

**CURRICULUM VITAE**  
James Sean Humbert, Ph.D.

Notarization. I have read the following and certify that this curriculum vitae is a current and accurate statement of my professional record.

Date: 1/28/23

1. Personal Information

- a. **Name:** James Sean Humbert
- b. **Department:** Mechanical Engineering
- c. **Current Rank:** Professor
- d. **Year of Appointment:** 2015

e. **Education:**

- 2005 **Ph.D.** California Institute of Technology  
*Advisors:* Richard M. Murray, Michael H. Dickinson  
*Major field:* Mechanical Engineering  
*Dissertation:* “Bio-Inspired Visuomotor Convergence in Navigation and Flight Control Systems”
  
- 1999 **M.S.** California Institute of Technology  
Department of Mechanical Engineering
  
- 1997 **B.S.** University of California, Davis  
Department of Mechanical Engineering, *Magna Cum Laude*

f. **Employment/Research Experience**

- 6/18 – Present *Professor, Department of Mechanical Engineering*  
*Faculty Director for Aerospace and Defense (6/18-6/19)*  
*Associate Chair, Mechanical Engineering (9/19-Present)*  
*Denver Business Challenge Professor (8/19-Present)*  
**University of Colorado, Boulder**

**Fields of Study:** Autonomy, control theory, bio-inspired robotics, reduction principles in biology, flight dynamics and control of insects and Unmanned Aircraft Systems (UAS), dynamics and control of flexible/soft systems

- 8/15 – 6/18 *Associate Professor, Department of Mechanical Engineering, McLagan Family Faculty Fellow*  
**University of Colorado, Boulder**

- 1/14 – 8/15 *Techno-Sciences Associate Professor of Aerospace Engineering Innovation, Department of Aerospace Engineering*  
**University of Maryland, College Park**
- 9/12 – 4/13 *Visiting Associate, Department of Mechanical Engineering*  
**Stanford University**
- 3/11 – 8/15 *Associate Professor, Department of Aerospace Engineering*  
**University of Maryland, College Park**
- 8/05 – 3/11 *Assistant Professor, Department of Aerospace Engineering*  
**University of Maryland, College Park**  
4/10 – *Affiliate Faculty, Institute for Systems Research (ISR)*  
7/07 – *Affiliate Faculty, Department of Bioengineering*
- 6/05 – 8/05 *Postdoctoral Scholar, Prof. Richard M. Murray, California Institute of Technology*
- 1/02 – 6/05 *Graduate Research Assistant, Prof. Richard M. Murray, California Institute of Technology*
- 9/01 – 1/02 *Graduate Teaching Assistant, California Institute of Technology*
- 6/00 – 9/01 *Program Manager, Space and Strategic Programs, Pratt & Whitney Space Propulsion*
- 6/99 – 6/00 *Senior Design Engineer, Pratt & Whitney Space Propulsion*
- 6/98 – 9/98 *Visiting Researcher, United Technologies Research Center*
- 6/97 – 6/99 *Graduate Research Assistant, Prof. Richard M. Murray, California Institute of Technology*
- 6/95 – 6/97 *Undergraduate Research Assistant, Prof. Art Krener, Mathematics Department, University of California, Davis*

2. Research, Scholarly, and Creative Activities\*

**Publication list:** [http://scholar.google.com/citations?user=tgXkh\\_UAAAAJ](http://scholar.google.com/citations?user=tgXkh_UAAAAJ)

- a. Books
- i. Books authored
  - ii. Books edited

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\* Names in boldface indicate students under J. Sean Humbert's direct supervision.

iii. Chapters in books

1. Humbert JS, **Conroy JK**, Neely C, and Barrows G, “Wide-Field Integration Methods for Visuomotor Control,” in *Flying Insects and Robots*, Springer Verlag, 2009, DOI: 10.1007/978-3-540-89393-6\_5.
2. Humbert JS, **Hyslop AM**, “HS Tangential Cell Analogues and Implications for Efficient Visuomotor Control,” in *Frontiers in Sensing – Biology and Engineering*, Springer Verlag, 2011, ISBN: 978-3-211-99748-2.
3. Krapp HG, Taylor GK, and Humbert JS, “The Natural Mode-Sensing Hypothesis: Matching Sensors, Actuators, and Flight Dynamics,” in *Frontiers in Sensing – Biology and Engineering*, Springer Verlag, 2011, ISBN: 978-3-211-99748-2.
4. **Dean WA, Ranganathan BN**, Penskiy I, Bergbreiter S and Humbert JS, “Robust Gust Rejection on a Micro-Air Vehicle Using Bio-Inspired Sensing,” in *Mechatronics and Robotics Engineering for Advanced and Intelligent Manufacturing*, Springer Verlag, 2018, ISBN: 978-3319335803.

b. Articles in Refereed Journals\*

1. Humbert JS and Krener AJ, “Dynamics and Control of Entrained Solutions in Multi-Mode Moore-Greitzer Compressor Models,” *International Journal of Control*, Vol. 71, No. 5, pp. 807-821, 1998, DOI: 10.1080/002071798221588.
2. **Conroy JK, Gremillion G, Raganathan BN**, Humbert JS, “Implementation of Wide-Field Integration of Optic Flow for Autonomous Quadrotor Navigation,” *Autonomous Robots*, Vol. 27, No. 3, pp.189-198, 2009, DOI: 10.1007/s10514-009-9140-0.
3. Grauer J, **Conroy JK**, Hubbard JE Jr, and Humbert JS, “System Identification of a Miniature Helicopter,” *AIAA Journal of Aircraft*, Vol. 46, No. 4, pp. 1260-1269, 2009, DOI: 10.2514/1.40561.
4. Humbert JS and **Hyslop AM**, “Bio-Inspired Visuomotor Convergence,” *IEEE Transactions on Robotics*, Vol. 26, No. 1, pp. 121-130, 2010, DOI: 10.1109/TRO.2009.2033330.

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\* Names in boldface indicate students under J. Sean Humbert’s direct supervision.

5. **Hyslop AM** and Humbert JS, "Autonomous Navigation in 3-D Urban Environments Using Wide-Field Integration of Optic Flow," *AIAA Journal of Guidance, Control, and Dynamics*, Vol. 33, No. 1, pp.147-159, 2010, DOI: 10.2514/1.43778.
6. Roget B, Sitaraman J, Harmon R, Grauer J, Hubbard JE, Humbert JS, "Computational Study of Flexible Wing Ornithopter Flight," *AIAA Journal of Aircraft*, Vol. 46, No. 6, pp. 2016-2031, 2010, DOI: 10.2514/1.43187.
7. **Faruque I** and Humbert JS, "Dipteran Insect Flight Dynamics: Part 1: Longitudinal Motions about Hover," *Journal of Theoretical Biology*, Vol. 264, No. 2, pp. 538-552, 2010, DOI: 10.1016/j.jtbi.2010.02.018.
8. Ulrich ER, Pines DJ, and Humbert JS, "Pitch and Heave Control of Robotic Samara Micro Air Vehicles," *AIAA J. of Aircraft*, Vol. 47, No. 4, pp. 1290-1299, 2010, DOI: 10.2514/1.47197.
9. **Faruque I** and Humbert JS, "Dipteran Insect Flight Dynamics: Part 2: Lateral-Directional Motions About Hover," *Journal of Theoretical Biology*, Vol. 265, No. 3, pp. 306-313, 2010, DOI: 10.1016/j.jtbi.2010.05.003.
10. **Hyslop AM**, Krapp HG and Humbert JS, "Control Theoretic Interpretation of Directional Motion Preferences in Optic Flow Processing Interneurons," *Biological Cybernetics*, Vol. 103, pp. 339-352, 2010, DOI: 10.1007/s00422-010-0404-8.
11. Ulrich ER, Humbert JS, and Pines DJ, "From Falling to Flying: The Path to Powered Flight of a Robotic Samara Nano Air Vehicle," *Bioinspiration and Biomimetics*, Vol. 5, No. 4, 2010. DOI: 10.1088/1748-3182/5/4/045007.
12. Ulrich ER, **Faruque I**, Grauer J, Pines DJ, Humbert JS, and Hubbard JE, "Control Model for Robotic Samara: Dynamics about a Coordinated helical Turn," *AIAA J. Aircraft*, Vol. 33, No. 6, pp. 1921-1927, 2010, DOI: 10.2514/1.50878.
13. **Conroy JK**, Humbert JS, and Pines DJ, "System Identification of a Rotary Wing Micro Air Vehicle," *Journal of the American Helicopter Society*, Vol. 56, No. 2, 2011.
14. Humbert JS and **Faruque I**, "Analysis of Insect-Inspired Wingstroke Kinematic Perturbations for Longitudinal Control," *AIAA J. of Guidance, Control and Dynamics*, Vol. 34, No. 2, pp. 618-623, 2011, DOI: 10.2514/1.51912.

