Madalyn Mikkelsen

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I am a graduate student in aerospace engineering seeking a full time structural analysis position working with aerostructures and/or composites for August 2020.

Education

Texas A&M University, College Station, TX **Jan 2019 – Expected Aug 2020**
Master of Science in Aerospace Engineering, GPA 4.0
Thesis Topic – Applications of multiobjective topology optimization using genetic programming and L-system languages
Certificate in Data-Enabled Discovery and Design of Materials (D^3EM)
Advisor – Dr. Darren J. Hartl

Texas A&M University, College Station TX **Aug 2014 – Dec 2018**
Bachelor of Science in Aerospace Engineering, GPA 3.6

Technical Skills

- Structural Design and Optimization
- Machine Learning
- FEA (Abaqus/Ansys)
- Technical Writing
- Productivity Software (Word, Excel, Outlook, LaTeX, Gantt)
- Proficient: Python, MATLAB, VBA
- Familiar: BASH/CSH, R, Java, JavaScript, HTML

Personal Skills

- Comfortable in leadership roles
- Strong organizational skills
- Efficient time management
- Background in competitive public speaking
- Experience in team environments

Work Experience

Texas A&M – M2AESTRO Laboratory **Aug 2016 – Current**
Graduate Assistant Researcher *College Station, TX*
Producing research according to objective set by funding agency and advisor. Several ongoing projects are detailed in the engineering projects section. Also working as a teaching assistant in fall of 2019. Responsibilities include helping instructor prepare for class, leading review sessions, holding office hours, and grading assignments.

Air Force Research Labs – RXAS **Summer 2018**
Student Intern *Dayton, OH*
Integrated non-linear truss based solver with parameterized L-System topology generation algorithm for design of origami patterns to model kinetic objectives.

Air Force Research Labs – RXAS **Summer 2017**
Student Intern *Dayton, OH*
Modeled and optimized functionally graded materials using Python to script structural models in Abaqus.

Rolls Royce – Controls and Data Services (Digital) **Jan 2017 – Aug 2016**
Performance and Reliability Engineering Co-op *Houston, TX*
Worked on the predictive health monitoring team to run real time data analytics on large rotary equipment in the energy industry. Responsibilities included communicating with customers in weekly update meetings, implementing data analytics to predict equipment failure in the fleet, and managing the office wide innovation initiative.

Engineering Projects

Origami Design Discovery (MAESTRO) **May 2018 - Present**

Coupled non-linear truss based solver with parameterized L-System topology generation algorithm for design of origami patterns to model kinetic objectives. Used Matlab for modeling of the non-linear truss based solver, python for topology generation and optimization package, and high performance computer (csh/Linux) for parallelization of optimizations.

Mikkelsen M., Gillman A., Fuchi K., Bielefeldt B., Buskohl P., Hartl D., 'Discovering Optimal Origami Fold Patterns Using Graph-Based L-System Topology Optimization', paper presented at SMASIS 2019 Conference on Smart Materials, Adaptive Structures and Intelligent Systems, Louisville, Kentucky, 9-11 September.

Morphing Subsonic Airfoil (MAESTRO) **Jan 2019 – Present**

Developed a loosely coupled fluid-structures interaction model in Abaqus and XFOIL to model aerodynamic loading on the airfoil structure. Created a process to impose parameterized L-System generated topologies on a non-convex boundary. Managed a team of 3 to meet publication and course deadlines.

Mikkelsen et.al, 'Aerostructural optimization of a morphing airfoil using graph based L-System topologies', SMASIS 2019 Conference on Smart Materials, Adaptive Structures and Intelligent Systems, Louisville, Kentucky, 9-11 September.

Capstone Design Course **Jan 2018 – Dec 2018**

Lead a team of five to design and build a six-foot model plane over the course of a year. Managed meeting times, deliverables, and presentations. Acted as technical lead for weight and balance, manufacturing, and assisted with structural design.

Structural Optimization of a Wing **Aug 2018 – May 2018**

Coupled genetic optimization techniques with finite element stress analysis to optimize the structural layout of the airframe for a small electric aircraft. Received an award for highest grade in the class and was selected as a teaching assistant in fall of 2019.

Leadership and Extracurricular Activities

Sigma Gamma Tau, Tutoring Chair **Fall 2018 - Present**

Coordinated tutoring between members of SGT and underclassmen that need help in their aerospace coursework. Also trained members of SGT to mentor students effectively.

American Institute of Aeronautics and Astronautics, Member **Fall 2015 – Present**

American Society of Mechanical Engineers, Member **Spring 2019 – Present**

Relevant Coursework

MSEN 660 – Materials Informatics (Machine Learning)
MEEN 683 – Multidisciplinary Systems Design and Optimization
MEMA 613 – Principles of Composite Materials
MGMT 637 – Fundamentals of Entrepreneurship
AERO 489 – Composite Materials Research
AERO 405 – Aerospace Structural Design
AERO 430 – Numerical Simulation
D3EM Writing Workshop – Technical Writing