

Isaac J. Tetzloff

Curriculum Vitae

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Research Interests

Aircraft Design, Aircraft Allocation, Environmental Impact of Aviation, Decomposition Approaches for Allocation, Multidisciplinary Design Optimization and Operations Research.

Education

Purdue University – West Lafayette, IN

2010 to Present **Doctor of Philosophy, Aeronautics and Astronautics.**

- Research Topic: Decomposition of Large Aircraft Allocation Problems
- Advisor: Professor William A. Crossley
- Major Area of Study: Aerospace Systems
- Minor Area of Study: Dynamics and Control
- Cumulative GPA: 3.99 / 4.00

2010 to Present **Master of Science, Industrial Engineering.**

- Non-Thesis Option
- Major Area of Study: Operations Research
- Cumulative GPA: 4.00 / 4.00

2007 to 2010 **Master of Science, Aeronautics and Astronautics.**

- Thesis: *An Allocation Approach to Investigate New Aircraft Concepts and Technologies on Fleet-Level Metrics*
- Advisor: Professor William A. Crossley
- Major Area of Study: Aerospace Systems
- Minor Area of Study: Dynamics and Control
- Cumulative GPA: 4.00 / 4.00

Massachusetts Institute of Technology – Cambridge, MA

2003 to 2007 **Bachelor of Science, Aerospace Engineering with Information Technology.**

- Minor in Spanish
- Cumulative GPA: 4.3 / 5.0

2003 to 2007 **Bachelor of Science, Management Science.**

- Concentration in Finance
- Cumulative GPA: 4.5 / 5.0

Work Experience

Research and Educational

2007 to Present **Graduate Research Assistant, Purdue University, West Lafayette, IN.**

Developed Fleet Level Environment Evaluation Tool (FLEET) to assess the impact of fleet-level emissions and noise restrictions on US domestic flights through an integer-programming allocation problem focusing on 257 of the busiest airports in the United States. Currently working on expanding FLEET to handle more international flights, more aircraft, various agents/airlines and measuring new metrics dealing with passengers and airlines. PhD dissertation to explore possible decomposition of large allocation problem.

2008 to Present **Grader, Purdue University, West Lafayette, IN.**

Responsible for creating, solving and grading homework and assessment questions for AAE 550 Multidisciplinary Design Optimization, AAE 551 Design Theory and Methods for Aerospace Systems, and AAE 451 Aircraft Design.

Internships

- 2011 **Engineering Intern**, *Orbital Sciences Corporation*, Dulles, VA.
Performed systems engineering tasks on the Cygnus space vehicle as part of the COTS/CRS Program. Evaluated the testing procedures for Cygnus and helped to implement a stronger Test Like You Fly (TLYF) philosophy in the testing of Cygnus.
- 2006 and 2007 **Engineering Intern**, *Orbital Sciences Corporation*, Dulles, VA.
Principle developer for a software tool using Matlab and STK/Connect that would allow for rapid re-planning of a sequence of burns that will bring a spacecraft from a geosynchronous transfer orbit to a geostationary orbit. Worked to design used interfaced and implementing the targeting algorithms in Matlab and STK/Connect with Astrogator. Modeled multiple-flexible-body systems within Matlab and Simulink for use in future Orbital work and designs.
- 2004 and 2005 **Apprentice Software Engineer**, *Anzus, Inc.*, San Diego, CA.
Developed and tested newly implemented C++ code from original Matlab code used in the Anzus STONE client, which employs mathematical algorithms for image registration and pattern recognition. Statistically analyzed real-time data collected by the USS Normandy using Anzus software for accuracy, efficiency and reliability. Created code used in the preliminary models of the Anzus ROAG FPGA card using Xilinx VHDL tools.