15. Grauer J, Ulrich E, Hubbard JE, Pines DJ, Humbert JS, “Testing and System Identification of an Ornithopter in Longitudinal Flight,” *AIAA Journal of Aircraft*, Vol. 48, No. 2, pp. 660-667, 2011, DOI: 10.2514/1.54008.
16. Xu P, Humbert JS, Abshire P, “Analog VLSI Implementation of Wide-Field Integration Methods,” *Journal of Intelligent and Robotic Systems*, Vol. 64, No. 3, pp. 465-487, 2011, DOI: 10.1007/s10846-011-9549-5.
17. Shoemaker PA, **Hyslop AM** and Humbert JS, “Optic Flow Estimation on Trajectories Inspired by Closed-Loop Flight,” *Biological Cybernetics*, Vol. 104, No. 4, pp. 339-350, 2011, DOI:10.1007/s00422-011-0436-8.
18. **Vance JT, Faruque I,** and Humbert JS, “Kinematic Strategies for Mitigating Gust Perturbations in Insects,” *Bioinspiration and Biomimetics*, Vol. 8, No. 1, 2013, DOI: 10.1088/1748-3182/8/1/016004.
19. **Dimble KD, Faddy JM** and Humbert JS, “Extraction of Relative Proximity from Electrostatic Images Using Wide-Field Integration Methods,” *Bioinspiration and Biomimetics*, Vol. 9, No. 1, 2014, DOI: 10.1088/1748-3182/9/1/016012.
20. **Keshavan J, Gremillion G, Escobar-Alvarez H** and Humbert JS, “A  $\mu$ -analysis Based Controller Synthesis Framework for Robust Visual Navigation in Less-Structured Environments,” *Bioinspiration and Biomimetics*, Vol. 9, No. 2, 2014, DOI:10.1088/1748-3182/9/2/025011.
21. Hrishikeshavan V, Humbert JS and Chopra I, “Controllability and Disturbance Gramian Analysis of a Shrouded Rotor Micro Air Vehicle,” *AIAA Journal of Guidance, Control and Dynamics*, Vol. 37, No. 5, pp. 1684-1691, 2014, DOI: 10.2514/1.G000066.
22. **Keshavan J** and Humbert JS, “A H-infinity Loopshaping Framework for Bio-Inspired Reflexive Visual Navigation in 3D Urban Environments,” *Journal of Robotics and Autonomous Systems*, Vol. 62, No. 8, pp. 1085-1097, 2014, DOI: 10.1016/j.robot.2014.05.005.
23. **Gardner RC** and Humbert JS, “Comparative Framework for Maneuverability and Gust Tolerance of Micro Helicopters,” *AIAA Journal of Aircraft*, Vol. 51, No. 5, pp. 1546-1553, 2014, DOI: 10.2514/1.C032406.

24. **Faruque IA** and Humbert JS, “Wing Motion Transformation to Evaluate Aerodynamic Coupling in Flapping Wing Flight,” *Journal of Theoretical Biology*, Vol. 363, pp. 198-204, 2014, DOI: 10.1016/j.jtbi.2014.07.026.
25. **MacFarlane K, Faruque IA** and Humbert JS, “Power Regulation of Kinematic Control Inputs for Forward Flying Drosophila,” *Acta Mechanica Sinica*, Vol. 30, No. 6, pp. 809-818, 2014, DOI:10.1007/s10409-014-0094-x.
26. **Gremillion G, Krapp HG** and Humbert JS, “Bio-Inspired Modeling and Implementation of the Ocelli Visual System of Flying Insects,” *Biological Cybernetics*, Vol. 108, No. 6, pp. 735-746, 2014, DOI: 10.1007/s00422-014-0610-x.
27. **Keshavan J, Gremillion G, Escobar-Alvarez H** and Humbert JS, “Autonomous Vision-Based Navigation of a Quadrotor in Corridor-Like Environments,” *International Journal of Micro Air Vehicles*, Vol. 7, No. 2, pp. 111-124, 2015. DOI: 10.1260/1756-8293.7.2.111.
28. **Keshavan J, Escobar-Alvarez H** and Humbert JS, “An Adaptive Observer Framework for Accurate Feature Depth Estimation Using an Uncalibrated Monocular Camera,” *Journal of Control Engineering Practice*, Vol. 46, pp. 59-65, 2016, DOI: 10.1016/j.conengprac.2015.10.005.
29. **Gremillion G** and Humbert JS, “Disturbance Rejection with Distributed Acceleration Sensing for Small Unmanned Aircraft Systems,” *AIAA Journal*, Vol. 54, No. 8, pp. 2233-2246, 2016, DOI: 10.2514/1.J054408.
30. **Keshavan J, Escobar-Alvarez H, Dimble KD, Humbert JS, Goerzen, CL** and Whalley MS, “Application of a Nonlinear Recursive Observer for Accurate Visual Depth Estimation from UH-60 Flight Data,” *AIAA J. of Guidance, Control and Dynamics*, Vol. 39, No. 7, pp. 1501-1512, 2016, DOI: 10.2514/1.G001450.
31. **Dimble KD, Ranganathan, BN, Humbert JS** and **Keshavan, J**, “Robust Analysis of an Underwater Navigational Strategy in Electrically Heterogeneous Corridors,” *Bioinspiration and Biomimetics*, Vol. 11, No. 4, 2016, DOI: 10.1088/1748-3190/11/4/045004.

