

# Curriculum Vita

## Contact Information

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## Academic Experience

### Education

Doctor of Philosophy in Systems Engineering <b>Air Force Institute of Technology</b>	<i>November 2013</i>
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- Areas of Concentration: System Reliability, Statistics
- **Dissertation:** “Modeling Reliability Growth in Accelerated Stress Testing”

Masters of Science in Materials Science and Engineering <b>Air Force Institute of Technology</b>	<i>September 2006</i>
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- Areas of Concentration: Structural Composite Materials
- **Thesis:** “Modeling Fracture in Z-Pinned Composite Laminated using DYNA-3D”

Bachelors of Science in Aerospace Engineering <b>Auburn University</b>	<i>December 2000</i>
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### Air Force Institute of Technology Record

Assistant Professor <i>Department of Systems Engineering and Management</i>	September 2013
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Deputy Director <b>Statistical Test and Analysis Techniques Center of Excellence</b>	<i>September 2013</i>
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Co-Primary Investigator <b>Test Science Research Consortium</b>	<i>September 2013</i>
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Member - External Discovery Sub-Committee <b>AFIT Quality Initiative Program</b>	<i>June 2016</i>
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Grants, Contracts, and Special Projects

# Publications

## Referreed Publications

- R. M. Vandawaker, D. R. Jacques, **J. K. Freels** (2015) “*Impact of Prognostic Uncertainty in System Health Monitoring*” International Journal of Prognostics and Health Management: Vol 6 (Special Issue Uncertainty in PHM) 011
- **J. K. Freels**, J. J. Pignatiello, R. L. Warr, and R. R. Hill (2015) “*Bridging the Gap between Quantitative and Qualitative Accelerated Life Tests*” Quality and Reliability Engineering International, 31: 789–800. doi: 10.1002/qre.1636
- Collins D. H., **Freels J. K.**, Huzurbazar A. V., Warr R. L., and Weaver B. P. (2013) “*Accelerated Test Methods for Reliability Prediction*” Journal of Quality Technology, 45, No. 3, 244-259.
- Collins D. H., **Freels J. K.**, Huzurbazar A. V., Warr R. L., and Weaver B. P. (2012) “*Accelerated Test Methods for Reliability Prediction*” Los Alamos National Lab TSC Directorate Science Highlights, 134-135, LA-UR-12-20429.

## Preprints and Submitted Papers

- Vandawaker R. M., Jacques D. R., **Freels J. K.**, Ryan E., and Huscroft J. (2016) “*Health Monitoring Impact on Non-Repairable Component Supply Methods*” Journal of Quality in Maintenance Engineering
- **Freels J. K.**, Pignatiello J. J., Warr R. L., and Hill R. R. (2016) “*Maximum Likelihood Estimation for the Poly Weibull Distribution*” Quality Engineering
- **Freels J. K.**, Pignatiello J. J., Warr R. L., and Hill R. R. (2016) “*Simplified Modeling of the N-Fold Weibull Distribution*” Quality and Reliability Engineering International

## Works In-Preparation (anticipated completion date)

### Referreed Journal Articles

- Deering P. R., **Freels J. K.**, and Valencia V. V. (2017) *Modeling Air Force civil infrastructure: A comparison of stochastic process models* ASCE-ASME Journal of Risk and Uncertainty in Engineering Systems, Part A: Civil Engineering.
- **Freels J. K.**, Meeker W. Q., and Escobar L. A. (2017) *SMRD: Statistical methods to accompany the text Statistical Methods For Reliability Data* The R Journal
- **Freels J. K.**, Meeker W. Q., and Escobar L. A. (2017) *SMRD: Comprehensive life-data analysis in R* Journal of Statistical Software
- **Freels J. K.** and Boehmke B. R. (2017) *teachingApps: A new package for building, and sharing shiny apps* The R Journal.
- **Freels J. K.** and Boehmke B. R. (2017) *teachingApps: Easy A how-to manual for building, and sharing Shiny apps* The Journal of Statistics Education.
- **Freels J. K.** and Boehmke B. R. (2017) *AFIT: A R package of document templates for theses, dissertations, and journal articles* The R Journal.
- **Freels J. K.** and Boehmke B. R. (2017) *learningCurve: A R package of example code for building over 100 shiny apps* The R Journal.
- **Freels J. K.** and Boehmke B. R. (2017) *evmR: A R package of example code for building over 100 shiny apps* The R Journal.

- **Freels J. K.** and Boehmke B. R. (2017) *publicLibs: A R package to find and manipulate data about U. S. Public Libraries* The R Journal.

#### Books and Book Chapters

- Meeker W. Q., Escobar L. A. and **Freels J. K.** (2018) *Statistical Methods for Reliability Data, 2nd ed.* John Wiley and Sons, Inc.

