

Keshmiri, Shawn S.
Professor, Aerospace Engineering
University of Kansas, Lawrence, KS, 66045, USA
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EDUCATION

Shiraz University	Mechanical Engineering	BS 1993
CSULA University	Mechanical Engineering	MS 2004
University of Kansas	Aerospace Engineering	PhD 2007
University of Kansas	Dynamics and Control	Postdoctoral 2008

EMPLOYMENT HISTORY

- Professor, Aerospace Engineering, University of Kansas, 2019-Present.
- Associate Professor, Aerospace Engineering, University of Kansas, 2014-2019.
- Assistant Professor, Aerospace Engineering, University of Kansas, 2008-14.
- Postdoctoral Researcher in the Center for Remote Sensing of Ice Sheets, University of Kansas, NSF Grant #AST-042-4589, 2007-08.
- Graduate Research Assistant, University of Kansas, NASA Grant # NCC4-158 and U.S. Air Force Grant # F49620-01-1-0489, 2004-07.
- Graduate Research Assistant, the Multidisciplinary Flight Dynamics and Control Laboratory of California State University, Los Angeles, NASA Grant # NAGA-175 and U.S. Air Force Grant # F49620-01-1-0489, 2002-04.

Honors and Awards

1. **Miller Scholar Award**, School of Engineering, 2018-19.
2. The **Outstanding Educator Award**, KU Aerospace Engineering, April 2019.
3. University of Kansas **H.O.P.E.** Teaching Award (Honor for the Outstanding Progressive Educator), 2018.
4. **John E. and Winifred E. Sharp Teaching Professor**, University of Kansas School of Engineering 2017-19.
5. Faculty Fellow, University of Kansas Honors Program, November 2018 – present.
6. The **Outstanding Educator Award**, KU Aerospace Engineering, May 2015.
7. **AIAA Associate Fellow**, 2015.
8. **Miller Scholar Award**, School of Engineering, 2014-15.
9. Selected by KU Engineering students as the **Gould Award winner** and Outstanding Educator of KU School of Engineering, May 2013.
10. Selected by KU Aerospace Engineering graduate students and **honored at the annual Celebration of Teaching**, April 2013.
11. The **Outstanding Educator Award**, KU Aerospace Engineering, May 2012.
12. Recipient of the National Science Foundation's **Antarctic Service Medal of the United States**, 2012.
13. **Miller Scholar Award**, School of Engineering, 2011-12.
14. **Bellows Scholar Award**, recognizes overall achievement in teaching, research and service., 2011

15. **Miller Scholar Award**, School of Engineering, 2009-10.

RESEARCH RECORD

Research Publications

Selected Peer-Reviewed Publications

2020

1. Blevins, A., Keshmiri, S., Shukla D., and Godfrey, G. "Dubins Path Guidance for Fixed-Wing UAS Remote Sensing Applications," AIAA Scitech 2020 Forum, <https://arc.aiaa.org/doi/10.2514/6.2020-1236>.
2. Blevins, A., Keshmiri, S., Shukla D., and Godfrey, G. , "Analysis of TSP Heuristics for Fuel-Constrained UAS Path Planning applied to Polar Research Missions," AIAA Scitech 2020 Forum, <https://arc.aiaa.org/doi/10.2514/6.2020-2198>

2019

3. Kim, A. R., Keshmiri, S., Blevins, A., Shukla D., and Huang, W. "Control of Multi-Agent Collaborative Fixed-Wing UASs in Unstructured Environment," *Journal of Intelligent & Robotic Systems* (2019), pp 1–21, <https://doi.org/10.1007/s10846-019-01057-3>.
4. Wenju Xu, Keshmiri Shawn, Guanghui Wang, "Stacked Wasserstein Autoencoder," *Elsevier Neurocomputing*, Volume 363, 21 October 2019, Pages 195204, <https://doi.org/10.1016/j.neucom.2019.06.096>.
5. Wenju Xu, Keshmiri Shawn, Guanghui Wang, "Toward Learning a Unified Many-to-Many Mapping for Diverse Image Translation, Pattern Recognition," *Elsevier Pattern Recognition Journal*, 2019, ISSN 0031-3203, <https://www.sciencedirect.com/science/article/pii/S003132031930192X>.
6. Xu, W., Keshmiri, S., and Wang, G., "Adversarially Approximated Autoencoder for Image Generation and Manipulation," *IEEE Transactions on Multimedia*, MM-009205.R1, 2019, <https://ieeexplore.ieee.org/document/8638964>.
7. Arnold, E., Leuschen, C., Rodriguez-Morales, F., Li, J., Paden, J., Hale, R., & Keshmiri, S., "CReSIS airborne radars and platforms for ice and snow sounding," *Annals of Glaciology*, 1-10. doi:10.1017/aog.2019.37, <https://doi.org/10.1017/aog.2019.37>
8. Mckinnis, A. and Keshmiri, S., "Dynamic Modeling and Controllability Analysis of a Moderately Damaged Unmanned Aerial System," *IEEE Transactions on Multimedia* (Volume: 21 , Issue: 9 , Sept. 2019), [10.1109/TMM.2019.2898777](https://doi.org/10.1109/TMM.2019.2898777).