32. **Keshavan J** and Humbert JS, “An Optical Flow-Based Solution to the Problem of Range Identification in Perspective Vision Systems,” *Journal of Intelligent and Robotic Systems*, Vol. 85, No: 3-4, pp. 651-662, 2016, DOI: 10.1007/s10846-016-0404-6.
33. **Keshavan J** and Humbert JS, “An Analytically Stable Structure and Motion Observer Based On Monocular Vision,” *Journal of Intelligent and Robotic Systems*, Vol. 86, No. 3-4, pp. 495-510, 2017, DOI: 10.1007/s10846-017-0470-4.
34. **Keshavan J** and Humbert JS, “Robust Structure and Motion Recovery for Monocular Vision Systems with Noisy Measurements,” *International Journal of Control*, 2017 DOI:10.1080/00207179.2017.1291997.
35. **Keshavan J** and Humbert JS, “Structure-Independent Motion Recovery from a Monocular Image Sequence with Low Fill Fraction”, *International Journal of Robust and Nonlinear Control*, 2017, DOI:10.1002/rnc.3879.
36. **Faruque IA**, Muijres FT, **Macfarlane K**, **Kehlenbeck A**, Humbert JS, “Identification of Optimal Feedback Control Rules from Micro-Quadrotor and Insect Flight Trajectories,” *Biological Cybernetics*, Vol. 112, No. 3, pp. 165-179, 2018. DOI: 10.1007/s00422-017-0742-x.
37. **Mwaffo V**, **Keshavan J**, Hedric T and Humbert JS, “Detecting Switching and Intermittent Leadership in Networks of Coupled Dynamical Systems,” *Scientific Reports*, Vol. 8, No. 1, 2018. DOI: 10.1038/s41598-018-28285-1.
38. **Escobar-Alvarez HD**, **Ohradzansky M**, **Keshavan J**, **Ranganathan BN** and Humbert JS, “Bio-Inspired Approaches for Autonomous Small Object Perception and Avoidance,” *IEEE Transactions on Robotics*, Vol. 35, No. 5, 2019. DOI:10.1109/TRO.2019.2922472.
39. **Castano LM**, **Gremillion GM**, Winklemann AE and Humbert JS, “Disturbance Rejection for an Unmanned Rotary Aircraft System Using Strain Sensing,” *AIAA J. of Guidance, Control and Dynamics*, Vol. 42, No. 12, pp. 2638-2649, 2019, DOI: 10.2514/1.G004104.
40. Johnson B, Sundaram V, **Naris M**, Acome E, Ly KD, Correll N, Keplinger C, Humbert JS and Rentschler M, “Identification and Control of a Nonlinear Soft Actuator and Sensor System,” *IEEE Robotics and Automation Letters*, Vol. 5, No. 3, pp. 3783-3790, 2020, DOI: 10.1109/LRA.2020.2982056.

41. Ly K, Kellaris N, McMorris D, Johnson BK, Acome E, Sundaram V, Naris M, Humbert, JS, Rentschler ME, Correll N, “Miniaturized Circuitry for Capacitive Self-Sensing and Closed Loop Control of Soft Electrostatic Transducers,” *Soft Robotics*, 2020, DOI: 10.1089/SORO.2020.0048.
42. Formosa G, Prendergast JM, Humbert JS and Rentschler ME, “Nonlinear Dynamic Modeling of a Robotic Endoscopy Platform on Synthetic Tissue Substrates,” *Journal of Dynamic Systems, Measurement and Control*, Vol. 143, No. 1, 2021, DOI: 10.1115/1.4048190.
43. Mwaffo V, De Lellis P and Humbert JS, “Formation Control of Stochastic Multi-Vehicle Systems,” *IEEE Transactions on Robotics*, Vol. 29, No. 6, pp. 2505-2516, 2021. DOI: 10.1109/TCST.2020.3047422.
44. **Ahmad S**, Sunberg ZN and Humbert JS, “End-to-End Probabilistic Depth Perception and 3D Obstacle Avoidance using POMDP,” *Journal of Intelligent & Robotic Systems*, Vol. 103, No. 2, 2021. DOI: 10.1007/s10846-021-01489-w.
45. Shin HS, **Ott Z**, **Beuken LG**, **Ranganathan BN**, Humbert JS and Bergbreiter S, “Bio-Inspired Large-Area Soft Sensing Skins to Measure UAV Wing Deformation in Flight,” *Advanced Functional Materials*, Vol. 31, No. 23, 2021. DOI: 10.1002/adfm.202100679.
46. **Ohradzansky MT** and Humbert, JS, “Lidar-Based Navigation of Subterranean Environments Using Bio-Inspired Wide-Field Integration of Nearness,” *Sensors*, Vol. 22, No. 3, 2022. DOI: 10.3390/s22030849.
47. Sundaram V, Ly K, Johnson BK, **Naris M**, Anderson MP, Humbert JS, Correll N, Rentschler M, "Embedded Magnetic Sensing for Feedback Control of Soft HASEL Actuators," *IEEE Transactions on Robotics*, 2022, DOI: 10.1109/TRO.2022.3200164.
48. **Ohradzansky M**, **Rush E**, Riley D, Mills A, **Ahmad S**, McGuire S, Biggie H, Harlow K, Miles M, Frew E, Heckman C and Humbert, JS, “Multi-Agent Autonomy: Advancements and Challenges in Subterranean Exploration.” *Field Robotics*. Vol. 2., pp. 1068-1104, 2022. DOI:10.55417/fr.2022035.



Articles Accepted to Refereed Journals: \*

49. Biggie H, **Rush E**, Riley DG, **Ahmad S**, **Ohradzansky MT**, Harlow K, Miles MJ, Torres D, McGuire S, Frew EW, Heckman C and Humbert JS, “Flexible Supervised Autonomy for Exploration in Subterranean Environments,” accepted to *Field Robotics*, 2023

Reviewed and under Minor Revision:

50. **MacFarlane K** and Humbert JS, “Longitudinal Control Strategies for Dipteran Flight,” *submitted to Journal of Theoretical Biology*.

Articles Submitted to Refereed Journals:

51. **MacFarlane K** and Humbert JS, “Gramian-Based Comparative Analysis of Micro Air Vehicle Platforms,” *submitted to International Journal of Micro Air Vehicles*.

- c. Monographs, Reports, and Extension Publications
- d. Book Reviews, Other Articles and Notes
- e. Invited Talks, Abstracts, and Other Professional Papers Presented
  - i. Invited Talks
    - 1. Humbert JS, “Sensorimotor Convergence in Visual Navigation and Flight Control Systems,” *Applied Math Seminar Series*, UC Davis, November 2004.
    - 2. Humbert JS, “Bio-Inspired Visuomotor Convergence with Applications to Autonomous Flight Control and Navigation,” *Center for Integrated Multiscale Modeling and Simulation (CIMMS) Seminar Series*, Caltech, January 2005.
    - 3. Humbert JS, “Extracting Behaviorally Relevant Visual Motion Cues via Wide-Field Integration,” *NIA Seminar Series*, National Institute of Aerospace, Hampton, VA 2005.

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\* Names in boldface indicate students under J. Sean Humbert’s direct supervision.

4. Humbert JS, "Extracting Behaviorally Relevant Visual Motion Cues via Wide-Field Integration," *Mechanical Engineering Seminar Series, University of California, Santa Barbara*, 2006.
5. Humbert JS, "Visuomotor Convergence in Insects: Applications for Autonomous MAV/UAV Guidance, Navigation, and Control," *University of Washington*, January 2007.
6. Humbert JS, "Implementing Models of Flying Biological Systems in Microvehicles," *TTCP JSA Symposium on the Science of Autonomy and Bio-Inspiration, Army Research Laboratory*, October 2007.
7. Humbert JS, "Fundamental Principles of Sensorimotor Convergence in Biological Systems (Plenary Speaker)," *NSF Workshop on Bio-Sensing and Bio-Actuation, University of Maryland*, November 2007.
8. Humbert JS, "Visuomotor Convergence in Insects: Applications for Autonomous MAV/UAV Guidance, Navigation, and Control," *George Washington University*, February 2008.
9. Humbert JS, "Bio-Inspired Visuomotor Convergence," *ICRA Biorobotics Workshop, Pasadena, CA*, May 2008.
10. Humbert JS, "Visuomotor Convergence in Natural Systems and Applications for Autonomous Microsystems," *University of the Mediterranean – Franceschini Lab*, September 2008.
11. Humbert JS, "Insect Sensing and Flight Control: Applications for Autonomous Microsystems," *Biology Seminar Series, Bowling Green State University*, December 2008.
12. Humbert JS, "Insect Inspired Flight Mechanisms," *AFRL/DSTL Joint Workshop on Micro Air Vehicles, Chilworth, Southampton, UK*, December 2008.
13. Humbert JS, "Visuomotor Convergence in Natural Systems with Applications to Microsystems," *Bioengineering Seminar, Imperial College, UK*, September 2009.
14. Humbert JS, "Flight Dynamics and Control in Dipteran Insects: Applications for Aerial Microsystems," *Aerospace and Ocean Engineering Seminar, Virginia Tech*, October 2009.

