



# Dae Young Lee

Assistant Professor

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## Education

**Ph.D.** Aerospace Engineering, University of Michigan, 2016  
**M.S.** Aerospace Engineering, University of Michigan, 2015  
**M.S.** Mechanical Engineering, Pusan National University (South Korea), 2001  
**B. S.** Mechanical Engineering, Pusan National University (South Korea), 1997

## Academic Appointments

**Iowa State University (2018-present)**  
Department of Aerospace Engineering  
▪ *Assistant Professor*

**University of Texas at Austin (2016-2018)**  
Center for Space Research  
▪ *Postdoctoral researcher*

## Awards and Honors

## Teaching

**UNDERGRAD:** AerE 433 Spacecraft Dynamics and Control, AerE 464 Spacecraft Systems.

## Research

### Interest Areas:

- Design, development, and operation of a CubeSat Fleet.
- Spacecraft dynamics and control: ▪ Formation flight of CubeSat fleet; ▪ Mars entry, descending, and landing (EDL).
- Nonlinear model predictive control: ▪ Computational solver development; ▪ Attitude control based on geometric mechanics;
- Attitude determination filter for spacecraft.

## Selected Publications

1. **Lee, D.Y.**, Park, H., Romano, M., Cutler, J.W. (2018). "Development and Experimental Validation of a Multi-Algorithmic Hybrid Attitude Determination and Control System for a Small Satellite," *Aerospace Science and Technology*, Vol. 78, pp. 494-509.
2. **Lee, D.Y.**, Gupta, R., Kalabic, U.V., Di Cairano, S., Bloch, A.M., Cutler, J.W., Kolmanovsky, I.V. (2017). "Geometric Mechanics Based Nonlinear Model Predictive Spacecraft Attitude Control with Reaction Wheels," *Journal of Guidance Control and Dynamics*, Vol. 40 Special Issue on Computational Guidance and Control, pp. 309-319.
3. **Lee, D.Y.**, Cutler, J.W., Mancewicz, J., Ridley, A.J. (2015). "Maximizing Photovoltaic Power Generation of a Spacecraft Configure Satellite," *Acta Astronautica*, Vol. 111, pp. 283-299.
4. Hwang, J.T., **Lee, D.Y.**, Cutler, J.W., Martins, J.R.R.A. (2014). "Large-Scale Multidisciplinary Optimization of a Small Satellite's Design and Operation," *Journal of Spacecraft and Rockets*, Vol. 51, No. 5, pp. 1648-1663.
5. Mammarella, M., **Lee, D.Y.**, Park, H., Capello, E., Dentis, M., Guglieri, G. (2019). "Attitude Control of a Small Spacecraft via Tube-Based Model Predictive Control," *Journal of Spacecraft and Rockets*, pp. 1-18.
6. Choi, J.W., **Lee, D.Y.** (1998). "A Fault Isolation Filter Design Using a Left Eigenstructure Assignment Scheme," *ICASE Journal*, Vol. 4, No. 6, pp. 695-702.
7. Mammarella, M., **Lee, D.Y.**, Park, H., Capello, E., Dentis, M., Guglieri, G., Romano, M. (2018). "Attitude Control of a Small Spacecraft for Earth Observation via Tube-based Robust Model Predictive Control," *AIAA SPACE and Astronautics Forum and Exposition in Orlando, FL, Sept. 2018*.
8. Cervellini, G., Park, H., **Lee, D.Y.**, Pastorelli, S., Romano, M. (2018). "Development and Laboratory Experimentation of a Magnetorquer Control System for CubeSat Using a Three-axis Simulator," *AAS/AIAA Astrodynamics Specialist Conference in Snowboard, UT, Aug. 2018*.
9. **Lee, D.Y.**, Sharma, S., Park, H., Cutler, J.W. "Design and Optimization of a Small Satellite Communication System," *AIAA Aerospace Sciences Meeting in Kissimmee, FL, Jan. 2018*.
10. **Lee, D.Y.**, Park, H., Romano, M., Cutler, J.W. (2017). "Design and Validation of Hybrid Attitude Determination and Control System for CubeSat through Hardware-in-the-loop Simulation," *27<sup>th</sup> AASIAA Space Flight Mechanics Meeting in San Antonio, TX, Feb. 2017*.
11. **Lee, D.Y.**, Gupta, R., Kalabi, U.V., Di Cairano, S., Bloch, A.M., Cutler, J.W., Kolmanovsky, I.V. (2016). "Constrained Attitude Maneuvering of a Spacecraft with Reaction Wheel Assembly by Nonlinear Model Predictive Control," *American Control Conference in Boston, MA, July, 2016*.
12. **Lee, D.Y.**, Park, H., Cutler, J.W. (2016). "Development of CubeSat Attitude Determination and Control System with Hybrid Control Strategy and its Simulator on SO(3)," *26<sup>th</sup> AASIAA Space Flight Mechanics Meeting in Napa, CA, Feb. 2016*.
13. Hwang, J.T., **Lee, D.Y.**, Cutler, J.W., Martins, J.R.R.A. (2014). "Large-Scale MDO of a Small Satellite using a Novel Framework for the Solution of Coupled Systems and their Derivatives," *54<sup>th</sup> AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference in Boston, MA, April, 2014*.
14. **Lee, D.Y.**, Springmann, J.C., Spangelo, S.C., Cutler, J.W. (2011). "Satellite Dynamics Simulator Development Using Lie Group Variational Integrator," *AIAA Modeling and Simulation Technologies Conference in Portland, OR, Aug. 2011*.

## Thesis Advisor/Co-advisor and Postgraduate-Scholar Sponsor

## Professional and Outreach Activities

- Member: Institute of Electrical and Electronics Engineers (IEEE), American Institute of Aeronautics and Astronautics (AIAA);
- Reviewer: 3 Journals, Advances in Space Research; Journal of Guidance, Dynamics, and Control; and Acta Astronautica.