2018

9. Keshmiri, S., Kim, A. R., Blevins, A., Shukla D., and Huang, W. "Control of Multi-Agent Collaborative Fixed-Wing UASs in Unstructured Environment," 2018 International Conference on Unmanned Aircraft Systems (ICUAS), Dallas, TX, 2018, pp. 1165-1173, DOI: [10.1109/ICUAS.2018.8453358](https://doi.org/10.1109/ICUAS.2018.8453358).

10. Keshmiri, S., Kim, A. R., Shukla D., Blevins, A., and Ewing, M. "Flight Test Validation of Collision and Obstacle Avoidance in Fixed-Wing UASs with High Speeds Using Morphing Potential Field," 2018 International Conference on Unmanned Aircraft Systems (ICUAS), Dallas, TX, 2018, pp. 589-598, DOI: [10.1109/ICUAS.2018.8453299](https://doi.org/10.1109/ICUAS.2018.8453299).
11. Kim, A. R., Shukla D., Blevins, A., Keshmiri, S., and Ewing, M., "Validation and Verification of GNC for Large Fixed-Wing Unmanned Aerial System in Unstructured and Noisy Environment," 2018 International Conference on Unmanned Aircraft Systems (ICUAS), Dallas, TX, 2018, pp. 1388-1397, DOI: [10.1109/ICUAS.2018.8453413](https://doi.org/10.1109/ICUAS.2018.8453413).
12. Aaron T. Blevins, A R. Kim, Daksh Shukla, Shawn S. Keshmiri, and Weizhang Huang. "Validation and Verification Flight Tests of Fixed-Wing Collaborative UASs with High Speeds and High Inertias", 2018 Flight Testing Conference, AIAA AVIATION Forum, AIAA 2018-4280, <https://doi.org/10.2514/6.2018-4280>.
13. Daksh Skukla, A R. Kim, Aaron T. Blevins, Shawn S. Keshmiri, and Mark Ewing. "Validation and Verification Flight Testing of UAS Morphing Potential Field Collision Avoidance Algorithms", 2018 Flight Testing Conference, AIAA AVIATION Forum, AIAA 2018-4279, <https://doi.org/10.2514/6.2018-4279>.
14. Keshmiri, S., Blevins, A., and Kim, A., "Active Learning and Student Engagement in Flight Dynamics and Control Classes" 2018 ASEE Annual Conference and Exposition, Paper ID #21531, <https://peer.asee.org/30375>.
15. Keshmiri, S.; Hauptman, D.; Daksh Shukla; Ewing, M. "Scalability of Mesh Network Telemetry for Swarms of Unmanned Aerial Systems," International Telemetry Conference (ITC) 2018, <http://hdl.handle.net/10150/631704>.
16. Arnold, E.; Rodriguez-Morales, F.; Paden, J.; Leuschen, C.; Keshmiri, S.; Yan, S.; Ewing, M.; Hale, R.; Mahmood, A.; Blevins, A.; Mishra, A.; Karidi, T.; Miller, B.; Sonntag, J., "HF/VHF Radar Sounding of Ice from Manned and Unmanned Airborne Platforms," *Geosciences*, 8(5):182, 2018, DOI <https://doi.org/10.3390/geosciences8050182>.
17. Arnold, E., Ewing, M., Hale, R., Keshmiri, S., Leuschen, S., Li, J., Paden, J., Fernando Rodriguez-Morales, Victor Berger, "Multi-Spectral Radar Measurements of Ice and Snow Using Manned and Unmanned Aircraft", IEEE Latin America Transactions (Volume: 16 , Issue: 9 , September 2018), *IEEE Latin America Transactions*, 2018, DOI [10.1109/TLA.2018.8789571](https://doi.org/10.1109/TLA.2018.8789571).

2017

18. Keshmiri, S.; Lan, E.; and Hale, R., "Nonlinear aerodynamics of an unmanned aircraft in wind shear", *Aircraft Engineering and Aerospace Technology*, Vol. 89 Iss: 1, pp.39 – 51, 2017, DOI: [10.1108/AEAT-11-2014-0181](https://doi.org/10.1108/AEAT-11-2014-0181).
19. Lan, E., Keshmiri, S., "Analysis of the crash of a transport aircraft and assessment of fuzzy-logic stall recovery" Elsevier Masson, *Journal of Aerospace Science and Technology*, Vol. 71, pages 231-244, 2017, <https://doi.org/10.1016/j.ast.2017.09.028>.