15. Humbert JS, "Flight Dynamics and Control in Dipteran Insects with Applications for Aerial Microsystems," *Johns Hopkins University*, April 2010.
16. Humbert JS, "Flight Dynamics and Gust Response in Insects," *Workshop on Bio-Inspired Guidance, Navigation, and Control, Air Force Research Laboratory (Munitions - Eglin)*, April 2010.
17. Humbert JS, "Sensorimotor Control Modeling for Insect Flight," *ONR / AFOSR Workshop on Bio-Inspired Autonomous Systems*, May 2010.
18. Humbert JS, "Flight Dynamics and Control of Dipteran Insects with Applications to Aerial Microrobotics," *American Control Conference – Special Topics Session*, Baltimore, MD, June 2010.
19. Humbert JS, "Insect Flight Path Control," *State of the Art Review (SOAR), Air Force Research Laboratory Workshop*, Atlanta, GA, June 2010.
20. Humbert JS, "GNC Challenges for Aerial Microrobotics," *Robotics and Embedded Systems Seminar, University of California, Berkeley*, September 2010.
21. Humbert JS, "Flight Dynamics and Control of Flapping Wing Microsystems," *Fluid Dynamics Seminar, Brown University*, October 2010.
22. Humbert JS, "Guidance, Navigation and Control Challenges of Aerial Microrobotics," *University of Washington*, October 2010.
23. Humbert JS, "Distributed Sensing, Feedback, and Control Architectures in Biological Systems," (Keynote Speaker) *NSF/NSFC Workshop on Advanced Sensors and Bio-Inspired Technologies, Shanghai, China*, November 2010.
24. Humbert JS, "Flight Mechanics and Control Challenges in Aerial Microrobotics," (Keynote Speaker) *AHS Specialists Meeting on Unmanned Rotorcraft and Network Centric Operations, Tempe, AZ*, January 2011.
25. Humbert JS, "Flight Dynamics and Control Challenges of Microbotic Systems," *Aerospace Engineering Seminar, University of Michigan*, February 2011.

26. Humbert JS, "Flight Dynamics and Control Challenges of Microrobotic Systems," *Joint Control and Fluids Seminar Series, UCLA*, April 2011.
27. Humbert JS, "Flight Dynamics and Control Challenges of Microrobotic Systems," *ONR Microflyer Workshop*, May 2011.
28. Humbert JS, "Sensorimotor Control Modeling of Insect Flight," *ONR/AFOSR Meeting on Bio-Inspired Autonomous Systems*, May 2011.
29. Humbert JS, "Simultaneous Optimization of Sensing and Actuation in Microsystems," *AFRL/DSTL State of the Art Review (SOAR)*, Southampton, UK, July 2011.
30. Humbert JS, "Principles of Sensorimotor Control at Insect Scale," *New Trends in Aerospace Seminar Series, MIT*, November 2011.
31. Humbert JS, "Principles of Sensorimotor Control at Insect Scales," *MAE Department Seminar Series, UCLA*, February 2012.
32. Humbert JS, "Principles of Sensorimotor Integration at Insect Scales," *Department of Aeronautics and Astronautics Seminar Series, University of Washington*, April 2012.
33. Humbert JS, "Principles of Sensorimotor Integration at Insect Scales," *Robotics and Intelligent Machines (RIM) Seminar Series, Georgia Tech*, October 2012.
34. Humbert JS, "Sensorimotor Integration and Control at Insect Scales," *Naval Postgraduate School Applied Mathematics Seminar*, January 2013.
35. Humbert JS, "Sensorimotor Integration and Control at Insect Scales," *CiBER-IGERT Seminar Series, UC Berkeley*, February 2013.
36. Humbert JS, "Sensorimotor Integration and Control at Insect Scales," *Caltech Control and Dynamical Systems Seminar*, April 2013.
37. Humbert JS, "Sensorimotor Integration and Control at Insect Scales," *Aero/Astro Seminar Series, Stanford University*, May 2013.
38. Humbert JS, "The Mode Sensing Hypothesis," *BIOUAS, Imperial College London*, July 2013

39. Humbert JS, "Insect Inspired Perception and Sensorimotor Control for Autonomous Flight," *Howard Community College, National Engineer's Week*, February 2014.
40. Humbert JS, "Sensorimotor Integration and Control in Small Organisms," *CU Boulder Department of Mechanical Engineering*, April 2015
41. Humbert JS, "Sensorimotor Integration and Control in Small Organisms," *Aurora Flight Sciences*, September 2015
42. Humbert JS, "Nature's Smallest Flyers Provide Deep Insights for Autonomous Flight," *Exxon Mobile Research Club*, April 2018.
43. Humbert JS, "Biological Sensorimotor Convergence: Opportunities to Enhance Future Engineered Systems," *National Centre for Biological Sciences*, Bangalore, India, June 2019
44. Humbert JS, "AI in Subterranean Exploration: Future Directions," *Artificial Intelligence for Good Global Summit on "Robotic Exploration of Subterranean Worlds,"* by the International Telecommunication Union (ITU), January 2022

ii. Refereed Conference Proceedings \*

1. Humbert JS and Krener AJ, "Analysis of Higher Order Moore-Greitzer Compressor Models," *IEEE Conference on Control Applications*, pp. 651 – 656, Hartford, CT, 1997. DOI: 10.1109/CCA.1997.627733.
2. Pichon T, Lacombe A, Joyez P, Ellis R, Humbert JS, and Payne, FM, "RL10B-2 Nozzle Extension Assembly Improvements for Delta IV," *52<sup>nd</sup> International Astronautical Congress*, Toulouse, France, 2001.
3. Lacombe A, Pichon T, Ferrey M, Ellis R, Humbert JS, and Payne FM, "Ground Qualification of an Improved C-C Deployable Nozzle Extension Assembly for Delta IV," *38<sup>th</sup> AIAA Joint Propulsion Conference*, AIAA 2002-3585, Indianapolis, IN, 2002.

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\* Names in boldface indicate students under J. Sean Humbert's direct supervision.

4. Indermuehle KC, Brillhart R, Moehrle FX, and Humbert JS, "Determination of Environment for Component Testing Using Test and Analysis," *IMAC-XXI*, Kissimmee, FL, 2003.
5. Reiser MB, Humbert JS, Dunlop MJ, Del Vecchio D, Murray RM, and Dickinson MH, "Vision as a Compensatory Mechanism for Disturbance Rejection in Upwind Flight," *American Control Conference*, pp. 311-316, Boston, MA, 2004. **Winner of best student paper competition.**
6. Humbert JS, Murray RM, and Dickinson MH, "Sensorimotor Convergence in Visual Navigation and Flight Control Systems," *16<sup>TH</sup> IFAC World Congress*, Prague, 2005.
7. Humbert JS, Murray RM, and Dickinson MH, "Pitch-Altitude Control and Terrain Following Based on Bio-Inspired Visuomotor Convergence," *AIAA Conference on Guidance, Navigation and Control*, AIAA 2005-6280, San Francisco, CA, 2005. **Winner of best paper award.**
8. Humbert JS, Murray RM, and Dickinson MH, "A Control-Oriented Analysis of Bio-Inspired Visuomotor Convergence," *44<sup>th</sup> IEEE Conference on Decision and Control*, pp. 245-250, Seville, Spain, 2005.
9. Humbert JS and Frye MA, "Extracting Behaviorally Relevant Retinal Image Motion Cues via Wide-Field Integration," *American Control Conference*, pp. 2724-2729, Minneapolis, MN, 2006. DOI: 10.1109/ACC.2006.1656635.
10. Humbert JS, **Hyslop AM**, and **Chinn M**, "Experimental Validation of Wide-Field Integration Methods for Autonomous Navigation," *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, San Diego, CA, 2007.
11. Roget B, Sitaraman J, Harmon R, Grauer J, **Conroy JK**, Hubbard JE Jr, Humbert JS, "A Computational Study of Flexible Wing Ornithopter Flight," *AIAA Applied Aerodynamics Conference*, AIAA-2008-6397, Honolulu, Hawaii, 2008.
12. Harmon R, Grauer J, Hubbard J, and Humbert JS, "Experimental Determination of Ornithopter Membrane Wing Shapes used for Simple Aerodynamic Modeling," *AIAA Atmospheric Flight Mechanics Conference*, AIAA-2008-6237, Honolulu, Hawaii, 2008.

