

BINGHENG WANG

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ResearchGate ◇ https://www.researchgate.net/profile/Bingheng_Wang

EDUCATION

Northwestern Polytechnical University

Xi'an, China

Master of Engineering, Navigation, Guidance & Control

Sept.2015 - Mar.2018

Thesis: "Research on Tethered-Towing Removal for Dysfunctional Satellites"

GPA: Overall 90.03/100, Compulsory 88.74/100

Nanjing University of Aeronautics and Astronautics

Nanjing, China

Bachelor of Engineering, Detection Guidance & Control

Sept.2011 - Jun.2015

GPA: Overall 3.9/5 (equivalent 89/100), Compulsory 4/5 (equivalent 90/100)

TECHNICAL SKILLS

Algorithms

Model Predictive Control, Sliding Mode Control, Kalman Filter

Software

Matlab/Simulink, AutoCAD, Keil, Proteus, Labview

Programming Language

Matlab,C/C++, Python, Latex

SELECTED PUBLICATIONS

Journal Papers

1. **B.H. Wang**, Z.J. Meng, C. Jia, P.F. Huang, "Anti-tangle control of tethered space robots using linear motion of tether offset", *Aerospace Science & Technology*, vol.89, pp.163-174, 2019.
2. **B.H. Wang**, Z.J. Meng, P.F. Huang, "Attitude control of towed space debris using only tether", *Acta Astronautica*, vol.138, pp.152-167, 2017.
3. Z.J. Meng, **B.H. Wang**, P.F. Huang, "MPC-based anti-sway control of tethered space robots", *Acta Astronautica*, vol.152, pp. 146-162, 2018.
4. Z.J. Meng, **B.H. Wang**, P.F. Huang, "Twist suppression method of tethered towing for spinning space debris", *ASCE, Journal of Aerospace Engineering*, vol.30, no.4, 04017012, 2017.
5. Z.J. Meng, **B.H. Wang**, P.F. Huang, "A space tethered towing method using tension and platform thrusts" *Advances in Space Research*, vol.59, pp.656-669, 2017.

Conference Proceedings

1. **B.H. Wang**, M.Mihalec, Y.B.Gong, D.Pompili and J.G.Yi, "Disturbance observer-based motion control of small autonomous underwater vehicles", *Proceeding of ASME 2018 Dynamic Systems and Control Conference*, Atlanta, Georgia, USA, pp.V003T35A004, 2018.
2. **B.H. Wang**, Z.J. Meng, P.F. Huang, "A towing orbit transfer method of tethered space robots", *Proceeding of IEEE International Conference on Robotics and Biomimetics-ROBIO*, Zhuhai, China, pp.964-969, 2015.

Pending Papers

1. **B.H. Wang**, Z.J. Meng, C. Jia, et al, "Reel-based tension control of tethered space robots", *IEEE Transactions on Aerospace and Electronic Systems* (Minor revision, under 3th round review).

2. **B.H. Wang**, Z. Cheng, B. Liang, "Self-balance of stationary riderless bicycles via steering control: A trail perspective", *IEEE Transactions on Control Systems Technology* (Under review).

EXPERIENCE

Institute of Robotics, Southern University of Science and Technology Sept.2019 - Present
Research Assistant *Shenzhen, China*

- Identifying system parameters for a robotic fish by underwater experiments and physically-consistent convex optimization;
- Designing the prototyping of robotic surface vessels for cooperative control research.

Department of Automation, Tsinghua University Sept.2018 - Sept.2019
Mechanical Engineer *Beijing, China*

- Proposed a novel steering strategy to balance a stationary unmanned bicycle
 1. Developed a multi-body dynamic model whereby the degree of controllability with respect to the trail was analyzed to design the trail-dependent steering control law based on MPC algorithm;
 2. Tested the strategy in Matlab and on a robotic bicycle with a NiCRIO controller using LabVIEW.

Research Center of Intelligent Robotics, NWPU Mar.2015 - May2018
Graduate Research Assistant *Xi'an, China*

- Developed dynamic models and proposed control strategies for tethered space robots (TSR: a kind of special space robots with capture devices tethered to spacecraft) to safely remove space debris
 1. Simulated the multi-body dynamic model of TSR to study the potential risks like the collision of two end bodies, tether sway and tangle with the captured debris during the removal in Matlab;
 2. Applied advanced control, learning and estimation algorithms (e.g. MPC, SMC, EKF, RBFNN) to tackle control challenges like underactuation, constraints and uncertainties caused by these risks;
 3. Managed the project "Attitude Control of Tethered Space Robots for Debris Towing Removal" funded by Seed Foundation of Innovation for Graduate Students in NWPU (Grant No. Z2016050);
 4. Designed the ground experiment using STM32 microcontroller to evaluate the theoretical methods;

CO-OP ACTIVITIES

Rutgers, The State University of New Jersey Jan.2018-Apr.2018
Research Assistant *Xi'an, China*

- Designed a disturbance-observer-based MPC motion controller for an underwater vehicle, evaluated the algorithm in Matlab and remotely assisted the experiments setup.

Technion-Israel Institute of Technology Jul.2016-Aug.2016
Visiting Student *Haifa, Israel*

- Attended a course "Distributed Spacecraft Systems" taught by Prof. Pini Gurfil, score: 96/100.

HONORS & AWARDS

Ph.D. Research Assistantship of Purdue University, *canceled by U.S. visa problems* Aug.2019
 Distinguished Master's Thesis Award of NWPU Oct.2018
 Ph.D. Fellowship of Rutgers University, *declined* Apr.2018
 National Graduate Scholarship (twice) Nov.2016 and Dec.2017