Jianhua WANG

Final Year, Automation and Reinforcement learning

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EDUCATION BACKGROUND

Sept. 2019 – Jun. 2021 *(Ongoing)*	**Centrale Pékin, Beihang University. Master's Degree in Industrial Engineering** Research Major: Cooperative control and reinforcement learning Master Thesis: *Formation tracking control for multi-UAV systems with a dynamic leader*
Sept. 2014 – Jun. 2018	**Centrale Pékin, Beihang University. Bachelor's Degree in Applied Mathematics**
Sept. 2017 – Jun. 2018	**ESTACA, France. Specialty in Aeronautics and Aerospace, Exchange Semester**
Jun. 2014	**College Entrance Examination, Shandong. Grade: 688/750, top 0.7‰**

PUBLICATIONS

- **Journals**
  1. **Jianhua Wang**, Liang Han *et al.* Time-varying formation of second-order discrete-time multi-agent systems under non-uniform communication delays and switching topology with application to UAV formation flying. *IET Control Theory & Applications*, 14(14):1947–1956, 2020. Experiment video. https://doi.org/10.1049/iet-cta.2020.0183.
  2. **Jianhua Wang**, Liang Han *et al.* Distributed sliding mode control for time-varying formation tracking of multi-UAV system with a dynamic leader. *Aerospace Science and Technology*, 2020. Simulation video. | Under major review.
- **Conferences**
  3. **Jianhua Wang**, Liang Han *et al.* Time-varying formation of double-integrator discrete-time multi-agent systems with switching topology and time-delay. In *2019 Chinese Automation Congress (CAC)*, pages 3571–3576, IEEE, 2019. https://doi.org/10.1109/CAC48633.2019.8997391.
  4. **Jianhua Wang**, Liang Han *et al.* Bipartite antagonistic time-varying formation tracking for multi-agent system. In *2019 Chinese Control Conference (CCC)*, pages 6118–6123, IEEE, 2019. https://doi.org/10.23919/ChiCC.2019.8866328.
  5. **Jianhua Wang**, Fei Liu *et al.* Formation tracking control for second-order nonlinear multi-agent system with unknown maneuvering leader. In *2020 Chinese Automation Congress (CAC)*, IEEE, 2020.
- **Patent**
  6. A formation tracking control method based on discrete-time sliding mode control structure Patent number: 202010419920.2 | Preliminary examination passed.

RESEARCH

Research on multi-UAV formation tracking control technologies and applications

Supported by National Natural Science Foundation of China Oct. 2017 – Jun. 2020

- Design of the multi-UAV cooperative formation tracking controller.
- Verification of the controller's stability via Matlab and Simulink simulations.
- Development of a multi-UAV formation experimental platform based on the indoor positioning system. Video

Research on multi-train dynamic formation control method based on virtual coupling frame

Supported by Beijing Natural Science Foundation Nov. 2018 – Jun. 2020

- Survey of cooperative technologies in the field of urban rail transit and redaction of the fund project application.
- Design of the multi-train formation tracking control protocols under multiple constraints like switching topologies and time-delays.

- Construction of a multi-train formation demonstration platform based on Lego EV3. Video

PROJECTS

Trace explosive detection method based on multi-UAV formation

Suzhou Weimu Intelligent System Co., Ltd | May 2020 – Nov. 2020 | Suzhou, China

- Construction of the trace explosive detection scenario in the Gazebo world.
- Development of the reinforcement learning algorithm based on tabular dynamic Q-learning method.
- Achievement of the trace explosive detection by using the multi-UAV intelligent formation algorithms. Video

Automatic sample injection and result recognition device

Suzhou Weimu Intelligent System Co., Ltd | Oct. 2018 – Jun. 2019 | Beijing, China

- Utilization of vacuum suction table to draw the test paper and avoid the contamination.
- Contruction of the Raspberry Pi control center including servo control and result recognition programs. Video

Modeling and simulation of wind turbines

ESTACA (Saint-Quentin-en-Yvelines) | Oct. 2017 – Dec. 2017 | Paris, France

- Construction of the wind turbine's 3D model by using CATIA V5.
- Analyses of the paddle's stress and strain, and improvement of the paddle's configuration.

EXPERIENCES

Tutor for P2018 freshmen

Centrale Pékin, Beihang University | Sep. 2018 – Jun. 2019 | Beijing, China

- Organization of the team-building activities and guidance on their college life.
- Explanation of the basic knowledge of UAV automatic control.

Volunteer at rural summer camps

Enjoy Volunteering | May. 2015 – Oct. 2016 | Beijing, China

- Responsible for preparing educational games and picture book reading activities for children. Details

TECHNICAL SKILLS

- Advanced knowledge: Matlab | LaTeX | Ubuntu | ROS
- Intermediate knowledge: Python | Gazebo | Java | CATIA | Visio

LANGUAGES

- Chinese: Mother tongue
- English: Fluent CET-6
- French: Fluent DALF C1

HONORS

Merit Student of Beihang University	2020
National Scholarship for Postgraduate Students (1%)	2019
Student Medal of Ecole Centrale de Pekin (1%)	2019
Beihang Excellent Student Cadre (3%)	2019
Voluntary Practice Star of Ecole Centrale de Pekin (1%)	2018
Beihang Postgraduate Freshmen Admission Scholarship (5%)	2018

HOBBIES

- Basketball, table-tennis, swimming, badminton, bodybuilding, bicycle
- Reading, photography, watching documentaries