13. Grauer J, **Conroy JK**, Hubbard JE Jr, and Humbert JS, "System Identification of a Miniature Helicopter," *AIAA Atmospheric Flight Mechanics Conference*, AIAA-2008-6898, Honolulu, Hawaii, 2008.
14. **Hyslop AM** and Humbert JS, "Wide-Field Integration Methods for Autonomous Navigation in 3-D Environments," *AIAA Conference on Guidance, Navigation, and Control*, Paper AIAA 2008-7252, Honolulu, HI, 2008.
15. Grauer J, **Conroy JK**, Hubbard JE Jr, Humbert JS, and Pines DJ, "Field Calibration of Inertial Measurement Units for Miniature Unmanned Aircraft," *AIAA Infotech at Aerospace Conference*, AIAA-2009-2064, Seattle, WA, 2009.
16. **Keshavan J** and Humbert JS, "MAV Stability Augmentation Using Outputs from Hair Sensor Arrays," *American Control Conference*, Baltimore, MD, 2010. **Winner of best paper in session award.**
17. **Dimble KD, Faddy JM** and Humbert JS, "Extraction of Relative Proximity from Electrostatic Images Using Wide-Field Integration Methods," *American Control Conference*, Baltimore, MD, 2010. **Winner of best paper in session award.**
18. Ulrich E, **Faruque I**, Pines DJ, Humbert JS, "Control Model for Robotic Samara: Dynamics about a Coordinated Helical Turn," *American Controls Conference*, Baltimore, MD, 2010, *invited paper. Winner of best paper in session award.*
19. Grauer J, Ulrich E, Hubbard JE, Pines DJ, and Humbert JS, "System Identification of an Ornithopter Aerodynamics Model," *AIAA Conference on Guidance, Navigation, and Control*, AIAA-2010-7632, Toronto, Canada, 2010.
20. **Gerardi S**, Ulrich E, Humbert JS and Pines DJ, "Hover Stabilization of a Controllable Mechanical Samara," *AIAA Conference on Atmospheric Flight Mechanics*, AIAA-2010-7873, Toronto, Canada, 2010.
21. Grauer J, Ulrich E, Hubbard JE, Pines DJ, and Humbert JS, "Identification of a Robotic Samara Aerodynamic/Multi-Body Dynamic Model," *AIAA Conference on Guidance, Navigation, and Control*, AIAA-2010-8233, Toronto, Canada, 2010.
22. **Gremillion G** and Humbert JS, "System Identification of a Quadrotor Micro Air Vehicle," *AIAA Conference on Atmospheric Flight Mechanics*, AIAA-2010-7644, Toronto, Canada, 2010.

23. Zarovy S, Costello M, Mehta A, **Gremillion G**, **Miller DS**, **Ranganathan B**, Samuel PD, and Humbert JS, "Experimental Study of Gust Effects on Micro Air Vehicles," *AIAA Conference on Atmospheric Flight Mechanics*, AIAA-2010-7818, Toronto, Canada, 2010.
24. Grauer J, Ulrich E, Hubbard JE, Pines DJ, and Humbert JS, "Model Structure Determination of an Ornithopter Aerodynamics Model from Flight Data," *AIAA Aerospace Sciences Meeting*, AIAA-2010-41, Orlando, Florida, 2010.
25. Bush B, **Macfarlane M**, Baeder J and Humbert JS, "Development of Immersed Boundary Code with Applications to MAV Stability Analysis," *Army Science Conference*, November 2010.
26. Xu P, Abshire P, and Humbert JS, "Motion Image Sensor with On-chip Adaptation and Programmable Filtering," *International Conference on Circuits and Systems (ISCAS)*, Rio de Janeiro, Brazil, May 2011.
27. Pierce L, Humbert JS, **Gerardi S**, Sarabandi K, and Moallem M "Combined radar and Optical Flow Navigation for Flying Robots in Urban Areas," *International Symposium on Antennas and Propagation and UNSC/USRI National Radio Science Meeting*, July 2011.
28. **Macfarlane M**, Bush B, **Faruque I**, Humbert JS, and Baeder J, "Quasi-Steady and Computational Aerodynamics Applied to Hovering Drosophila Dynamics," *29<sup>th</sup> Applied Aerodynamics Conference*, Honolulu, Hawaii, June 2011.
29. **Gerardi S**, Humbert JS, Pierce L, and Sarabandi K, "Velocity Estimation Using Optic Flow and Radar," *SPIE Proceedings 8031*, Orlando, FL, June 2011.
30. **Faruque I** and Humbert JS, "Reduced Order Roll/Yaw Model for Dipteran Flapping Forward Flight," *AIAA Conference on Guidance, Navigation, and Control*, AIAA-2010-8233, Portland, OR, August 2011.
31. Vandenheede RBR, Bernal LP, Morrison CL and Humbert JS, "Force Generation of Bio-Inspired Hover Kinematics" *AIAA Aerospace Sciences Meeting*, Nashville, TN, January 2012.
32. Penskiy I, Samuel PD, Humbert JS and Bergbreiter S, "A Bio-inspired Active Tail Control Actuator for Nano Air Vehicles,"



*IEEE Conference on Robotics and Automation (ICRA)*, St. Paul, MN, May 2012.

33. **Keshavan J** and Humbert JS, "A H-infinity Controller Synthesis Framework for Vision-Based Obstacle Avoidance Applications," *ICME Conference on Complex Medical Engineering*, Kobe, Japan, July 2012.
34. **Faruque I, MacFarlane K** and Humbert JS, "Reduced Order Forward Flight Dynamics Models for Dipteran Insects," *AIAA Conference on Guidance, Navigation, and Control*, Minneapolis, MN, Aug 2012.
35. **Keshavan J** and Humbert JS, "A H-infinity Loopshaping Approach for Optic Flow Based Visual Navigation," *AIAA Conference on Guidance, Navigation, and Control*, Minneapolis, MN, Aug 2012.
36. **Gremillion G, Galfond M, Krapp HG** and Humbert JS, "Biomimetic Sensing and Modeling of the Ocelli Visual System of Flying Insects," *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, Villamoura, Portugal, Oct 2012.
37. **Keshavan J** and Humbert JS, "A H-infinity Loopshaping Approach for Autonomous Bio-Inspired Visual Navigation in Three-Dimensional Urban Environments," *IEEE Conference on Decision and Control*, Maui, Hi, Dec 2012.
38. **Gardner R, Humbert JS** and Chopra I, "Maneuverability Comparison of Flybar and Flybarless Micro-Helicopters," *AHS International Specialists' Meeting on Unmanned Rotorcraft and Network Centric Operations*, Scottsdale, AZ, Jan 2013.
39. **Hrishikeshavan V, Humbert JS** and Chopra I, "Controllability and Disturbance Gramian Analysis of a Shrouded Rotor Micro Air Vehicle in Hover," *AHS International Specialists' Meeting on Unmanned Rotorcraft and Network Centric Operations*, Scottsdale, AZ, Jan 2013.
40. **MacFarlane M** and Humbert JS, "Forward Flight Dynamics of an Insect-Inspired Flapping Wing Micro Air Vehicle," *AHS International Specialists' Meeting on Unmanned Rotorcraft and Network Centric Operations*, Scottsdale, AZ, Jan 2013.
41. **Ranganathan BN, Dimble KD, Faddy JM** and Humbert JS, "Underwater Navigation Behaviors Using Wide-Field Integration Methods," *IEEE International Conference on Robotics and Automation (ICRA)*, Karlsruhe, Germany, May 2013.