20. Vedantam, M.; Keshmiri, S., Garcia; and G., Huang, W., "Fixed Wing Aircraft Perching," Fixed Wing Aircraft Perching", AIAA Guidance, Navigation, and Control Conference, AIAA SciTech Forum, AIAA 2017-1915, <https://doi.org/10.2514/6.2017-1915>.
21. Keshmiri, S.; Arnold, E., Blevins, A., et al, 'Radar Echo Sounding of Russel Glacier at 35 MHz Using Compact Radar Systems on Small Unmanned Aerial Vehicles," IEEE IGARSS, FR3.L11.4, pp. 5900-5903, 2017, DOI: [10.1109/IGARSS.2017.8128352](https://doi.org/10.1109/IGARSS.2017.8128352).
22. Garcia, G., and Keshmiri, S., "Nonlinear Control based on H-Infinity Theory for Autonomous Aerial Vehicle," ICUAS, IEEE, 2017, DOI: [10.1109/ICUAS.2017.7991395](https://doi.org/10.1109/ICUAS.2017.7991395).
23. Kolpuke, S., Keshmiri, S., and Ewing, M., "Bio-inspired Navigation Algorithm for GPS Denial Modes," ICUAS, IEEE, 2017, DOI: [10.1109/ICUAS.2017.7991480](https://doi.org/10.1109/ICUAS.2017.7991480).
24. Garcia, G., Kim, A., Keshmiri, S., and Jackson, E. "Modeling and Flight Control of a Commercial Nano Quadrotor," ICUAS, IEEE, 2017, DOI: [10.1109/ICUAS.2017.7991439](https://doi.org/10.1109/ICUAS.2017.7991439).
25. Rodriguez-Morales, E Arnold, R Hale, S Keshmiri, C Leuschen, J Li, J Paden, "Multi-spectral radar measurements of ice and snow using manned and unmanned aircraft," 2017 First IEEE International Symposium of Geoscience and Remote Sensing (GRSS-CHILE), DOI: [10.1109/GR`SS-CHILE.2017.7996024](https://doi.org/10.1109/GR`SS-CHILE.2017.7996024).
26. Blunt, S.; Allen, C.; Arnold, E.; Hale, R.; Hui, R.; Keshmiri, S.; et al. "Radar research at the University of Kansas," *SPIE, Radar Sensor Technology XXI, Vol 10188, 2017*, <https://doi.org/10.1117/12.2268911>.

2016

27. Garcia, G., and Keshmiri, S., "Biologically inspired trajectory generation for swarming UAVs using topological distances," *Elsevier Aerospace Science and Technology 54 (2016) 312–319*, *10.1016/j.ast.2016.04.028*, 2016, <https://doi.org/10.1016/j.ast.2016.04.028>.
28. Kim, B., Keshmiri, S., Huang, W., Garcia, G., "Guidance of Multi-Agent Fixed-Wing Aircraft Using a Moving Mesh Method," *World Scientific, Unmanned Systems, Ms. No. US-D-15-00018R1*, 2016, <https://doi.org/10.1142/S2301385016500084>.
29. Vivekanandan, P., Garcia, G., Yun, H., and Keshmiri, S., "A Simplex Architecture for Intelligent and Safe Unmanned Aerial Vehicles," IEEE International Conference on Embedded and Real-Time Computing Systems and Applications (RTCSA), 2016 (*finalist in the best paper competition*), DOI: [10.1109/RTCSA.2016.17](https://doi.org/10.1109/RTCSA.2016.17).

2015

30. Garcia, G., Keshmiri, S., "Nonlinear Model Predictive Controller Robustness Extension for Unmanned Aircraft," *International Journal of Intelligent Unmanned Systems, IJIUS-*

01-2015-0002, May 2015, <https://www.emerald.com/insight/content/doi/10.1108/IJIUS-01-2015-0002/full/html>.

31. A Ram Kim, Keshmiri, S., Huang, W., Garcia, G., "Guidance of Multi-Agent Fixed-Wing Aircraft Using Moving Mesh Methods," International Conference on Unmanned Aircraft Systems, Pages: 218 - 225, 2015, DOI: [10.1109/ICUAS.2015.7152294](https://doi.org/10.1109/ICUAS.2015.7152294).
32. Smith, N., Lykins, R., Keshmiri, S., "Effect of Competing V-Tail Models on a UAS 6-DOF Nonlinear Simulation," International Conference on Unmanned Aircraft Systems, Pages: 1330 - 1337, 2015, DOI: [10.1109/ICUAS.2015.7152427](https://doi.org/10.1109/ICUAS.2015.7152427).
33. Garcia, G., Keshmiri, S., "Nonlinear H-infinity Control applied to a UAS in Trajectory Following," AIAA Guidance, Navigation, and Control Conference, AIAA 2015-1319, <https://doi.org/10.2514/6.2015-1319>.
34. Garcia, G., Keshmiri, S., Huang, W., "Recovery of an Aircraft from the Loss of Control Using Open Final Time Dynamic Optimization and Receding Horizon Control," AIAA Guidance, Navigation, and Control Conference, AIAA 2015-1545, <https://doi.org/10.2514/6.2015-1545>.
35. Stastny, T.J., Garcia, G., Keshmiri, S., "Robust Three-Dimensional Collision Avoidance for Fixed-Wing Unmanned Aerial Systems," AIAA Guidance, Navigation, and Control Conference, AIAA 2015-1988, <https://doi.org/10.2514/6.2015-1988>.
36. Farokhi, S., Keshmiri, S., Taghavi, R., "Bio-Inspired Air Data Sensing Probe for High Angles of Attack and Sideslip", 53rd AIAA Aerospace Sciences Meeting, AIAA 2015-1921, <https://doi.org/10.2514/6.2015-1921>.

2014

37. Garcia, G.A.; Keshmiri, S.S.; Stastny, T., "Robust and Adaptive Nonlinear Model Predictive Controller for Unsteady and Highly Nonlinear Unmanned Aircraft," *Control Systems Technology, IEEE Transactions on*, vol.PP, no.99, pp.1,1 DOI: [10.1109/TCST.2014.2377711](https://doi.org/10.1109/TCST.2014.2377711).
38. Stastny, T.J., Garcia, G., Keshmiri, S., "Collision and Obstacle Avoidance in Unmanned Aerial Systems Using Morphing Potential Field Navigation and Nonlinear Model Predictive Control," *ASME Journal of Dynamic Systems, Measurement and Control*, ASME, 2014, <https://doi.org/10.1115/1.4028034>.
39. Leuschen, C.; Hale, R.; Keshmiri, S.; Yan, J.; Rodriguez-Morales, F.; Mahmood, A.; Gogineni, S., "UAS-Based Radar Sounding of the Polar Ice Sheets," *Geoscience and Remote Sensing Magazine, IEEE*, vol.2, no.1, pp.8,17, March 2014, DOI: [10.1109/MGRS.2014.2306353](https://doi.org/10.1109/MGRS.2014.2306353).

