGA) and compared to conventional FEA methods
- Using advanced meshing tools to create unstructured spline representations of geometrically-compliant lattice structures
- Created exhaustive unit tests for evaluating effectiveness of spline translation from CAD geometry within AGILE software development cycle

Advanced Materials Group — **The University of Texas at Austin**
Additive Manufacturing & Thermal Modeling — Spring 2019 – Spring 2020
- Conducted selective laser flash sintering (SLFS) of aluminum nitride ceramics
- Created analytical models in MATLAB and numerical models in COMSOL Multiphysics to predict thermal behavior of ceramics during Selective Laser Flash Sintering (SLFS) process

Los Alamos National Laboratory — **Los Alamos, NM**
Materials Characterization — Summer 2019
- Used electron microscopy techniques to characterize microstructure of ceramics in response to varying electrical and heating regimes

Oak Ridge National Laboratory — **Oak Ridge, TN**
Machine Learning — Summer 2018
- Developed machine learning tools to characterize properties of thin films

Sandia National Laboratories — **Albuquerque, NM**
Device Development & Rapid Prototyping — Summer 2016 - Spring 2018
- Created, verified & validated finite element models of hermetic seals and embedded fiber sensors using Sandia SIERRA/Cubit analysis tools
- Developed fiber bragg sensor for predicting multiaxial strains while embedded in host materials & created mathematical model for embedded strain prediction utilizing numerical, analytical, and experimental methods
- Designed, prototyped and tested multi-material additively manufactured shock failsafe device to be deployed in high-consequence devices

Two Phase Flow Group — **NC State University**
Data Visualization & High Performance Computing — Fall 2016 – Spring 2018
- Developed interactive visualizations and data postprocessing tools to diagnose bugs and identify malformed flow patterns in direct numerical flow simulations
- Optimized parallel processing regime to improve computational efficiency of high-performance multiphase flow simulations

Community

Graduate Teaching Assistant — Fall 2019 - Present
- Prepared lectures and projects for students to introduce them to engineering concepts such as energy, work, mechanics, and more
- Led seminar discussions to relate engineering concepts to student experiences

VP of NC State Astronomy Club — Spring 2015 - Spring 2017
- Renovated local observatory and restored a collection of damaged/inoperable telescopes to working conditions
- Hosted community events where students, children, and adults could learn about celestial phenomena