42. **Faruque IA**, Samuel PD and Humbert JS, “Yaw Dynamics Identification of an Insect-Inspired Flapping Wing Micro Air Vehicle,” *AIAA Guidance, Navigation, and Control at SciTech 2014*, National Harbor, MD, Jan 13-17, 2014.
43. **Faruque IA**, Samuel PD and Humbert JS, “Moment Generation of Stabilizing Axes for Insect-Inspired Flapping Wing Flight,” *AIAA Atmospheric Flight Mechanics Conference, AIAA Aviation and Aeronautics Forum and Exposition*, Atlanta, GA, June 2014.
44. **Castano L**, Humbert JS and McKenna T, “Gust Rejection Using Force Adaptive Feedback for Roll,” *AIAA Atmospheric Flight Mechanics Conference, AIAA Aviation and Aeronautics Forum and Exposition*, Atlanta, GA, June 2014.
45. **Conroy J, Kehlenbeck A**, and Humbert JS, “Characterization and Enhancement of Micro Brushless DC Motor Response,” *Proceedings of the SPIE Defense and Security, International Society for Optimal Engineering Conference*, Baltimore, MD, 2014.
46. **Gremillion G, Castano L** and Humbert JS, “Disturbance Rejection with Distributed Acceleration and Strain Sensing,” *AIAA Guidance, Navigation, and Control at SciTech*, Kissimmee, FL, Jan 5-9, 2015.
47. **Castano L**, Airoidi S, McKenna T and Humbert JS, “Wing Sensor Placement for Gust Disturbance Rejection,” *AIAA Guidance, Navigation, and Control at SciTech*, Kissimmee, FL, Jan 5-9, 2015. **Best paper in session**
48. **Ashkanazy JR** and Humbert JS, “Bio-Inspired Absolute Heading Sensing Based on Atmospheric Scattering,” *AIAA Guidance, Navigation, and Control at SciTech 2015*, Kissimmee, FL, Jan 5-9, 2015. **Best paper in session**
49. **Castano L**, Humbert JS and McKenna, T, “Gust Rejection Using Force Adaptive Feedback for Roll,” *AIAA Guidance, Navigation, and Control at SciTech*, Kissimmee, FL, Jan 5-9, 2015.
50. **MacFarlane K** and Humbert, JS, “Lagrangian Flow Structures Around a Flapping Wing,” *AIAA Atmospheric Flight Mechanics Conference at SciTech*, Kissimmee, FL, Jan 4-9, 2015.
51. **Dimble KD, Escobar-Alvarez HD, Ranganathan BN**, Conroy JK and Humbert JS, “3D Depth Estimation for Helicopter Landing Site Visualization in Environments with Degraded Visibility,” *6th AHS*

*International Specialists Meeting On Unmanned Rotorcraft Systems*, Chandler, AZ, January 2015.

52. Badrya C, **MacFarlane K**, Baeder J, Humbert JS, “Insect Kinematics in Trimmed Flight at Low Reynolds Numbers Using CFD” *53rd AIAA Aerospace Sciences Meeting, AIAA SciTech*, Orlando FL, January 2015.
53. **Gremillion G** and Humbert JS, “Bio-Inspired Sensing and Control for Disturbance Rejection and Stabilization,” *SPIE Defense, Security, and Sensing Conference Proceedings*, Baltimore, MD, April 2015. *Invited Paper*
54. **Dimble KD**, **Ranganathan BN**, **Keshavan J** and Humbert JS, “Computationally Efficient Underwater Navigational Strategy in Electrically Heterogeneous Environments using Electrolocation,” *IEEE International Conference on Robotics and Automation (ICRA)*, Seattle, WA, May 2015.
55. **Ranganathan BN**, Penskiy I, **Dean W**, Bergbreiter S and Humbert JS, “Bio-inspired Wind Frame State Sensing and Estimation for MAV Applications”, *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, Hamburg, Germany, Oct 2015.
56. **Dean W**, **Ranganathan BN**, Penskiy I, Bergbreiter S and Humbert JS, “Robust Gust Rejection on a Micro Air Vehicle Using Bioinspired Sensing”, *International Conference on Mechatronics and Robotics Engineering*, Nice, France, Feb 2016.
57. Shin HS, **Castano, LM**, Humbert JS and Bergbreiter, S, “Sensing Skin for Detecting Wing Deformation with Embedded Soft Strain Sensors,” *IEEE Sensors Conference*, Orlando, FL, Oct 2016
58. **Keshavan, J** and Humbert JS, “Range Identification Using an Uncalibrated Monocular Camera,” *American Control Conference*, Seattle, WA, May 2017
59. Hrishikeshavan V, Shrestha E, Chopra I and Humbert JS, “Controllability Analysis of a Quadrotor in Hover Using Empirical Gramians,” *AHS Specialists’ Meeting on Unmanned Rotorcraft Network Centric Operations*, Mesa, AZ, Jan 2017.
60. **Maio A**, **Ranganathan B**, Gremillion G, Nothwang W and Humbert JS, “Acceleration Feedback Control for Fixed-Wing sUAS,” *IEEE Aerospace Conference*, Big Sky, Montana, Mar 2018. DOI: 10.1109/AERO.2018.8396639.

61. **Keshavan J** and Humbert JS, “Partial Aircraft State Recovery from Visual Motion in Unstructured Environments,” *AIAA SciTech Guidance Navigation and Control Conference*, Florida, 2018.
62. **Ohradzansky M**, **Escobar-Alvarez H**, **Keshavan J** **Ranganathan BN** and Humbert JS, “Autonomous Bio-Inspired Small-Object Detection and Avoidance,” *IEEE International Conference on Robotics and Automation*, Brisbane, Australia, May 2018.
63. **Keshavan J** and Humbert JS, “Robust Motion Recovery from Noisy Stereoscopic Measurements,” *IEEE American Control Conference (ACC)*, Wisconsin, June 2018.
64. **Mwaffo V**, **Keshavan J**, Hedric T and Humbert JS, “A Data-Driven Method to Dissect the Dynamics of Causal Influence in Complex Dynamical Systems,” *IEEE Workshop on Complexity Engineering (COMPENG)*, Florence, Italy, 2018.
65. **Keshavan J** and J. S. Humbert, “Robust Motion Recovery from Noisy Stereoscopic Measurements,” *IEEE American Control Conference*, Milwaukee, WI, 2018.
66. **Ranquist EA**, Humbert JS and Argrow B, “Distributed Acceleration Sensing for Small UAS Wind Gust Estimation,” 99<sup>th</sup> *Annual American Meteorological Society Meeting*, Phoenix, AZ, January 2019.
67. Loefgren I, Ahmed N, Frew E, Heckman C, and Humbert JS, “Scalable Event-triggered Data Fusion for Autonomous Cooperative Swarm Localization,” *International Conference on Information Fusion (FUSION 2019)*, Ottawa, Canada, July 2019.
68. **Ohradzansky MT**, Mills AB, **Rush ER**, Riley DG, Frew EW and Humbert JS, “Reactive Control and Metric-Topological Planning for Exploration,” *International Conference on Robotics and Automation (ICRA)*, Paris, France, May 2020.
69. **Ahmad S**, Sunberg ZN and Humbert JS, “Probabilistic Depth Perception for 3D Reactive Obstacle Avoidance,” *American Control Conference*, New Orleans, LA, May 25-28, 2021.
70. **Ahmad S**, Mills AB, **Rush ER**, Frew EW and Humbert JS, “3D Reactive Control and Frontier-Based Exploration for Unstructured Environments,” *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, Prague, Czech Republic, Sept 27-Oct 1, 2021.