2013

40. Garcia, G., Keshmiri, S., "Online Artificial Neural Network Model Based Nonlinear Model Predictive Controller for the Meridian UAS," *In Press, Wiley International Journal of Robust and Nonlinear Control*, Volume 23, Issue 15, pages 1657–1681, October 2013, <https://doi.org/10.1002/rnc.3037>.
41. Garcia, G., Keshmiri, S., "Adaptive and Resilient Flight Control System for a Small Unmanned Aerial System," *In Press, International Journal of Aerospace Engineering*, Volume 2013, Article ID 289357, <http://dx.doi.org/10.1155/2013/289357>.

42. Stastny, T.J., Lykins, R., and Keshmiri, S., "Nonlinear Parameter Estimation of Unmanned Aerial Vehicle in Wind Shear Using Artificial Neural Networks," AIAA GNC, 2013-4768.
43. Shi, L., Allen, C., Ewing, M., Keshmiri, S., Zakharov, M., Florencio, F., Niakan, N., and Knight, R., "Multichannel Sense-and-Avoid Radar for Small UAVs," Proceeding of 32nd Digital Avionics System Conference, Syracuse, NY, 2013.

2012

44. Lan, E., Keshmiri, S., Hale, R., "Fuzzy-Logic Modeling of a Rolling Unmanned Vehicle in Antarctica Wind Shear," In Press, , *AIAA Journal of Guidance, Control, and Dynamics*, AIAA55541 Volume 35, Number 5, 2012, <https://doi.org/10.2514/1.55541>.
45. Garcia, G., Keshmiri, S., "Online ANN for Aerodynamic Forces and Nonlinear Estimation used in a NMPC Formulation," AIAA GNC Conference, AIAA-2012-4984.
46. Garcia, G., Keshmiri, S., "Integrated Kalman Filter for a Flight Control System with Redundant Measurements," Infotech@Aerospace 2012, AIAA 2012-2499.
47. Bowman, A., Keshmiri, S., "An Empirical Method for Estimating Moments of Inertia of Light Unmanned Air Vehicles" Infotech@Aerospace 2012, AIAA 2012-2598.

2011

48. Garcia, G., Keshmiri, S., and Colgren, R., "H-Infinity Gain Scheduling Design for the Meridian UAS for a Broader Range of Operation and for Fault Tolerant Applications," *In Press, IEEE Control and Automation (ICCA)*, ISSN : 1948-3449, pages 1174 – 1180, 978-1-4577-1476-4/11, 2011, DOI: [10.1109/ICCA.2011.6137962](https://doi.org/10.1109/ICCA.2011.6137962).
49. Garcia, G., Keshmiri, S., "Nonlinear Model Predictive Controller Applied to a Fixed-Wing UAV," AIAA GNC Conference, Portland, Oregon, 2011, <https://doi.org/10.2514/6.2006-6685>.
50. Garcia, G., Keshmiri, S., "Design and Application of an Extended Kalman Filter in a Flight Control System Development," AIAA Infotech@Aerospace Conference, St. Louis, Missouri, 2011, <https://doi.org/10.2514/6.2011-1477>.
51. Jones, V., Keshmiri, S., "Improving UAV Safety During Piloted Flight Phases by Keeping the Autonomous Controller in the Loop," AIAA Infotech@Aerospace Conference, St. Louis, Missouri, 2011, <https://doi.org/10.2514/6.2011-1604>.
52. Lykins, R., Keshmiri, S., Riley, R., Garcia, G., "Modal Analysis of 1/3-Scale Yak-54 Aircraft Through Simulation and Flight Testing," AIAA Atmospheric Mechanics Conference, AIAA-2011-6443.

2010

53. Garcia, G., Keshmiri, S., and Colgren, R., "Advanced H-Infinity Trainer Autopilot," AIAA GNC Conference, AIAA-2010-8363, Toronto, Canada, 2010, <https://doi.org/10.2514/6.2010-8363>.
54. Lykins, R., Keshmiri, S., "System Identification of a COTS Autopilot System Using Flight Test Data," AIAA MST Conference, AIAA-2010-7648, Toronto, Canada, August 2010.
55. Royer, D., Keshmiri, S., Sweeten, B., "Modeling and Sensitivity Analysis of the Meridian Unmanned Aircraft," AIAA Infotech@Aerospace Conference, AIAA-2010-3468, Atlanta, Georgia, 2010.

56. Jones, V., and Keshmiri, S., "First Flight Risk Mitigation Related to Pilot Unfamiliarity with a New UAV Platform," AIAA Infotech@Aerospace Conference, AIAA-2010-3489, Atlanta, Georgia, 2010, <https://doi.org/10.2514/6.2010-3468>.
57. Esposito, J., Keshmiri, S., "Rapid Hardware Interfacing and Software Development for Embedded Devices Using Simulink," AIAA Infotech@Aerospace Conference, AIAA-2010-3415, Atlanta, Georgia, 2010.

