Pengcheng Wu

CONTACT INFORMATION

Address:
Engineering Building Unit I, Room 2205, La Jolla, CA, 92093;
5500 Campanile Dr, E302, San Diego, CA, 92182

Phone: +1-919-903-5793
E-mail: pcwupat@ucsd.edu
pwu@sdsu.edu
Web: pengcheng-wu.github.io

BIOGRAPHY

I am now a PhD student with the Joint Doctoral Program of Mechanical and Aerospace Engineering, University of California, San Diego and San Diego State University. My research advisors are Professor Jun Chen and Professor Sonia Martínez. I received both Bachelor and Master degree from Department of Aerospace Engineering, Nanjing University of Aeronautics and Astronautics, advised by Professor Dongping Jin and Professor Hao Wen. My research interests concentrate on dynamics, guidance and control for unmanned vehicles. Recently I am working on the data-driven path planning and control of multi-agent systems in the presence of uncertainty.

EDUCATION BACKGROUND

Ph.D. Student August 2019 - present

University of California San Diego / San Diego State University

- Joint Doctoral Program of Mechanical and Aerospace Engineering
- Advisors: Professor Jun Chen, Professor Sonia Martínez
- Doctoral Qualifying Exam (DQE) passed
- Research Topic: Data-driven path planning and control of multi-agent systems in the presence of uncertainty

Nanjing University of Aeronautics and Astronautics, Nanjing, Jiangsu, China

M.S., Dynamics and Control, Aerospace Engineering, April 2017

- Excellent Graduate Student
- Thesis: *Dynamic Modeling and Control for Space Structures Using Gyroscopes*
- Advisors: Professor Dongping Jin, Professor Hao Wen
- Area of Study: Dynamics and Control

B.S., Aerospace Engineering, June 2014

- Excellent Undergraduate Student
- Mechanics Specialization (with emphasis on structural strength and vibration)

PUBLICATIONS

[1] Safety Assured Online Guidance with Airborne Separation for Urban Air Mobility Operations in Uncertain Environments, P. C. Wu, X. X. Yang, P. Wei, J. Chen. *IEEE Transactions on Intelligent Transportation Systems*. (Submitted)

[2] Risk-bounded Path Planning for Unmanned Aircraft System Operations under Uncertainty, P. C. Wu, J. F. Xie, Y. C. Liu, J. Chen. *IEEE Transactions on Intelligent Transportation Systems*. (Submitted)

[3] Comparisons of RRT and MCTS for Safe Assured Path Planning in Urban Air Mobility, P. Wu, J. Chen. *AIAA SciTech Forum*, San Diego, California, 2022. (Accepted)

[4] Safe Path Planning for Unmanned Aerial Vehicle under Location Uncertainty, P. C. Wu, J. F. Xie, J. Chen. *16th IEEE International Conference on Control and Automation*, Sapporo, Hokkaido, Japan, 2020. (DOI:10.1109/ICCA51439.2020.9264542)

[5] Probabilistic Guaranteed Path Planning for Safe Urban Air Mobility using Chance Constrained RRT*, P. C. Wu, L. Li, J. F. Xie, J. Chen. *AIAA AVIATION Forum and Exposition*, Reno, Nevada, 2020. (DOI: 10.2514/6.2020-2914)

[6] Attitude Maneuver Control and Vibration Suppression of Spacecraft with Flexible Appendages via Control Moment Gyroscopes (in Chinese), Wu, P. C. *M. Sc. dissertation*, *Nanjing University of Aeronautics and Astronautics*, 2017.

[7] Model predictive control of rigid spacecraft with two variable speed control moment gyroscopes, Wu, P. C., Wen, H., Chen, T., and Jin, D. P. *Applied Mathematics and Mechanics*, 38(11), 1551-1564, 2017. (DOI: 10.1007/s10483-017-2278-9)

[8] The attitude maneuver of a large space structure based on nonlinear model predictive control (in Chinese), Wu, P. C., Wen, H., Chen T., and Jin, D. P. *The 2nd Academic Conference of Deployable Space Structures*, Beijing, China, 2016.

Professional Experience

Publication Reviewer

- IEEE Transactions on Intelligent Transportation Systems
- American Control Conference
- IEEE International Conference on Control and Automation
- AIAA Scitech Forum
- AIAA Aviation Forum and Exposition

Conference Attendance/Presentation

- AIAA SciTech Forum 2022 (coming)
- 16th IEEE International Conference on Control and Automation (October 2020)
- AIAA AVIATION Forum and Exposition (June 2020)
- UCSD MAE Graduate Seminar (March 2020)
- Southern California Control Workshop (January 2020)

Academic Society Membership

- Student Member, AIAA (2020 - present)
- Student Member, IEEE HKN (2020 - present)

Teaching Assistant

- AE696 State Space Flight Control

Research Assistant

- Department of Biomedical Engineering, UNC Chapel Hill, NC, US
  Aug. 2018 - May. 2019
  Topic: medical image segmentation and signal processing, filtering, 3D reconstruction, and finite element modeling
- State Key Laboratory of Mechanics and Control of Mechanical Structures, Nanjing, China
  Apr.2017 - Jul.2018

Topic: dynamic modeling and control of rigid or flexible spacecraft models using control moment gyros

Internship

- Shenyang Aircraft Corporation, Shenyang, Liaoning, China
  Jul.2013 - Aug.2013
  Topic: casting, forging, machining, and producing of metal assemblies and devices

EXPERTISE AND SKILLS

- Dynamic experiment instruments like binocular cameras, Zigbee, Spider81
- Computer aided design softwares like AutoCAD, Catia
- Image and signal processing softwares like ImageJ
- Finite element simulation softwares like Ansys, Abaqus
- Programming languages like Python, Matlab (and Simulink)
- Dynamic modeling of mechanical systems
- Popular algorithms of path planning and control for unmanned vehicles

HONORS AND AWARDS

- University Fellowship 2021-2022
- Admission into IEEE HKN Jan. 2020
- Excellent Student Scholarship 2017
- Award of the Excellent Graduate Student Apr. 2017
- First prize in Mathematical Modeling Competition Jun. 2016
- Full Scholarship for Master Student Sep. 2014
- First prize in 4th Social Science Competition for Engineering Students Jun. 2013
- First prize in Fluid Mechanics Experiment Competition Dec. 2012