Curriculum Vitae - Major Jason K. Freels, PhD.

CONTACT INFORMATION

Maj Jason K Freels
Air Force Institute of Technology
Dept. of Systems Engineering and Management
2950 Hobson Way, Bldg. 640, Rm. 103
WPAFB, OH 45433-7765

comm: 937.255.3636 ext. 4676
DSN: 785.3636
cell: 937.430.6619
email: **jason.freels@afit.edu**
url: **https://auburngrads.github.io**

EDUCATION

Doctor of Philosophy in Systems Engineering *November 2013*
Air Force Institute of Technology

- Areas of Concentration: System Reliability, Statistics
- **Dissertation:** "Modeling Reliability Growth in Accelerated Stress Testing"

Masters of Science in Materials Science and Engineering *September 2006*
Air Force Institute of Technology

- Areas of Concentration: Structural Composite Materials
- **Thesis:** "Modeling Fracture in Z-Pinned Composite Laminated using DYNA-3D"

Bacherlors of Science in Aerospace Engineering *December 2000*
Auburn University

ACADEMIC EXPERIENCE

Assistant Professor September 2013
Department of Systems Engineering and Management

Deputy Director *September 2013*
Statistical Test and Analysis Techniques Center of Excellence

Deputy Director *September 2013*
Test Science Research Consortium

Co-Founder *December 2016*
AFIT Data Science Lab

Committee Champion *January 2017*
Higher Learning Commission Assurance Argument

Member - External Discovery Sub-Committee *June 2016*
AFIT Quality Initiative Program

PUBLICATIONS

Referreed Software in Publication

- Boehmke B. C. and **Freels J. K.** (2016)
  learningCurve: An Implementation of Crawford's and Wright's Learning Curve Production Functions
  Comprehensive R Archive Network; Package version 1.0.0.

- Boehmke B. C., Montgomery R. T., Ogden J. A., and **Freels J. K.** [(2016)
  kraljicMatrix: A Quantified Implementation of the Kraljic Matrix
  Comprehensive R Archive Network; Package version 1.0.0.

Referreed Articles in Publication

- Boehmke B. C. and **Freels J. K.** (2016)
  learningCurve: An Implementation of Crawford's and Wright's Learning Curve Production Functions
  Journal of Open Source Software, DOI: http://dx.doi.org/10.21105/joss.00202.

- 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

- Boehmke B. C., Montgomery R. T., Ogden J. A., and **Freels J. K.** (2016)
  kraljicMatrix: An R package for implementing the Kraljic Matrix to strategically analyze a firm's purchasing portfolio
  Journal of Open Source Software, DOI: http://dx.doi.org/10.21105/joss.00170.

- 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; Impact Factor: 0.28

- **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; Impact Factor: 1.457

- 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.; Impact Factor: 1.152
  Lloyd S. Nelson Award - Paper with the greatest immediate impact to practitioners

- 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 & Submitted Works Under Review

- **Freels J. K.** DeGroot C., and Schultz D, Buyer J. Twigg C., and Daniels J. (2016)
  AFIT: RMarkdown templates for theses, dissertations, reports, and journal articles
  Comprehensive R Archive Network; Package version 1.0.0.

- **Freels J. K.**, DeGroot C. (2016)
  PublicLibs: Retreive, Manipulate and Visualize U. S. Public Library Data
  Comprehensive R Archive Network; Package version 1.0.0.
- **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
- Boehmke B. C. and **Freels J. K.**(2016)
  learningCurve: Implementing Crawford's and Wright's Learning Curve Production Functions in R
  Journal of Cost Analysis and Parametrics.

Works In-Preparation (anticipated completion)

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: App templates for teaching statistics and R programming
  The R Journal.
- **Freels J. K.** and Boehmke B. R. (2017)
  teachingApps: Templates for building over 150 interactive shiny apps in R
  The Journal of Statitics Education.
- **Freels J. K.** DeGroot C., and Schultz D., Buyer J., Twigg C., and Daniels J. (2017)
  AFIT: RMarkdown document templates for theses, dissertaions, reports, and journal articles
  The R Journal.
- **Freels J. K.** and Boehmke B. R. (2017)
  evmR: Project management in R using earned value management analysis
  The R Journal.
- **Freels J. K.** DeGroot C. (2017)
  publicLibs: Retreive, manipulate, and visualize U. S. Public Library data
  The R Journal.

Books and Book Chapters

- **Freels J. K.**, Meeker W. Q., and Escobar L. A. (2018)
  Statistical Methods for Reliability Data: Comprehensive life-data analysis in R
  John Wiley and Sons, Inc.

Refereed 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: Apps templates for teaching statistics, R programming, and shiny development
  R package version 1.0.0.
- **Freels J. K.** and Boehmke B. R. (2017)
  evmR: Project analysis using earned value management
  R package version 1.0.0.