2009

58. Colgren, R., Keshmiri, Keshmiri, Sh., Mirmirani, M., "Nonlinear Ten-Degree-of-Freedom Dynamics Model of a Generic Hypersonic Vehicle," *In Press, Journal of Aircraft 2009 0021-8669 vol.46 no.3 (800-813)*, <https://doi.org/10.2514/1.35644>.
59. Leong, E., Keshmiri, S., Jager, R., "Evaluation of a COTS Autopilot and Avionics System for UAVs," AIAA Infotech@Aerospace Conference and AIAA Unmanned...Unlimited (UU) Conference, AIAA-2009-1963, Seattle, Washington, 2009.
60. Sweeten, B., Royer, D., Keshmiri, S., "The Meridian UAV Flight Performance Analysis Using Analytical and Experimental Data," AIAA Infotech@Aerospace Conference and AIAA Unmanned...Unlimited (UU) Conference, AIAA-2009-1899, Seattle, Washington, 2009.

2004-08

61. Leong, E., Jager, R., Keshmiri, sh., and Colgren, R., "Development of a Pilot Training Platform for UAVs Using a 6DOF Nonlinear Model with Flight Test Validation," AIAA MST Conference and Exhibit, AIAA-2008-6368, 2008, Honolulu, Hawaii.
62. Keshmiri, sh., Leong, E., Jager, R., and Hale, R., "Modeling and Simulation of the Yak-54 Scaled Unmanned Aerial Vehicle Using Parameter and System Identification," AIAA AFM Conference and Exhibit, AIAA-2008-6900, 2008, Honolulu, Hawaii.
63. Keshmiri, sh., Colgren, R., and Mirmirani, M., "Nonlinear and Linear Longitudinal and Lateral-Directional Dynamical Model of Air-Breathing Hypersonic Vehicle," 15th AIAA International Space Planes and Hypersonic Systems and Technologies Conference, AIAA-2008-2531, 2008, Dayton, Ohio.
64. Keshmiri, sh., Colgren, R., and Mirmirani, M., "Six DoF Linear Equations of Motion for a Generic Hypersonic Vehicle," the AIAA AFM Conference, AIAA-2007-6626, 2007, South Carolina.
65. Keshmiri, sh., Farokhi, S., Colgren, R., and Mirmirani, M., "Airbreathing Combined Cycle Engine for a Generic Hypersonic Vehicle," 43rd AIAA/ASME/SAE/ASEE Joint Propulsion Conference & Exhibit, AIAA-2007-5373, 2007, Cincinnati, OH.
66. Keshmiri, sh., Colgren, R., and Mirmirani, M., "Modeling and Simulation of a Generic Hypersonic Vehicle using Merged Aerodynamic Models," 14th AIAA/AHI SPHST Conference, AIAA-2006-8087, Canberra, Australia.
67. Keshmiri, sh., Lan, E., Colgren, R., and Mirmirani, M., "Trajectory Optimization for a Generic Hypersonic Vehicle," 14th AIAA/AHI SPHST Conference, AIAA-2006-8157, 2006, Canberra, Australia.
68. Keshmiri, sh., Colgren, R., Farokhi, S., and Mirmirani, M., "Ramjet and Scramjet Engine Cycle Analysis for a Generic Hypersonic Vehicle," 14th AIAA/AHI SPHST Conference, AIAA 2006-8158, 2006, Canberra, Australia.

69. Keshmiri, sh., Colgren, R., and Mirmirani, M., “Six-DOF Modeling and Simulation of a Generic Hypersonic Vehicle, for Control and Navigation Purposes,” Shahriar Keshmiri, Richard Colgren, and Maj Mirmirani, the AIAA GNC Conference, AIAA-2006-6694, Keystone, Colorado, 2006-6694.
70. Keshmiri, sh., Colgren, R., and Mirmirani, M. “Development of an Aerodynamic Database for a Generic Hypersonic Air Vehicle,” AIAA MST Conference, AIAA-2005-35352, San Francisco, California.
71. “Six-DOF Modeling and Simulation of a Generic Hypersonic Vehicle for Conceptual Design Studies,” AIAA MST, AIAA-2004-4805, 2004, Providence, Rhode Island.

Patents

1. Co-inventor of an approved patents on “Fluid Movement Sensor with Instrumented Centerbody,” U.S. RQN Ref.: 48299-01001, Filed: February 5, 2019,
<https://patentimages.storage.googleapis.com/3c/95/4c/a57b99111cc3f6/US20190242923A1.pdf>.
2. Co-inventor of an issued patents on “Systems, Methods and Devices for Fluid Data Sensing,” U.S. Patent Number 10,018,648, issued on July 10, 2018,
<https://patentimages.storage.googleapis.com/cc/e1/a2/a40ff8c029c07f/US20180321272A1.pdf>.
3. Co-inventor of an issued patents on “Techniques for Navigation of UAVs Using Ground-Based Transmitters,” Patent# 9,945,931, Issued: April 17, 2018,
<https://patentimages.storage.googleapis.com/b4/55/10/976e596d691406/US9945931.pdf>.
4. Co-inventor of an issued patents on “Systems, Methods, and Devices for Fluid Data Sensing”, Patent# US 9,541,429 B2, Issued: Jan. 10, 2017,
<https://patentimages.storage.googleapis.com/e3/61/ae/8c2c20d7a39319/US20170122973A1.pdf>.