71. **Volchko A**, Mitchell SK, Morrissey TG and Humbert JS, "Model-Based Data-Driven System Identification and Controller Synthesis Framework for Precise Control of SISO and MISO HASEL-Powered Robotic Systems," *2022 IEEE 5th International Conference on Soft Robotics (RoboSoft)*, Edinburgh, UK, 2022, pp. 209-216, DOI: 10.1109/RoboSoft54090.2022.9762220.
72. **Ahmad S**, **Turin Z** and Humbert JS, "Bio-Inspired Obstacle Avoidance using Wavelet-Based Element Analysis," *2022 IEEE 18th International Conference on Automation Science and Engineering (CASE)*, Mexico City, Mexico, 2022, pp. 2307-2313, DOI: 10.1109/CASE49997.2022.9926537.
73. **Ahmad S** and Humbert JS, "Efficient Sampling-Based Planning for Subterranean Exploration," *2022 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, Kyoto, Japan, 2022, pp. 7114-7121, DOI: 10.1109/IROS47612.2022.9982169.

iii. Refereed Abstracts\*

1. Humbert JS, Murray RM, and Dickinson MH, "Wide-Field Integration Based Navigation and Flight Control Systems," *International Conference on Insect Sensors and Robotics*, Brisbane, Australia, 2004. **Winner of best student poster prize.**
2. Humbert JS, "Bio-Inspired Visuomotor Convergence," *International Symposium on Flying Insects and Robotics*, Ascona, Switzerland, 2007.
3. Humbert JS, "Bio-Inspired Visuomotor Convergence," *International Conference on Adaptive Motion of Animals and Machines*, Cleveland, OH, June 2008.
4. **Conroy JK** and Humbert JS, "Wide-Field Integration for Corridor Navigation of a Micro Helicopter," *IROS Workshop on Visual Guidance Systems for Small Autonomous Aerial Vehicles*, Nice, France, September 2008.
5. Humbert JS and **Hyslop AM**, "Control-Theoretic Interpretations of Tangential Cell Sensitivity Patterns," *2<sup>nd</sup> International Conference on Invertebrate Vision*, Sweden, September 2008.

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\* Names in boldface indicate students under J. Sean Humbert's direct supervision.

6. Humbert JS and **Hyslop AM**, “Interpretations of HS Tangential Cell Sensitivity Patterns,” *Sensors and Sensing in Biology and Engineering*, Calabria, Italy, October 2008.
  7. **Vance JT** and Humbert JS, “Mechanisms of Gust Rejection in the Honeybee *Apis mellifera*,” *Society for Integrative and Comparative Biology*, Seattle, Washington, January 2010.
  8. **Vance JT** and Humbert JS, “The Effects of Differential Wing Stroke Amplitude and Offset on Insect Body Moments During Perturbed Flight Conditions,” *American Society of Biomechanics*, Rhode Island, August 2010.
  9. Vance JT, **Faruque IA** and Humbert JS, “Strategies for Mitigating Gust Perturbations in Insects,” *7<sup>th</sup> Annual World Congress of Biomechanics*, Boston, MA, July 6-11, 2014.
  10. Vance J, Faruque IA, and Humbert JS, “Mechanisms of Gust Rejection in Stalk-Eyed Flies,” *8<sup>th</sup> International Congress of Dipterology*, Potsdam, Germany, August 10-15, 2014.
  11. Vance J and Humbert, JS, “Optomotor Response to Simulated Yaw Rotations During Tethered Flight in *Apis mellifera*,” *Society of Integrative and Comparative Biology, Southeast Regional Meeting for Division of Vertebrate Morphology and Division of Comparative Biomechanics*, Chapel Hill, NC, October 22, 2014.
  12. Vance J and Humbert, JS, “Optomotor Response to Simulated Yaw Rotations During Tethered Flight in Honey Bees, *Apis mellifera*,” *Society of Integrative and Comparative Biology, Annual Meeting*; Palm Beach, FL, January 3-7, 2015.
  13. Collett AN, Vance J and Humbert, JS, “Optomotor Response to Simulated Egomotion During Tethered Flight in Honey Bees, *Apis mellifera*,” *Society of Integrative and Comparative Biology, Annual Meeting*; Portland, OR, January 3-7, 2016.
- iv. Unrefereed Conference Proceedings\*
1. Shoemaker PA and Humbert JS, “Progress on Bio-Inspired Visual Navigation,” *GNC Challenges for Miniature Autonomous Systems Workshop*, October 2008.

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\* Names in boldface indicate students under J. Sean Humbert’s direct supervision.

2. Shoemaker PA and Humbert JS, "Vision-Based Local Guidance and Collision Avoidance with Elaborated Motion Detection Models," *Autonomous Weapons Summit and GNC Challenges for Miniature Autonomous Systems Workshop*, October 2010.
  3. **Miller DS, Gremillion G, Ranganathan B, Samuel PD**, Zarovy S, Costello M, Mehta A, and Humbert JS, "Challenges Present in the Development and Stabilization of a Micro Quadrotor Helicopter," *Autonomous Weapons Summit and GNC Challenges for Miniature Autonomous Systems Workshop*, October 2010.
  4. **Gremillion G, Samuel PD** and Humbert JS, "Yaw Feedback Control of a Bio-Inspired Flapping Wing Vehicle," *Proceedings of the SPIE Conference on Defense, Security and Sensing*, 8373, Baltimore, MD, May 2012.
- v. Unrefereed Abstracts
1. Humbert JS, Chopra I, Fearing RS, Full RJ, Wood RJ and Dickinson MH, "Development of Micromechanics for Micro Autonomous Systems (ARL-MAST CTA Program)," *SPIE Proceedings 7318*, April, 2009.
- f. Films, CDs, Photographs, etc.
- g. Exhibits, Performances, Demonstrations, and Other Creative Activities
- h. Original Designs, Plans, Inventions, Software, and/or Patents.
- i. *Vision Based Hover in Place*: Application of wide-field integration techniques to rotary wing MAVs for stable hover. Joint hardware implementation with Dr. Geoff Barrows of Centeye. **Patent pending, application number 61320718.**
  - ii. *Flapping Wing Insect Inspired Micro Aerial Robotic Vehicle*: Novel flapping wing robot which uses insect-inspired wing kinematics and actuation technologies for both lift generation and control. Joint hardware implementation with Dr. Paul Samuel of Daedalus Flight Systems and Dr. Imraan Faruque. **Patent pending, application number 61816573.**
  - iii. *Distributed Acceleration Sensing for Robust Disturbance Rejection*: Application of proprioceptive sensing techniques to provide gust rejection and improving vehicle stability. Joint hardware implementation with Riley Griffin and Edward Scott, Aurora Flight Sciences. **Patent pending, application number 61157US01.**
  - iv. *Bio-Inspired Small-Field Obstacle Detection*: Bio-inspired processing of visual information to extract small-field obstacles for use in navigation. Joint with Dr. Hector Escobar Alvarez. **Provisional patent application no. 62/365,482.**