CONFERENCE PROCEEDINGS & INVITED TALKS

- **Freels, J. K.** and Meeker, W. Q. (2017)
  Progress Update on R package SMRD
  Quality and Productivity Research Conference - Storrs, CT
- Bentz, B. R., Colombi, J. M. and **Freels, J. K.** (2017)
  Attritable Design Trades: Reliability and Cost Implications for Unmanned Aircraft
  Annual IEEE International Systems Conference - Montreal
- **Freels, J. K.** and Meeker, W. Q. (2017)
  Progress Update on R package SMRD
  Institute for Defense Analyses Test Science Workshop - Springfield, VA
- Mayo, B. R., Ahner, D. A. and **Freels, J. K.** (2015)
  Suitability Analysis of Continuous-Use Reliability Growth Projection Models
  Military Operations Research Society Symposium
  Richard H. Barchi Prize award winner for best presented paper
- 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
  13th Annual Acquisition Research Symposium - Monterrey, CA
- 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

AWARDS AND HONORS

- 2016 Richard H. Barchi Prize - Military Operations Research Society
  (Awarded to recognize the best paper given at the MORS Symposium)
- 2013 Lloyd S. Nelson Award - American Society for Quality
  (Awarded to recognize the technical paper providing the greatest immediate impact to practitioners)
- 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; Statistics Division
- Member: IEEE Reliability Society
- 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)

GRANTS, CONTRACTS, AND FUNDED PROJECTS

Project Title	Investigators	Role	Research Credit	Sponsor	Funded Amount	Dates of Funding
Science of Test	Ray Hill Maj Brian Stone Doug Hodson Maj Jason Freels	Co-PI Co-PI Co-PI Co-PI	25% 25% 25% 25%	DASD	$359,600	FY 2014
Civil Engineering Applications for Direct Digital Manufacturing	Maj Vhance Valencia Lt Col Kyle Oyama Maj Jason Freels	PI Co-PI Co-PI	50% 25% 25%	AFCEC	$78,305	FY 2015
Science of Test	Ray Hill Maj Brian Stone Doug Hodson Maj Jason Freels	Co-PI Co-PI Co-PI Co-PI	25% 25% 25% 25%	DASD	$755,160	FY 2015
Civil Engineering Applications for Direct Digital Manufacturing	Maj Vhance Valencia Lt Col Kyle Oyama Maj Jason Freels	PI Co-PI Co-PI	50% 25% 25%	AFCEC	$220,515	FY 2016
Science of Test	Ray Hill Maj Brian Stone Doug Hodson Maj Jason Freels	Co-PI Co-PI Co-PI Co-PI	25% 25% 25% 25%	DASD	$765,000	FY 2016
AFIT Data Science Lab	LTC Chris Smith Ken Bauer Brad Boehmke Maj Jason Freels	Co-PI Co-PI Co-PI Co-PI	25% 25% 25% 25%	Army Cyber	$250,000	FY 2017

STUDENTS ADVISED

Student Name	Rank	Degree	Program	Graduation	Faculty Role
Brent Russell	Civilian	MS	GSE	Jun 2014	Thesis Co-Advisor
Caleb Murphy	Capt.	MS	GSE	Jun 2014	Thesis Co-Advisor
AJ Berger	Capt.	MS	GSE	Jun 2014	Thesis Co-Advisor
Daniel Gartland	Capt.	MS	GEM	Mar 2015	Committee Member
Ben Mayo	1 Lt.	MS	GOR	Mar 2015	Thesis Co-Advisor
Gerald Jones	Civilian	MS	GSE	Jun 2015	Thesis Advisor
Shuxian Li	Civilian	MS	GSE	Jun 2015	Thesis Advisor
Charles Lopez	Civilian	MS	GSE	Jun 2015	Thesis Advisor
Robert Vandawaker	Lt. Col.	PhD	GSE	Sep 2015	Committee Member
Ricky Armwood	Civilian	MS	GSE	Dec 2015	Thesis Advisor
Patrick Deering	Capt.	MS	GEM	Mar 2016	Thesis Co-Advisor
Ryan Amedee	1 Lt.	MS	GEM	Mar 2016	Committee Member
Eric Holm	1 Lt.	MS	GEM	Mar 2016	Committee Member
John Gutierrez	1 Lt.	MS	GOS	Mar 2017	Committee Member
Brian Bentz	Capt.	MS	GSE	Mar 2017	Committee Member
Joseph Buyer	Capt.	MS	GEM	Mar 2017	Committee Member
Sean Murphy	Capt.	MS	GEM	Mar 2017	Committee Member
Corey Degroot	1 Lt.	MS	GEM	Mar 2017	Thesis Advisor
Nathan Greiner	Capt.	MS	GEM	Mar 2017	Thesis Advisor
Diane Schultz	Civilian	MS	GCA	Mar 2017	Thesis Advisor
Abdulrahmen Alwabel	RSAF	MS	GSE	Jun 2017	Thesis Advisor
Zachary Little	Civilian	PhD	GOS	Sep 2017	Committee Member
Daniel Timme	1 Lt.	MS	GSE	Mar 2018	Thesis Advisor

TEACHING EXPERIENCE

Course Number	Course Title	Location	Date Offered
SENG 585	Reliability in Systems Design	AFIT (In-Resident)	Winter 2014
STAT 687	Math of Reliability I	AFIT (In-Resident)	Summer 2014
SENG 585	Reliability in Systems Design	AFIT (In-Resident)	Winter 2015
STAT 687	Math of Reliability I	AFIT (In-Resident)	Summer 2015
LOGM 634	Reliability, Maintability, & Availability Engineering	Advanced Studies in Air Mobility Fort Dix, NJ	Winter 2016
RSCH 630	Research Methods	AFIT (In-Resident)	Spring 2016
SENG 699	Advanced R Programming	AFIT (In-Resident)	Summer 2016
SENG 585	Reliability in Systems Design	AFIT (In-Resident)	Fall 2016
STAT 687	Math of Reliability I	AFIT (In-Resident)	Fall 2016
LOGM 634	Reliability, Maintability, & Availability Engineering	Advanced Studies in Air Mobility Fort Dix, NJ	Winter 2017
RSCH 630	Research Methods	AFIT (In-Resident)	Spring 2017
SENG 685	Reliability Engineering	AFIT (In-Resident)	Spring 2017

OTHER WORK EXPERIENCE

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
- 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