Grants and/or other Funded Projects

External Funding

Funded Proposals

1. Name: Learning and Curious Autopilot for Unmanned Aerial Systems (Phase II)
Role: KU PI
Co-I: Mark Ewing, and Heechul Yun
Agency: NASA and DARcorp
Amount: \$750,000
Period: 01/07/2018-12/31/2018
2. Name: Helheim Glacier/Sermilik Fjord Research Collaboration
PI: Carl Leuschen

Role: CO-PI
Agency: Heising-Simons Foundation
Amount: \$600,000
Period: 05/01/2019-04/30/2021

3. Name: Airborne Snow Depth Retrieval for Improved Hydrological Modeling
PI: Emily Arnold
Role: CO-PI
Agency: NOAA
Amount: \$499,926
Period: 09/01/2019-08/30/2021
4. Name: Learning and Curious Autopilot for Unmanned Aerial Systems (Phase I)
Role: KU PI
Co-I: Nicole Beckage, and Heechul Yun
Agency: NASA and DARcorp
Amount: \$150,000
Period: 01/07/2018-12/31/2018
5. Name: Open System Architecture (OSA) and Autonomous Flight Control Enhancements for Small Unmanned Systems (UAS).
Role: PI
Co-I: Mark Ewing and Heechul Yun
Agency: Lockheed Martin Advanced Development Programs (ADP)
Amount: \$129,000
Period: 01/08/2017-12/31/2018
6. Name: Multichannel Sense-and-Avoid Radar for Small UAVs
Role: CO-PI
PI: Christopher Allen
Agency: NASA
Amount: \$800,000
Period: 01/08/2015-02/28/2018
7. Name: Active Wing Shaping Control of Morphing Aircraft
Role: KU PI
Co-I: N.A.
Agency: NASA
Amount: \$104,951
Period: 08/01/2015-07/31/2018
8. Name: Determination of appropriate locations for Angle of Attack (AOA) ports on the body of the Garmin specific air data probe (GDC7500).
Role: Co-I
PI: Saeed Farokhi

Agency: Garmin
Amount: \$50,000
Period: 09/01/2017-05/31/2018

9. Name: Dynamic Modeling and Control of a Quadcopter in Unstructured Environments

Role: KU PI
Co-I: N.A.
Agency: Aerotenna
Amount: \$73,662
Period: 01/01/2016-08/31/2016

10. Name: Preventative Monitoring of Infectious Agents-PREMONITION

Role: KU PI
Co-I: M. Ewing
Agency: Microsoft Research- IARPA
Amount: \$110,000
Period: 08/08/2015-05/31/2016

11. Name: Edge 540 V3 Aerobatic Aircraft Performance Analysis

Role: KU PI
Co-I: M. Ewing
Agency: Microsoft Research- IARPA
Amount: \$10,000
Period: 08/08/2015-09/07/2015

12. Name: Integration and Flight Test of Active Flow Control Technologies

Role: CO-PI
PI: R. Wozidlo
Agency: NASA
Amount: \$ 25,793
Period: 10/01/2014-05/31/2015

13. Name: Multi-Agent Airborne Laboratory for Cryospheric Remote Sensing

Role: PI
Co-I: R. Hale, C. Leuschen, J. Yan, F. Rodriguez-Morales, J. Paden, M. Ewing
Agency: Paul Allen Family Foundation
Amount: \$200,000
Period: 01/21/2014-5/30/2016

14. Name: Center for Remote Sensing of Ice Sheets (CReSIS)

Role: Co-I

PI: Prasad Gogineni
Agency: NSF
Amount: \$36,099,945
Period: 6/01/2005-5/31/2015

The total Co-I allocation:

2016: \$100,000
2015: \$132,000
2014: \$166,000
2013: \$166,000
2012: \$200,000
2011: \$200,000
2010: \$200,000
2009: \$132,000
2008: \$153,540

15. Name: IChARGE - Interdisciplinary Challenge for Recharging Using Green Energy
Role: Co-I
Agency: DOE
Amount: \$25,000
Period: 07/01/2013-06/30/2014

16. Name: Multichannel Sense-and-Avoid Radar for Small UAVs
Role: Co-I
PI: Chris Allen
Agency: NASA
Amount: \$200,000
Period: 11/15/2012-11/14/2013

The total Co-I allocation:

2013: \$66,000

17. Name: Low-Altitude Laser Altimeter to Assist UAS Autolanding and Improve State Estimations
Role: PI
Co-I: Chris Allen
Agency: Transportation Research Institute
Amount: \$89,000
Period: 10/01/2011-12/31/2012

The total PI allocation:

2012: \$48,950

18. Name: KUAE Embedded Control Systems Development Testbed & Laboratory
Role: PI
Agency: Transportation Research Institute
Amount: \$45,000
Period: 8/1/2010-7/30/2011

Dissertation/Thesis/Postdoctoral/Other Supervision

Postdoctoral

1. Dr. Gonzalo Garcia, February 2012 – 2016.

Visitor Scholar

1. Dr. Seyool Oh, Flight Control engineer in Korea Aerospace Industries, 2019-2020.
2. Dr. Duhui Liu, Associate Professor, Civil Aviation Flight University of China, Status: completed, 2012 – 2013.
3. Hyungkook Joo, L.G. Research, South Korea, Status: completed, 2017-18.

