

Aaron Estes

Contact Information

Department of Mechanical and Aerospace Engineering
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Education:

Ph.D. Mechanical Engineering, University at Buffalo, 2016
B.S.E. Mechanical Engineering, Arizona State University, 2011

Technical Interests:

Game-Based Learning in Engineering Higher Education, Dynamics and Control, System Identification

Employment History:

1/17 – present **Assistant Professor of Teaching**, Department of Mechanical and Aerospace Engineering, University at Buffalo
8/16 – 12/16 **Adjunct Instructor**, Department of Mechanical and Aerospace Engineering, University at Buffalo
5/16 – 7/16 **MAE Ph.D. Teaching Fellow**, Department of Mechanical and Aerospace Engineering, University at Buffalo
1/16 – 5/16 **Research Assistant**, Department of Mechanical and Aerospace Engineering, University at Buffalo
8/11 – 12/15 **Teaching Assistant**, Department of Mechanical and Aerospace Engineering, University at Buffalo

Honors and Awards:

- **Vanderhoef Faculty Award**, University at Buffalo (2019)
- **Professor of the Year**, awarded by Tau Beta Pi Engineering Honor Society, University at Buffalo (2018)
- **Excellent Reviewer Recognition**, *AIAA Journal of Guidance, Control, and Dynamics*, Oct. 1, 2017 – Sept. 30, 2018; Oct. 1, 2015 – Sept. 30, 2016.
- **Teaching Assistant of the Year**, awarded by Tau Beta Pi Engineering Honor Society, University at Buffalo (2013)
- **National Merit Finalist Scholarship**, Arizona State University (2007-2011)

Teaching Experience

Assistant Professor of Teaching, University at Buffalo

- Digital Control Systems (MAE 405/544): Spring 2020, Spring 2019
- System Identification (MAE 460/566): Spring 2018
- Flight Dynamics (MAE 436): Fall 2017
- Road Vehicle Dynamics (MAE 454/554): Fall 2019, Fall 2018, Fall 2017
- Dynamic Systems (MAE 340): Summer 2019, Fall 2018, Fall 2017
- Manufacturing Processes (MAE 364): Spring 2017
- MAE Laboratory I (MAE 334): Spring 2020, Spring 2019, Spring 2018, Spring 2017
- UB Seminar—The Places You’ll Go (EAS 198): Fall 2019

Adjunct Instructor, University at Buffalo

- Road Vehicle Dynamics (MAE 454/554): Fall 2016

MAE Ph.D. Teaching Fellow, University at Buffalo

- Dynamic Systems (MAE 340): Summer 2016

Teaching Assistant, University at Buffalo

- Dynamic Systems (MAE 340): Fall 2014, Fall 2013, Fall 2012, Fall 2011
- Dynamics (EAS 208): Spring 2013, Spring 2012, Spring 2011
- Mechanical Engineering Laboratory I (MAE 334): Spring 2014
- Continuous Control Systems (MAE 443/543): Fall 2015

Journal Articles

2. Mou, F., Khakpour, H., **Estes, A.**, Hall, J., “Weighted Least Squares Approach for an Adaptive Aerodynamic Engineered Structure with Twist Transformation” *ASME Journal of Energy Resources Technology*, 141(5), 051207 (Feb 18, 2019), [doi: 10.1115/1.4042642](https://doi.org/10.1115/1.4042642).
1. **Estes, A.**, and Manoranjan Majji. "Generalization of Lagrange’s Equations for Constrained Hybrid-Coordinate Systems." *Journal of Guidance, Control, and Dynamics* 40.3 (2016): 710-713., [doi: 10.2514/1.G000450](https://doi.org/10.2514/1.G000450).

Conference Publications

6. Hulme, K., **Estes, A.**, Schiferle, M., Lim. R., “Game-based Learning to Enhance Post-secondary Engineering Training Effectiveness” *Interservice/Industry Training, Simulation, and Education Conference*, Dec., 2019.
5. Hulme, K., **Estes, A.**, Schmid, M., Torres, E., Hendrick, C., Sivashangaran, S., “Game-based Proving-grounds Simulation to Assess Driving & Learning Preferences” *Interservice/Industry Training, Simulation, and Education Conference*, Nov., 2018.
4. Mou, F., Khakpour, H., **Estes, A.**, Hall, J., “Weighted-Least Squares Optimization Method for Control and Shape Design of an Adaptive Blade Twist Distribution to Increase Wind Capture,” *ASME Dynamic Systems and Control Conference*, Atlanta, GA, Sep. 30-Oct. 3, 2018, [doi:10.1115/DSCC2018-9233](https://doi.org/10.1115/DSCC2018-9233).
3. Mou, F., Khakpour, H., **Estes, A.**, Hall, J., “A Weighted-Least Squares Approach for the Design of Adaptive Aerodynamic Structures Subjected to an Out-Of-Plane Transformation,” *ASME International Design Engineering Technical Conferences & Computer and Information in Engineering Conference*, Quebec City, Canada, Aug. 2018, [doi:10.1115/DETC2018-86101](https://doi.org/10.1115/DETC2018-86101).
2. **Estes, A.**, Singh, T., Majji, M., “A Post-maneuver Penalty Approach to Robust Input-Shaper Design,” *AIAA/AAS Astrodynamics Specialist Conference*, Vail, CO, Aug. 2015, AAS 15-811.
1. **Estes, A.**, Majji, M., Juang, J., “Time-Varying Methods for Identification of Constrained Flexible Structures,” *AIAA/AAS Astrodynamics Specialist Conference*, San Diego, CA, Aug. 2014, AIAA 2014-4305, <https://doi.org/10.2514/6.2014-4305>.