Design & Group Project

- 2006 to 2007 **MoRETA Rover - Senior Capstone Design Project**, *MIT*, Cambridge, MA.
Senior design project spread over three semesters involving the conception, development and construction of a legged and wheeled rover for extreme terrain - MoRETA (Modular Rover for Extreme Terrain Access). Served as one of the lead systems engineers along with developing crucial parts of the operations software and autonomy algorithms

Publications

Conference Papers

- 2011 **Evaluating Market and Environmental Impacts of an N+3 Supersonic Aircraft**, *Isaac J. Tetzloff and William A. Crossley*.
49th AIAA Aerospace Sciences Meeting (ASM) including the New Horizons Forum and Aerospace Exposition, 4-7 January 2011, Orlando, FL. Published as AIAA 2011-463.
- 2010 **Impact of Future Generation Aircraft on Fleet-Level Environmental Emission Metrics**, *Isaac J. Tetzloff and William A. Crossley*.
10th AIAA Aviation Technology, Integration, and Operations (ATIO) Conference, 13-15 September 2010, Fort Worth, TX. Published as AIAA 2010-9205.
- Assessing New Aircraft and Technology Impacts on Fleet-Wide Environmental Metrics including Future Scenarios**, *Jia Zhao, Isaac J. Tetzloff et al.*
48th AIAA Aerospace Sciences Meeting (ASM) including the New Horizons Forum and Aerospace Exposition, 4-7 January 2010, Orlando, FL. Published as AIAA 2010-282.
- 2009 **An Allocation Approach to Investigate New Aircraft Concepts and Technologies on Fleet-Level Metrics**, *Isaac J. Tetzloff and William A. Crossley*.
9th AIAA Aviation Technology, Integration, and Operations (ATIO) Conference, 21-23 September 2009, Hilton Head, SC. Published as AIAA 2009-6979.

Technical Presentations

- 2011 **Exploring Different Problem Formulations to Evaluate Environmental Impacts of Aviation**, *Isaac J. Tetzloff and William A. Crossley*.
INFORMS Annual Meeting 2011, 13-16 November 2011, Charlotte, NC.
- Evaluating Market and Environmental Impacts of an N+3 Supersonic Aircraft**, *Isaac J. Tetzloff and William A. Crossley*.
3rd Computational Science and Engineering Student Conference (CSESC), 1 April 2011, West Lafayette, IN.
- Using Aircraft Allocation to Assess Environmental and Market Impacts of New Aircraft Concepts**, *Isaac J. Tetzloff and William A. Crossley*.
Purdue Graduate Student Recruitment Weekend Poster Session, 26 February 2011, West Lafayette, IN.

- Evaluating Market and Environmental Impacts of an N+3 Supersonic Aircraft**, *Isaac J. Tetzloff and William A. Crossley*.
2011 AAE Research Symposium Series, 24 February 2011, West Lafayette, IN.
- 2010 **Decomposition Approach for Aircraft Allocation Under Environmental Considerations**, *Isaac J. Tetzloff and William A. Crossley*.
INFORMS Annual Meeting 2010, 7-10 November 2010, Austin, TX.
- Impact of Future Generation Aircraft on Fleet-Level Environmental Emission Metrics**, *Isaac J. Tetzloff and William A. Crossley*.
7th Postgraduate Academic Forum of Beijing University of Aeronautics and Astronautics, 21 October 2010, Beijing, China.
- The Impact of New Aircraft and Technologies on Fleet-Level Metrics**, *Isaac J. Tetzloff*.
Purdue Aerospace Systems Day, 28 August 2010, West Lafayette, IN.
- Using Aircraft Allocation and Fleet-Level Metrics to Analyze NASA's Subsonic Fixed Wing Emission Goals**, *Isaac J. Tetzloff*.
NASA Langley Research Center (LaRC) Aeronautics Systems Analysis Branch (ASAB) Technical Forum, 19 July 2010, Hampton, VA.
- Using Aircraft Allocation and Fleet-Level Metrics to Analyze NASA's Subsonic Fixed Wing Emission Goals**, *Isaac J. Tetzloff and William A. Crossley*.
2nd Computational Science and Engineering Student Conference (CSESC), 1 April 2010, West Lafayette, IN.
- Using Aircraft Allocation and Fleet-Level Metrics to Analyze NASA's Subsonic Fixed Wing Emission Goals**, *Isaac J. Tetzloff and William A. Crossley*.
2010 AAE Research Symposium Series, 9 March 2010, West Lafayette, IN.
- Assessing Impacts on Airline Fleet Emissions and Direct Operating Costs through Aircraft Allocation**, *Isaac J. Tetzloff and William A. Crossley*.
Purdue Graduate Student Recruitment Weekend Poster Session, 27 February 2010, West Lafayette, IN.
- 2009 **Assessing Market and Environmental Impacts of an N+3 Supersonic Aircraft**, *Isaac J. Tetzloff, William A. Crossley and Muharrem Mane*.
INFORMS Annual Meeting 2009, 11-14 October 2009, San Diego, CA.
- Assessing Impacts on Airline Fleet Emissions and Direct Operating Costs through Aircraft Allocation**, *Isaac J. Tetzloff*.
Purdue Aerospace Systems Day, 22 August 2009, West Lafayette, IN.
- Assessing Impacts on Airline Fleet Emissions and Direct Operating Costs through Aircraft Allocation**, *Isaac J. Tetzloff and William A. Crossley*.
Purdue Graduate Student Recruitment Weekend Poster Session, 28 February 2009, West Lafayette, IN.
- 2008 **Assessing Impacts on Airline Fleet Emissions and Direct Operating Costs through Aircraft Allocation**, *Isaac J. Tetzloff and William A. Crossley*.
INFORMS Annual Meeting 2008, 12-15 October 2008, Washington, DC.

