Di Wu, Ph.D. Student

Contact Information

Aerospace and Mechanical Engineering
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Education

University of Arizona, Tucson, Arizona

Ph.D., Aerospace Engineering, Present

University of Michigan, Ann Arbor, Ann Arbor, Michigan

M.S.E., Aerospace Engineering, May 2017

Beihang University, Beijing

B.S., Space Engineering, Guidance Navigation and Control Emphasis, June 2015
Honors Scholar

Research Interests

Astrodynamics, Celestial Mechanics, and Dynamical Astronomy
Resident Space Objects (RSO) and Space Situational Awareness (SSA)
Applied and Computational Mathematics, Machine Learning
Nonlinear Dynamics, Detection and Estimation Theory

Current research directions include the application of Dynamical Systems Theory to Space Situational Awareness (SSA) and Space Traffic Management (STM) to define perennial ad-hoc practices and techniques to make space a secure, sustainable, and transparent resource.

Professional References

Dr. Aaron J. Rosengren, ajrosengren@email.arizona.edu, +1 (520) 621-6088
Assistant Professor
Department of Aerospace and Mechanical Engineering
The University of Arizona, Tucson, Arizona USA

Dr. Ehsan Taheri, etaheri@auburn.edu, +1 (334) 844-5106
Assistant Professor
Department of Aerospace Engineering
Auburn University, Auburn, Alabama USA

Research Experience

University of Arizona, Tucson, Arizona USA

Spaceflight, Applied Mechanics & Orbital Systems Laboratory (SAMOS) **May 2018 to Now**

- First PhD student
- Advisor: Prof. Aaron J. Rosengren
- Research Topics:
  - Resident Space Object (RSO) characterization, classification, and taxonomy, Space Situation Awareness (SSA)
  - Space objects maneuvers detection and prediction, Space Traffic Management (STM)
  - Solar system multi-body manifolds and dynamics

University of Michigan, Ann Arbor, Ann Arbor, Michigan USA

Aerospace Engineering Department **January 2017 to February 2018**

- Graduate Researcher
- Advisor: Dr. Ehsan Taheri
- Research Topics:
  - Interplanetary mission design and optimization
  - Low-thrust trajectory dynamics and preliminary design

Teaching Experience

University of Arizona, Tucson, Arizona USA

Aerospace and Mechanical Engineering Department **January 2020 to Present**

- Teaching Assistant
- Courses: Orbital Mechanical and Space Flight; Dynamics
- Instructor: Aaron J. Rosengren
- Created and taught recitation lectures on fundamental dynamics, astrodynamics numerical propagation

University of Michigan, Ann Arbor, Ann Arbor, Michigan USA

Aerospace Engineering Department **August 2017 to December 2017**

- Instructor Assistant
- Courses: Avionics, Navigation and Guidance of Aerospace Vehicles
- Instructor: Dimitra Panagou
- Created and held office hours on aerial robot Kalman filter estimation course projects

Honors and Awards

- 2019 IAF Emerging Space Leaders (ESL), International Astronautical Federation (IAF), 2019 International Astronautical Congress (IAC), Washington D.C., USA, October 2019
- Excellence Undergraduate Scholar, School of Astronautics, Beihang University, Beijing, China, June 2016
- Lee Kum Kee Aerospace Scholarship, Lee Kum Kee International Holdings Ltd., China, September 2015
- Excellence in National Undergraduate Training, National Undergraduate Training Program Committee, China, February, 2015

Publications

Submitted Manuscripts (1)

Todorović, N., **Wu, D.**, and Rosengren, A.J., "The Arches of Fast Chaotic Transport in the Solar System," Submitted to *Nature*, January, 2020.

Todorović, N., Rosengren, A.J., and **Wu, D.**, "The chaotic Autobahn of the Solar System," talk will be presented at the *IAU Symposium 364, Multi-scale (time and mass) dynamics of space objects*, Iaşi, Romania, July 2020.

Journal Articles and Conference Papers (1)

Wu, D., and Rosengren, A.J., "Analysis of Proper Orbital Element for Resident Space Objects," paper presented at the *70th International Astronautical Congress*, Washington, DC, 21–25 October 2019.

Wu, D., and Taheri, E., "Complex Trajectory Design with Low-Thrust Based Motion Primitives," paper presented at the *2018 AIAA SciTech Forum*, Kissimmee, FL, United States, Jan 8 - 12, 2018.

Taheri, E., **Wu, D.**, Lee, C., Shimoun, J., Abdelkhalik, O., Zou, S., Darani, S., Jackson, B., and Liimatta, J., "GTOC9: Results from Team Michigan Tech University-University of Michigan," Acta Futura, 11, 99–107, 2018.

Wu, S., Wang, W., **Wu, D.**, Chen, C., Zhu, P., Liu, R., "Analysis on GPL?s Dynamic Gait for a Gecko Inspired Climbing Robot with a Passive Waist Joint," paper presented at the *2014 IEEE International Conference*, Bali, Indonesia, Dec 5 - 10, 2014.

Service to Professional Societies

Professional Memberships

- American Astronautical Society (AAS), January 2020 to Present
- AME Student Representative to the Graduate Studies and Research Committee (GSRC), September 2019 to Present
- Society of Satellite Professionals International (SSPI), September 2018 to Present
- Space Safety and Sustainability, Space Generation Advisory Council (SGAC), November 2018 to September 2019
- National Space Society (NSS), September 2018 to September 2019