

Heng SHI

CONTACT INFORMATION

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RESEARCH INTERESTS

Guidance, navigation & control; Cooperative Guidance; Aircraft control; Intelligent control; Sensor fusion

EDUCATION

Tsinghua University, Beijing, China

Ph.D., Computer Science & Technology (anticipated 2020) Sep 2015 to present

- Advisor: Prof. Jihong Zhu
- State Key Laboratory of Intelligent Technology and Systems

Beihang University (former Beijing University of Aeronautics and Astronautics), Beijing, China

M.S., Aircraft Design Sep 2012 to Jun 2015

- Advisor: Prof. Yunfeng Dong

B.S., Aircraft Design & Engineering Sep 2008 to Jun 2012

PUBLICATIONS

1. **Heng Shi**, Jihong Zhu, Xiaming Yuan, et al. "Research on Intercepting Strategy of Multiple Kill Vehicle in Midcourse Defense Based on Multi-Sensors Fusion Method". *IFAC-PapersOnLine*, 50(1): 15032-15037, 2017. (IFAC 2017, **Oral Presentation**)
2. **Heng Shi**, Jihong Zhu. "Trajectory Planning of Approaching Non-cooperative Targets Based on Gauss Pseudospectral Method". *Advances in the Astronautical Sciences*. 160(1): 1527-1538, 2017. (27th AAS/AIAA Space Flight Mechanics Meeting, **Oral Presentation**)
3. **Heng Shi**, Jihong Zhu. "Research on Application Specification of Chinese Domestic Satellite Technology in Field of Intelligent Tourism". *China Satellite Navigation Conference (CSNC)*. 2017.
4. Xiaona Wei, Yunfeng Dong, Fengrui Liu, Lu Tian, Zhao Hao, **Heng Shi**. "Principal component analysis and cluster analysis based orbit optimization for earth observation satellites". *The Journal of Chongqing University-English*. 15(3): 83-94. 2016.
5. Xiaona Wei, **Heng Shi**, Lu Tian, Zhao Hao, Chunsheng Zhang. "Design and Development of a Universal Verification System for Satellite Data Management System Based on AOS". *International Conference on Instrumentation and Measurement, Computer, Communication and Control (IMCCC)*, IEEE. 2015.
6. **Heng Shi**, Yunfeng Dong. "Research on Cooperative Control of Human-Computer Interaction Tools with High Recognition Rate Based on Neural Network". *International Conference on Virtual Reality and Visualization (ICVRV)*, IEEE. 2014.

PATENTS

1. **Heng Shi**, Jihong Zhu. "A Three-dimensional Real-time Omnidirectional Guidance Law". Application No. 201810246200.3. 2018.
2. **Heng Shi**, Jihong Zhu. "A Real-time Multi-prediction Guidance Law for Aircraft Defending Missile". Application No. 201818001011.0. 2018.

RESEARCH PROJECTS	Detection and Guidance of Aircraft Active Defense System	Aug 2017 – Present
	<ul style="list-style-type: none"> • Performed computational analysis on the “Aircraft-Missile-Defender” three-body pursuit-evasion problem • Formulated MATLAB algorithms to implement the novel predictive guidance laws of the defender missile • Conducted identification of guidance law against an unknown missile • Developed a real-time digital Aircraft Active Defense simulation system using RTX, including the full-process dynamics and closed loop control of aircrafts and missiles • Collaboratively developed the 3D visual flight simulation system using Unity3D 	
	Cooperative Guidance of Multiple Kill Vehicles	Apr 2016 – Nov 2017
	<ul style="list-style-type: none"> • Designed and optimized the cooperative detection and guidance strategy • Proposed a high-accuracy position measurement method based on sensors fusion techniques • Formulated a framework to implement the dynamics simulation of vehicles by C++ • Developed the visual simulation system using OpenSceneGraph • Performed the full-process dynamics simulation of midcourse defense 	
	Modeling and Flight Control of a Flying-Wing Tailsitter	Sep 2015 – Nov 2016
	<ul style="list-style-type: none"> • Performed analysis on the simulation using Simulink • Assembled an S500 UAV and made several experiments • Worked with fellow group members and produced a Flying-Wing Tailsitter UAV • Collaboratively developed a novel active disturbance rejection control method 	
SELECT HONORS AND AWARDS	Scholarships & Honors	
	<ul style="list-style-type: none"> • Second Class of Social Work Scholarship, Tsinghua University • Dengfeng Scholarship for Travel Grant, Tsinghua University • Integrated Excellence Scholarships, Tsinghua University • China National Graduate Scholarship • Principle’s Scholarship, Beihang University • Xi’an Aircraft Industry Scholarship 	2017 2017 2016 2014 2014 2013
	Awards	
	<ul style="list-style-type: none"> • Advanced Individual in Social Practice, Tsinghua University • Outstanding Graduates in Beijing • Excellent Postgraduate, Beihang University 	2017 2015 2015
ACTIVITIES	<ul style="list-style-type: none"> • Teaching Assistant, Introduction to Intelligent Unmanned System • Team Leader, Tsinghua Doctoral Social Practice Team to Urumqi • Monitor, SY12152, Beihang University • President, Bluesky Volunteers’ Association of BUAA 	2017 Winter 2016 Summer 2012 to 2015 2009 to 2010
SKILLS	<ul style="list-style-type: none"> • Programming: C, C++, C#, MATLAB, L^AT_EX • Tools: Photoshop, 3ds Max, Keyshot, OpenSceneGraph, RTX, Git, Prezi 	
HOBBIES	Running(5-time marathon finisher), Soccer, Ski, Badminton, Traveling	