Research Proposals

Funded:

- “Motion Simulation in Road Vehicle Dynamics Course,” *Experiential Learning Network Course Infusion Fund*, University at Buffalo, \$500, **Awarded**, September 23, 2019
- “Generating Models for Systems Based on Their Response to Unmeasured Inputs,” *NSF East Asia and Pacific Summer Institutes for U.S. Graduate Students (EAPSI)*, PI: Aaron Estes, \$5,070, **Awarded**, June 24, 2015

Under Review:

- “CONVERGENT: Certification, Observation, and Verification of Experiential Game-based learning to improve engagement and outcomes in post-secondary Engineering Education,” **Co-PI** (PI: Kevin Hulme, SEAS; Co-PI: Presentacion Rivera-Reyes, DEE; Co-PI: Jesse Hartloff, CSE) \$1,400,000; *Institute of Education Sciences (IES) : Education Research CFDA Number 84.305A Department of Education*; August 2019

M.S. Thesis Supervision

- Schifferle, Mark. “Implementation of Serious Gaming in Road Vehicle Dynamics Higher Education” Expected, expected Spring 2020. (2019 I/ITSEC Scholarship Awardee, \$5,000, Aug. 2019)

M.S. Project Supervision

- Iyer, Gaurav Ranganathan. “Development of a High-Fidelity Driving Simulator Using the Unreal Gaming Engine” completed November, 2019.

Graduate Student Committee Membership

4. Liu, Wansong, M.S. Thesis, “An Audio-Based Fault Diagnosis Method for Quadrotors Using Convolutional Neural Network and Transfer Learning” *University at Buffalo*, Fall 2019.
3. Shurirkar, Aditya, M.S. Project, “Linear Disturbance Observer-Based Controller for UAV” *University at Buffalo*, Spring 2019.
2. Forte, Livio, M.S. Thesis, “Low-Cost Method of Estimating Vehicle Sideslip and Tire Cornering Stiffness using Global Positioning and Inertial Measurement” *University at Buffalo*, Spring 2019.
1. Mou, Fuzhao, M.S. Thesis, “Weighted Least Squares Approach for an Adaptive Aerodynamic Engineered Structure with Twist Transformation” *University at Buffalo*, Spring 2018.

M.S. Individual Problem Supervision

- Luke Joy, “Design and Testing of Self-Balancing Robot Using Arduino Microcontroller,” *MAE 501 Individual Problem* (Summer 2019)

Undergraduate Research Supervision

Supervised **31 UG students** since Summer 2017 in the areas of dynamics and control and its applications to virtual reality and haptics; game-based learning; and miscellaneous topics including automatic tire-balancing, autonomous snow-blowing, 3D-printer filament recycling and extrusion, and automatic chlorine dispensing for above-ground pools. Students were supported through the **McNair Scholars Program, CSTEP, LSAMP**, and MAE 498. Students have presented their work at the **2018 and 2019 SUNY SURC research conferences**, **four** groups were funded through **CURCA**, one group had an abstract accepted at the **2019 I/ITSEC conference**, one student received the **Zimmer Scholarship**, and another student was nominated for the **Goldwater Scholarship**.

Guest Lectures/ Invited Talks

- “A Discussion on Learning Styles,” *Women in Science and Engineering*, University at Buffalo, Oct. 10, 2019.
- Academic Panel, *STEM Diversity Conference*, University at Buffalo, April 7, 2018.
- “A Professor’s Perspective,” *Society of Hispanic Professional Engineers*, University at Buffalo, March 7, 2017.
- “Data Analytics with Python,” *CIS 512 Introduction to Data Science*, Buffalo State College, SUNY, Nov 1, 2016.

Service

- Freshman-Faculty Mentor Program (Spring 2020)
- Faculty Committee: Women in Science and Engineering (WiSE) (since Fall 2018)
- Instructor *UB Seminar—The Places You’ll Go (EAS 198)* (Fall 2019)
- MAE Scholarship Review Committee (Since Fall 2018)
- MAE Student Excellence and Diversity Committee (Since Fall 2017)
- MAE Faculty Mentor, (Fall 2018, Spring 2018, Fall 2017)
- Sustainable Manufacturing and Advanced Robotic Technologies (SMART) Infrastructure Committee (Spring 2017)
- Reviewer: (2020, 2016) American Control Conference; Journal of Guidance, Control, and Dynamics; Journal of Astronautical Sciences