#### Published Software

- **Freels J. K.**, Meeker W. Q., and Escobar L. A. (2017) *SMRD: Comprehensive analysis of reliability and survivability data* R package version 0.10.0.
- **Freels J. K.** and Boehmke B. R. (2017) *teachingApps: Example apps for teaching statistics, R programming, and shiny development* R package version 1.0.0.
- **Freels J. K.** and Boehmke B. R. (2017) *AFIT: Templates for AFIT theses, dissertations and various journal articles* R package version 1.0.0.
- **Freels J. K.**, DeGroot C., and Schultz D. (2017) *PublicLibs: Functions for manipulating and visualizing U. S. Public Library data* R package version 1.0.0.
- **Freels J. K.** and Boehmke B. R. (2017) *learningCurve: Templates for AFIT theses, dissertations and various journal articles* R package version 1.0.0.
- **Freels J. K.** and Boehmke B. R. (2017) *evmR: A package of templates for AFIT theses and dissertations and various journal articles* R package version 1.0.0.

## Proceedings and Presentations

### Conference Proceedings

- Holm, E.S., Valencia, V.V., Thal, A.E., **Freels, J.K.**, Badiru, A.B. (2016) *Materials Testing and Cost Modeling for Composite Parts through Additive Manufacturing* Paper presented at the 13th Annual Acquisition Research Symposium, Monterrey, CA, May 2 – 4.
- Kilic H., Soni S. R., Patel R., and **Freels J. K.** (2007) *Effect of Z-Fiber Percentage on the Fracture Behavior of DCB Specimens in Mode I* The 14th International Conference on Computational & Experimental Engineering and Sciences, Miami, FL, USA.

## Awards and Honors

- 2013 Nelson Award - American Society for Quality (Awarded annually the best technical paper for the application of reliability)
- Lead engineer for Aeronautical System Center 2009 Team of the Year (Finalist)
- \$10,000 IDEA Award for innovative repair design for F-16 belly door
- Lead engineer for AFMC's Supply Chain Management Team of the Year (2002)

## Professional Associations and Certifications

- Member: American Society for Quality
- Member IEEE Reliability Society

## Other Experience

### United States Air Force

F-16 Lead Structural Engineer

*2001 - 2004*

**Ogden Air Logistics Center - Hill AFB, UT**

- Lead depot engineer supporting over 100 critical items used on 3,900 F-16's at 88 bases worldwide
- Responsible for the design and implementation of modifications and repair procedures to reduce maintenance costs, eliminate mission delays and enhance the performance capabilities of the F-16
- Lead F-16 engineer for Aircraft Battle Damage Repair (ABDR) mission; coordinates training activities, mentors trainees and evaluates battle damage repair procedures in ABDR exercises
- Personally designed depot repairs resulted in over 100 F-16 wings and major wing structures returned to service-saved more than \$8M

Non-Destructive Evaluation Program Manager

*2006 - 2007*

**Air Force Research Laboratory - Wright-Patterson AFB, OH**

- Directs R & D efforts and facilitates transition of novel non-destructive evaluation (NDE) technologies and techniques
- Develops broad research plan for inspection and characterization of new aircraft materials
- Lead engineer for three separate twelve-member teams charged with solving fleet-wide critical fracture issues at fuselage-wing attachment points for C-5, A-10, and KC-135 aircraft
- Initiated \$1.5M KC-135 research program to baseline fleet fatigue damage. Results of teardown evaluation enabled a five-year fleet life extension and \$2M annual savings in maintenance costs

Military Assistant to the Director

*2007 - 2008*

**Air Force Research Laboratory - Wright-Patterson AFB, OH**

- Oversees diverse processes for 1,200-person, \$500M laboratory facilities to include four GSU's
- Prepares/directs briefings, visits, and lab tours for senior-level DOD, industry and foreign dignitaries
- Directed 1st AFRL Wargame Roadshow - Prioritized 150 research programs and \$225M Science and technology budget for OSD Title 10 Wargame

Lead Materials Engineer

*2008 - 2010*

**Aeronautical Systems Center - Wright-Patterson AFB, OH**

- Wing lead for modernization and technology transition efforts on over 500 mobility aircraft
- Provides expertise on sustainment requirements for over \$44.5B in support systems acquisitions
- Lead materials engineer in Bagram AB C-17 crash recovery effort, efforts led to the successful completion of aircraft ferry flight to depot 74 days early - saved \$220M jet from scrapping
- Led C-17 man-portable air defense system (MANPAD) survivability test program to reduce engine infrared signature by 75%. Test results enabled a 42% increase in counter-measure effectiveness
- Led PACAF engine corrosion field evaluation. Tested and qualified novel engine inlet coating material, resulted in the elimination a 168-hour overhaul

## Professional Development

- Air Command and Staff College, Air University, Maxwell AFB, AL
- Squadron Officer School, Air University, Maxwell AFB, AL
- Aerospace Basic Course, Air University, Maxwell AFB, AL
- Aircraft Battle Damage Repair, Technician Course, 649 CLSS, Hill AFB, UT
- Aircraft Battle Damage Repair, Assessor Course, 649 CLSS, Hill AFB, UT
- Aircraft Battle Damage Repair, Engineer Course, 649 CLSS, Hill AFB, UT
- Advanced Composites Engineering Course, USAF Advanced Composites Office, UT
- Air Force Materiel Command - Supply Chain Management Course, Air University, AL

- DAWIA Certifications - SPRDE (Level III); Program Management (Level II); Test and Evaluation (Level I)