Chair of Graduate Student Dissertation and Thesis (Completed)

1. Hady Benyamin, M.S. in Aerospace Engineering, Status: in progress. 2016 – 2019.
2. A Ram Kim, Ph.D. in Aerospace Engineering, Status: completed. 2013 – 2018.
3. Julien Esposito, Ph.D. in Aerospace Engineering, Status: completed. 2006 – 2015.
4. Katrina Legursky, Ph.D. in Aerospace Engineering, Status: completed. 2008 – 2013 (Co-chair).
5. Gonzalo Garcia, Ph.D. in Aerospace Engineering, Status: completed. 2009 – 2013.
6. Shriniwas Kolpuke, M.S. in Aerospace Engineering, Status: completed. 2014 – 2017.
7. Nathan Smith, M.S. in Aerospace Engineering, Status: completed. 2014 – 2016.
8. Alec Matthew Bowman, M.S. in Aerospace Engineering, Status: completed. 2011 – 2016.
9. T.J. Stastny, M.S. in Aerospace Engineering, Status: completed. 2012 – 2014.
10. Ryan Lykins, M.S. in Aerospace Engineering, Status: completed. 2010 – 2014.
11. Robert Burns, M.S. in Aerospace Engineering, Status: completed. 2010 – 2011.
12. David Royer, M.S. in Aerospace Engineering, Status: completed. 2008 – 2010.
13. Casey Sweeten, M.S. in Aerospace Engineering, Status: completed. 2008 – 2010.
14. Jonathan Tom, M.S. in Aerospace Engineering, Status: completed. 2008 – 2010.

Chair of Graduate Student Dissertation and Thesis (in Pipeline)

1. Wenju Xu, Ph.D. in Aerospace Engineering, Status: In progress. 2015 – 2019.
2. Aaron Blevins, Ph.D. in Aerospace Engineering, Status: In progress. 2015 – 2020.
3. Chris Hedden, Ph.D. in Aerospace Engineering, Status: In progress. 2008 – 2020.
4. Daksh Shukla, Ph.D. in Aerospace Engineering, Status: In progress. 2016 – 2020.
5. Mozammal Chowdhury, Ph.D. in Aerospace Engineering, Status: In progress. 2016 – 2021.
6. Thomas Le Pichon, Ph.D. in Aerospace Engineering, Status: in progress. 2016 – 2021.
7. Aaron McKinnis, Ph.D. in Aerospace Engineering, Status: in progress. 2016 – 2023.
8. Dustin Hauptman, M.S. in Computer Science, Status: in progress. 2016 – 2018, (Co-chair).

Research Advisor of Undergraduate Research Assistant

1. Grant Godfrey, 2016-Present.
2. Jeffry Xu, 2018-Present.
3. Jon Lofthouse, 2018-Present.
4. Aaron McKinnis, 2018 – 2019.
5. Dustin Hauptman, 2014 – 2017.
6. Mihir Vedantam, 2014 – 2017.
7. Thomas Le Pichon, 2014 – 2017.
8. Adam Liles, 2015 – 2016.
9. Martin Mendoza, 2015.
10. Brooks Sargent, 2015.
11. Marwan Dessouki, 2015.
12. Jordan Dixton, 2015.
13. Kyri Borton, 2015.
14. John Ink 2015.
15. Angela Wright, 2014 – 2016.
16. Samuel Cott, 2013.
17. Nathan Smith, 2012-13.
18. Mary Pat Whittaker, 2012-13.
19. Ryan Endres, 2012.
20. Tabitha Teo, 2012.
21. T.J. Stastny, 2011.

22. Sarah Elizabeth McCandless, 2011.
23. Kyle Brehm, 2011.
24. Ali Mahmood, 2011.
25. Matthew Austin, 2010.
26. Zaki Abou Ghazali, 2010.
27. Lee Clemon, 2010.
28. David Royer 2009.
29. Felix Lee, 2009.
30. Sidar Ravi, 2009.
31. Carly Sakumura, 2009.
32. William Pflug, 2009.
33. Ryan Lykins, 2009.
34. Cody Harryman, 2009.

Courses Taught (2011-19)

1. AE-550 Dynamics of Flight I- 4 Units- Fall 2019, 62 Students.
2. HNRS-190 Honors first-year seminar, 1 Unit, Fall 2019, 10 Students.
3. AE-551 Dynamics of Flight II- 4 Units- Spring 2019, 50 Students.
4. AE-550 Dynamics of Flight I- 4 Units- Fall 2018, 54 Students.
5. AE-245 Introduction to Aerospace Engineering, 3 Units, Fall 2018, 89 Students.
6. HNRS-190 Honors first-year seminar, 1 Unit, Fall 2018, 11 Students.
7. AE-750 Optimal Control, Spring 2018, 5 Students.
8. AE-592 Special Project Undergraduate- 1 Unit- Spring 2018, 1 Student.
9. AE-551/2 Dynamics of Flight II- 4 Units- Spring 2018, 39 Students.
10. AE-592 Special Project Undergraduate- 1 Unit- Fall 2017, 1 Student.
11. AE-550 Dynamics of Flight I- 4 Units- Fall 2017, 42 Students.
12. AE-245 Introduction to Aerospace Engineering, 3 Units, Fall 2017, 90 Students.
13. AE-245 Introduction to Aerospace Engineering, 3 Units, Fall 2016, 96 Students.
14. AE-732 Introduction to Flight Test Engineering, 3 Units- Spring 2016, 15 Students.
15. AE-592 Special Project Undergraduate- 1 Unit- Spring 2016, 1 Student.
16. AE-551/2 Dynamics of Flight II- 4 Units- Spring 2016, 31 Students.
17. AE-245 Introduction to Aerospace Engineering, 3 Units, Fall 2015, 70 Students.
18. AE-592 Special Project Undergraduate- 1 Unit- Summer 2015, 1 Students.
19. AE-551 Dynamics of Flight II- 4 Units- Spring 2015, 35 Students.
20. AE-732 Introduction to Flight Test Engineering - 3 Units, Spring 2015, 10 Students.
21. AE-245 Introduction to Aerospace Engineering, 3 Units, Fall 2014, 63 Students
22. AE-790 Special Problem in Aerospace Engineering- 3 Units, Spring 2014, 1 Student.
23. AE-551 Dynamics of Flight II- 4 Units- Spring 2014, 32 Students

