Resume | D. Stuart Bowman

Contact:

- gmail: bowman.d.stuart

- slack

- github

- linkedin

Technology keywords:

- SOLID software development

- C++, JAVA, Python3

- MacOs, Linux (Rocky, Raspberry Pi OS)

- Aviation, Avionics, Flight Management System, Guidance, Navigation, Control, Robotics, Algorithms

I am:

- a member of the technical staff at the MITRE Corporation;
- an aerospace engineer who loves writing scientific software for the aviation research community;
- a research software engineer;
- a developer of algorithms;
- a researcher and modeler of Flight Management Systems;
- a developer of scientific simulations;
- a data analyst.

I'm always interested in opportunities that:

- deepen my simulation expertise;
- deepen my scientific expertise;
- broadens my ability to talk about science and aviation;
- uses scientific software thoughtfully for good science & reproducibility;
- pays attention to Open Science and open source software concepts.

Research Engineer @ MITRE

My background is in the science of flight and software engineering & that has been the main focus of my work at MITRE: commercial aviation simulations. The essential work of my career has been to practice two deeply technical fields and bring them together: aerospace engineering and software engineering. I do this by building scientific simulations that enable scientifically defensible & reproducible research.

Publications

I enjoy writing about science; I mostly do it using computer languages.

Open Source

- FIM MOPS Aircraft & Control Model: A basic civil aviation simulation that contains standard 3-DOF equations of motion, and basic control laws for a guidance path. This code is used by avionics manufacturers when testing for compliance to RTCA minimum operational standard [DO-361A](DO-361A) and documented in this MITRE technical paper.

- [Interval Management Sample Algorithm](): A minimum "sample" implementation of the algorithms necessary to comply with [DO-361A](). This is used as a reference by manufacturers seeking to implement Interval Management concepts in the Flight-deck.

Conference, etc.

- *Analysis of the Use of Estimated Time of Arrival boradcast for Interval Management.* Air Traffic Management, 2017.
- *Closing the Loop: Testing for IM Avionics Certification.* AIAA SciTech, 2016.
- *[Minimum Drag Power-Law Shapes for Rarefied Flow]()*
- *[Optimization of Low-Perigee Spacecraft Aerodynamics]()*
- Thesis: *Numerical Optimization of Low-Perigee Spacecraft Shapes*, University of Maryland at College Park, May 2001.

Extracirricular

- Robotics Instructor @ [Cornerstone Classical Academy]() in Roanoke, VA since 2020.
- You can find out more about me at my blog: [aerosci.dev]().

Previous Employment

8/2004- 2/2008 | Systems Engineer | [SAIC, Inc.](), Crystal City, VA

- Regularly perform maintenance and accreditation of physics-based, 6-DoF simulations of the Tomahawk cruise missile as an integral member of the Mission Validation Analysis team.
- Research performance concerns and prototype solutions, providing valuable support to the simulation development effort.
- Develop software tools which increase the productivity of the team, including network resource management software and IDE-style scripting software.

7/2003 − 8/2004 | Systems Engineer | [SPARTA, Inc.](), Rosslyn, VA

- Interacted with the Missile Defense National Team, producing documents and presentations which advised the government regarding existing and developing ballistic missile threats around the world.

7/2001 − 7/2003 | Engineer | Systems Engineering Group, Inc., Columbia, MD

- Employed knowledge of aerodynamics, propulsion, and flight dynamics in the development of classified and unclassified missile models, and used those models to generate reliable data for our Naval customer.
- Maintained and streamlined a six degree-of-freedom point-mass simulation code, providing valuable support and increased functionality for the users.
- Conducted research in areas key to the missile modeling process and produced memorandums which accurately summarized the results.

6/1999 - 6/2001 | Graduate Research Assistant | University of Maryland College Park ~ Center for Hypersonic Education and Research, College Park, MD

- Developed and designed a low-perigee spacecraft geometry model and an analytical, rarefied flow model resulting in software which calculated a spacecraft's on- and off-design forces and moments.

- Integrated the geometry and aerodynamic flow models with a numerical, gradient-based optimizer and successfully explored the spacecraft's design space, producing a reduced drag spacecraft shape for NASA Goddard's Geospace Electrodynamics Connections mission.

Education

Master of Science | 2001 | University Of Maryland College Park

Concentration: Aerospace Engineering

Thesis: Numerical Optimization of Low-Perigee Spacecraft Shapes

Key Courses: Astrodynamics, High-Temperature Gas Dynamics, Viscous Flow, High-Speed Propulsion, Burning Theory, Computational Fluid Dynamics, Engineering Optimization, Electric Propulsion

Bachelor of Science | 1999 | Magna Cum Laude (3.86/4.0) | University of Maryland College Park

Concentration: Aerospace Engineering

Key Courses: Aerodynamics (Hypersonic, Compressible, Incompressible), Air-breathing Propulsion, Aircraft Performance and Control, Aircraft Design, Aircraft Structures, Technical Writing