- i. Fellowships, Prizes, and Awards.
  - i. Woodward Faculty Award, Department of Mechanical Engineering, 2022
  - ii. 3<sup>rd</sup> Place, DARPA Subterranean Challenge, \$500K Prize, 2021
  - iii. Graduate Teaching Award, Department of Mechanical Engineering, 2020
  - iv. Denver Business Challenge Professor, 2019-Present
  - v. McLagan Family Faculty Fellow, 2015-2018
  - vi. Best Paper in the *Advances in UAS Technologies I* Session, AIAA Guidance, Navigation and Control Conference, 2015
  - vii. Best Paper in the *Novel Navigation, Estimation and Tracking Methods I* Session, AIAA Guidance, Navigation and Control Conference, 2015
  - viii. AIAA Associate Fellow, 2014
  - ix. Techno-Sciences Associate Professor of Aerospace Engineering Innovation Faculty Fellowship, 2014-2017
  - x. Army Research Office (ARO) Young Investigator Award, 2010-2012
  - xi. Best Paper in the *Dynamics and Control of Nano-Class Unmanned Systems (Invited)* Session, American Control Conference (ACC), 2010
  - xii. Best Paper in the *Helicopter Control* Session, American Control Conference (ACC), 2010
  - xiii. Best Paper in the *Marine Systems II* Session, American Control Conference (ACC), 2010
  - xiv. AIAA National Capital Section Hal Andrews Young Engineer of the Year Award, 2009
  - xv. AIAA Outstanding Professor of the Year, Department of Aerospace Engineering, UMCP, 2007
  - xvi. AIAA Outstanding Mentor Award, Department of Aerospace Engineering, UMCP, 2006
  - xvii. Best Paper Award, AIAA Conference on Guidance, Navigation and Control, 2005
  - xviii. Best Student Paper, American Control Conference (ACC), 2004
  - xix. Best Poster Prize, International Conference on Insect Sensors and Robotics, 2004
  - xx. Departmental Citation, Mechanical Engineering, University of California, Davis, 1997
  
- j. Editorships, Editorial Boards, and Reviewing Activities for Journals and Other Learned Publications.
  - i. Journal Paper Reviewer for
    1. *IEEE Transactions on Automatic Control*, 2006-present
    2. *IEEE Transactions on Robotics*, 2005-present
    3. *Biological Cybernetics*, 2006-present



4. *AIAA Journal of Aerospace Computing, Information and Communication*, 2006 - 2007
5. *Journal of the American Helicopter Society (AHS)*, 2007-2008
6. *Journal of Experimental Biology*, 2005 – present
7. *AIAA Journal of Aircraft*, 2006-present
8. *AIAA Journal of Guidance, Control and Dynamics*, 2005-present
9. *Journal of Aerospace Engineering*, 2009
10. *Proceedings of the National Academy of Sciences (PNAS)*, 2010
11. *Journal of Systems and Control Engineering*, 2009
12. *Autonomous Robots*, 2010
13. *Bioinspiration and Biomimetics*, 2010-present
14. *Advanced Science*, 2023

ii. Conference Paper Reviewer for

1. International Federation of Automatic Control (IFAC) World Congress
2. IEEE Conference on Decision and Control (CDC)
3. American Control Conference (ACC)
4. IEEE Conference on Control Applications (CCA)
5. AIAA Conference on Atmospheric Flight Mechanics
6. AIAA Conference on Guidance, Navigation and Control
7. IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)
8. IEEE International Conference on Robotics and Automation (ICRA)

k. Other

a. Teaching Awards and Other Special Recognition.

- i. AIAA Outstanding Mentor Award, Department of Aerospace Engineering, UMCP, 2006
- ii. AIAA Outstanding Professor of the Year, Department of Aerospace Engineering, UMCP, 2007
- iii. Graduate Teaching Award, Department of Mechanical Engineering, 2020

4. Service

a. Professional

- i. Offices and committee memberships held in professional organizations.
  1. AIAA Guidance, Navigation, and Control Technical Committee Associate Member (2010)
- ii. Reviewing activities for agencies
  1. Air Force Office of Scientific Research
    - a. Proposal review
  2. Army Research Office

- a. Proposal review
    - 3. Office of Naval Research
      - a. Proposal review
  - iii. Other unpaid services to local, state, and federal agencies
    - i. Member, DARPA Microsystems Exploratory Council (MEC), (2022-present)
    - ii. Core Member, Board on Army RDT&E, Systems Acquisition, and Logistics (BARSL), reporting to the Hon. Dr. Bruce Jetty, Assistant Secretary of the Army, Acquisition, Logistics and Technology (2019-Present)
    - iii. Member, Board of Directors, Colorado Space Business Roundtable, (2019-2020)
    - iv. Member, Board on Army Science and Technology (BAST) of the National Academies of Science, Engineering and Medicine (2015-2019)
    - v. Member, Committee on Counter Unmanned Aircraft Systems (CUAS) for Battalion and Below Operations of the National Academies of Science, Engineering and Medicine. *Report*: <http://www8.nationalacademies.org/onpinews/newsitem.aspx?RecordID=24747>
  - iv. Other non-University committees, commissions, panels, etc.
    - i. Professional Society Service
      - 1. Co-Chair, Session on Bio-Inspiration and Biorobotics, American Control Conference, 2006
      - 2. Co-Chair, Session on Biomimetics, IEEE International Conference on Intelligent Robots and Systems, 2007
      - 3. Program Committee, SPIE Optics & Photonics Symposium, Bio-Sensing, San Diego, 2008
      - 4. Program Committee, SPIE Bio-Inspired / Biomimetic Sensor Technologies and Applications, Orlando, 2009
      - 5. Program Committee, American Control Conference, Denver, CO, 2020
    - ii. Patuxent Policy Group, Panelist: “Consequences of Robotic Progress for Society, Markets and U.S. Defense,” *Center for the Study of Democracy, St. Mary’s College of Maryland*, March 2010.
  - v. International activities not listed above
- b. Campus
  - i. Departmental.
    - 1. Department Chair Search Committee: 2009 (UMD)
    - 2. Aerospace Engineering Internal Review Committee: 2010-2011 (UMD)
    - 3. Graduate Committee 2011-2015 (UMD)
    - 4. Member, External Advisory Committee 2015-2016 (CU)
    - 5. Chair, External Relations Committee 2016-2017 (CU)

6. Member, Mechanical Engineering Search Committee 2016-2017 (CU)
7. Ad Hoc Committee on Instructor and Research Professor Pathway 2016 (CU)
8. Chair, Controls and Dynamics Prelim Committee, 2016, 2017, 2018, 2019
9. Member, Mechanical Engineering Department Chair Search Committee, 2018-2019
10. Associate Chair – Mechanical Engineering, 2019-2021
11. Linear Systems Prelim Exam Committee (AES), 2019, 2020
12. Member, Mechanical Engineering Personnel Committee, 2019-2021
13. Chair, Faculty Search Committee (Robotics), 2022-2023

ii. College

1. 3D Printing / Additive Manufacturing Committee 2014 (UMD)
2. CU Robotics Center (6/17-present) – this effort is a study to understand where CU should invest time and resources to become a national leader in 2-4 areas of robotics.
3. Chair, interdisciplinary search committee in Robotics, Dynamics and Control (3 faculty lines) (8/17-present)
4. Faculty Director, Aerospace and Defense (6/18-6/19)
5. ME Representative for Robotics, Control and Dynamical Systems (RCDS) Seminar Series (2018)
6. Co-Chair, Executive Director National Security Search Committee (6/18-6/19)

iii. Special administrative assignments

iv. Other

- c. Community, State, National
- d. Service Awards and Honors