24. AE-550 Dynamic of Flight I - 4 Units- Fall 2013, 38 Students.
25. AE-755 Robust and Nonlinear Control (Co-Teaching) - 3 Units, Spring 2013, 4 Students.
26. AE-592 Special Project in Aerospace Engineering - 1Units, Summer 2013, 1 Student
27. AE-430 Aerospace Engineering Instrumentation- 3 Units, Spring 2013, 19 Students.
28. AE-790 Special Problem in Aerospace Engineering- 3 Units, Spring 2013, 2 Students.
29. AE-550 Dynamic of Flight I - 4 Units- Fall 2012, 27 Students.
30. AE-996 Ph. D. Dissertation- 3 Units, Summer 2012, 2 Students.
31. AE-430 Aerospace Engineering Instrumentation- 3 Units, Spring 2012, 14 Students.
32. AE-755 Robust and Nonlinear Control (Co-Teaching) - 3 Units, Spring 2012, 3 Students.
33. AE-550 Dynamic of Flight I - 4 Units- Fall 2011, 27 Students
34. AE-430 Aerospace Engineering Instrumentation- 3 Units, Spring 2011, 27 Students.
35. AE-732 Introduction to Flight Test Engineering- 3 Units, Spring 2011, 8 Students.

SERVICE RECORD (2009-Present)

Polar Expeditions

Led KU Unmanned Aerial Systems (UASs) flight test team in following polar expeditions:

1. **Greenland, Helheim**, June 2019.
2. **Greenland, Kangerlussuaq**, March 06th 2016-April 25th 2016.
3. **Greenland, Kangerlussuaq**, September 2015.
4. **Antarctica, Sub-glacial Lake Whillans (SLW) camp**, December 01st, 2013 through January 14th, 2014.
5. **Antarctica, McMurdo**, November 27th, 2011 through December 30th, 2011.
6. **Greenland, North Greenland Eemian (NEEM) camp**, June 1st 2011 through July 1st 2011. 2015.
7. **Antarctica, McMurdo**, November 28th, 2009 through January 12th, 2010.

University of Kansas Service

School of Engineering:

- Liaison of Aerospace Department in the Mathematics Committee in the School of Engineering, 2009- Present.
- Liaison of Aerospace Department in the Academic Standards Committee in the School of Engineering, 2016- Present.
- Liaison of Aerospace Department in the Curriculum Committee in the School of Engineering, 2010- 2016.
- Faculty judge in the Madison & Lila Self undergraduate Fellowship Program 2012- Present.
- Led the 2012 Sharp Professorship Selection Committee.
- School of Engineering Faculty Marshal for the University Commencement ceremony, 2011.

- Member of School of Engineering Research Facilities Design and Use (RFDU) Committee 2011.
- Serving as the Research Mentor of EECS Students in their Senior Projects 2009-12.
- Faculty adviser in the Madison & Lila Self undergraduate Fellowship Program 2010-12.

University:

- Faculty Adviser of **UAV** club
- Faculty Adviser of **Rover** club
- Faculty Adviser of **Taekwondo** club.

Departmental:

- Member of Undergraduate Committee, 2015- Present.
- Member of Award Committee, 2013- Present.
- Member of New Faculty Selection Committee, 2013.
- Member of Avionic Technician Selection Committee, 2013.
- Designer of Flight Dynamic and Control Doctoral Qualifying Exam, 2008- Present.
- Giving tours to potential students and their families.

National Professional Service

- Served as a panelist in the NSF Cyber Physical Systems, Unmanned Systems review process, 2018.
- Chair of Control Architectures Session in the 2018 International Conference of Unmanned Aerial Systems, Dallas Texas.
- Chair of Flight Testing Unmanned Aircraft Systems Session in the AIAA Aviation 2018, Atlanta, Georgia.
- Served as a panelist in the DOD's Science, Mathematics and Research for Transformation (SMART) Scholarship review, 2015 and 2017.
- Chair of Mechanical Engineering Sessions in the 123rd ASEE Annual Conference & Exposition in New Orleans, 2016.
- National President of Sigma Gamma Tau which is the American honor society in Aerospace Engineering 2012-15.
- National Vice President of Sigma Gamma Tau which is the American honor society in Aerospace Engineering 2009-12.
- Serve as a peer reviewer for
 - Wiley Journal of Nonlinear and Robust Control
 - AIAA Journal of Aircraft
 - Journal of Aircraft Engineering and Aerospace Technology
 - ASEE
 - IEEE Conference on Decision and Control
 - Journal of Aerospace Engineering