

CARSON HAACK

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EDUCATION

Bachelor of Science, Aerospace Engineering, May 2015

The University of Alabama: Tuscaloosa, AL

3.82 Overall GPA – Magna cum Laude

- President's List-Fall 2011, Spring 2012, Spring 2013 Dean's List-Fall 2012, Fall 2013
- Theta Tau Professional Co-Ed Engineering Fraternity – Chapter President and Pledge Instructor
- Mellophone player in the Million Dollar Band
- Key Coursework: Structural Dynamics, Helicopter Theory, Finite Element Methods

Master of Science Aerospace Engineering- projected May 2017

The University of Alabama: Tuscaloosa, AL

3.3 Overall GPA – 9 credits earned

- Key Coursework: Wing and Airfoil Theory, Engineering Optimization, Aircraft Systems, Theory of Elasticity

ACADEMIC AND PROFESSIONAL EXPERIENCE

Research Assistant, University of Alabama Department of Aerospace Engineering and Mechanics

March 2014-Present

“Developing a Damping Model using Fractional Calculus”

- Objective: Derive a mathematical model for evaluating structural and viscous damping forces using fractional order derivatives
- Produced an analytical solution to the single-degree-of-freedom equation of motion for an arbitrary order derivative
- New model is hypothesized to be more accurate than traditional model for a certain fractional order

“Optimization using Hypercomplex Variable Sensitivity”

- Objective: Combine gradient-based optimization techniques with complex variable sensitivity calculation, using hypercomplex variables for problems that involve multiple design variables
- Synthesized an algorithm that translates analytical functions into a hypercomplex form with an optimization code that uses the BFGS variable metric method
- Using hypercomplex sensitivity is predicted to decrease the number of iterations for convergence to an optimal solution, as well as reduce computation time and increase accuracy

Athletic Tutor, University of Alabama Bill Battle Academic Center for Athletic Student Services

January 2016-Present

- Tutored student-athletes in mathematics, science, and engineering courses
- Documented student progress and adapted strategies to maximize subject knowledge
- Devised imaginative ways to communicate and demonstrate difficult concepts

Camp Health Care Provider, YMCA Camp Thunderbird

May 2013-August 2013

- Responded promptly to emergency situations and administered medication and first aid to campers and staff
- Communicated regularly with parents and staff, and organized logistics and documentation pertaining to campers and staff

Mathematics and Science Tutor, Chesterfield Learning Center

May 2012-May 2014

- Tutored students for standardized testing and schoolwork, providing guidance and expertise in a wide range of math and science topics
- Planned curricula for long-term clients, developing lesson plans and tailoring material to each student's needs
- Demonstrated strong interpersonal and client-based skills by building rapport with students, parents, tutors, and managers

COMPUTER EXPERIENCE

- Microsoft Publisher, Word, PowerPoint, and Excel
- Programming and computing with Mathematica, MATLAB, and C++
- Solid modeling and analysis with SolidWorks and ABAQUS

CERTIFICATIONS AND SKILLS

- Fundamentals of Engineering – Other Disciplines Exam: passing score
- Japanese language – basic proficiency
- Strong skills in instruction and education, and demonstrated ability to translate technical information for lay audiences