Daniel L. Dotson

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US Citizen ♦ Clearance Status: **Secret**

Objective

Seeking a **full-time** position as an aerospace engineer. Particular areas of interest include **Computational Aerodynamics, Flight Dynamics and Controls, Structural Mechanics, and Jet Propulsion.**

Experience

Vertex Aerospace TCS (Formerly L3 TCS) - Mechanical Engineer *October 2018-Present*

- Designed mounts, racks, panels, and enclosures for integrating both internal and external systems on a variety of airframes.
- Performed detailed site surveys of aircraft, gathering relevant data, planning designs, and modeling existing structure.
- Produced detailed 3D models of designs and their interface with existing structure.
- Produced detailed manufacturing, modification, and installation drawings.
- Considered a large parameter space for each design, working within a multidisciplinary team to optimize for both cost and performance throughout the program lifecycle.
- Provided engineering support for install teams.
- Employed reverse engineering principles for several designs, including an unconventional gearbox.
- Updated fastener model library to improve consistency and quality, using modern configuration features in SolidWorks.
- Assisted in the development of engineering training and reference material.

Education

Georgia Institute of Technology, Atlanta, Georgia **Graduated Fall 2017**

- Bachelor of Science in Aerospace Engineering **GPA: 3.01**
- Dean's List (Fall 2014)

Independent Research Projects

Vortex Particle Code

A novel computational aerodynamics tool developed in MATLAB for evaluating unsteady aerodynamic loads on stalled wings and blunt bodies in low-speed flow.

- Solves the vorticity equation directly, with no need for a turbulence model to close the system.
- Satisfies impermeability and no-slip boundary conditions using a high-order Boundary Element Method.
- Fully accounts for viscous vorticity diffusion using a random-walk algorithm.
- Uses the Fast Multipole Method algorithm on an adaptive quadtree data structure to accelerate computation by several orders of magnitude.
- Has been validated at a wide range of Reynolds numbers using the canonical flow around a circular cylinder.

3D Unsteady Panel Code

A computational aerodynamics tool developed in MATLAB for evaluating aerodynamic loads on 3D bodies in low-speed flow.

- Uses uniform triangular doublet elements and uniform triangular source elements to enforce boundary conditions.
- Accurately represents wake as force-free using an unsteady wake advection scheme.
- Resolves structures in the wake such as the starting vortex and tip vortex roll-up, which have a time-dependent influence on the pressure distribution.

Shock-Expansion Analysis Code with Wave Interactions

A novel computational aerodynamics tool developed in MATLAB for evaluating aerothermodynamic loads on bodies in supersonic flow.

- Extends the applicable range of Shock-Expansion Theory by accounting for wave interactions.
- Expansion wave interactions solved using Method of Characteristics. All other interactions solved using pressure matching across slip-surfaces.
- Predicts curvature, reflection, and far-field attenuation of shockwaves.
- Notable runs include an underexpanded linear aerospike in flight, a supersonic blade cascade, and an unpowered scramjet.

Software

Matlab, Simulink, SolidWorks, AutoCAD, Femap, Autodesk Nastran, Ansys Fluent, Pointwise, OpenVSP, Xfoil, XFLR5, Inventor, Fusion 360, Microsoft Excel, Microsoft Word