Theses

- Master's Thesis **An Allocation Approach to Investigate New Aircraft Concepts and Technologies on Fleet-Level Metrics**, *Isaac J. Tetzloff*.
Master's Thesis, Purdue University, May 2010.

Affiliations

- American Institute of Aeronautics and Astronautics**, *Student Member*.
Delta Tau Delta International Fraternity, *Initiated with Beta Nu Chapter at MIT*.
Institute for Operations Research and the Management Sciences, *Student Member*.
Order of Omega Greek Honor Society, *Initiated with MIT Chapter*.
Sigma Gamma Tau Aerospace Engineering Honor Society, *Initiated with Alpha Chapter at Purdue*.
Society for Industrial and Applied Mathematics, *Student Member*.
Tau Beta Pi Engineering Honor Society, *Initiated with Indiana-Alpha Chapter at Purdue*.

Leadership

- 2010 to Present **Aero Assist Graduate Student Organization**, *Treasurer.*
- 2007 to Present **MIT Educational Council**, *Educational Counselor.*
- 2008 to 2009 **Sigma Gamma Tau**, *Treasurer.*
- 2005 to 2006 **MIT Interfraternity Council (IFC)**, *President.*
- 2004 to 2005 **MIT Interfraternity Council (IFC)**, *Executive Assistant.*
- 2004 to 2007 **MIT Office of Undergraduate Advising and Academic Programming**, *Associate Advisor.*
- 2006 to 2007 **Delta Tau Delta Fraternity**, *Risk Manager.*
- 2004 to 2006 **Delta Tau Delta Fraternity**, *New Member Educator.*

Awards

- 2012 **Purdue Forever Fellowship.**
- 2009 to 2012 **NASA GSRP Fellowship Award**, *NASA Langley Research Center.*
- 2010 **School of Aeronautics and Astronautics Research Symposium Series**, *Best Abstract.*
- 2007 **MIT Stewart Award**, *Institute Award for Contributions to Student Life at MIT.*
- 2007 **MIT FSILG Senior Legacy Award**, *Student Life Award for Contributions to Greek Life at MIT.*

Skills

- Programming \LaTeX , \BIBTeX , Matlab, GAMS, Java, Fortran 90, AdA95, HTML, Limited C++ and Visual Basic.
- Computers Matlab, Simulink, STK, STK Connect, Mathcad, Microsoft Office, Microsoft Windows, Mac OS X.
- Language Fluent in Spanish.

Last Updated: February 6, 2012