

Baoqian Wang

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Birth Date: Aug. 1995

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EDUCATION

- **University of California-San Diego & San Diego State University** California, USA
Ph.D. in Electrical and Computer Engineering; Overall GPA: 3.83 Aug. 2019 – present
- **Texas A&M University-Corpus Christi** Texas, USA
M.S. in Computer Science; Overall GPA: 3.83 Aug. 2017 – Aug. 2019
- **Yangtze University** Wuhan, China
B.E. in Prospecting Technology and Engineering; Overall GPA: 3.9 Aug. 2013 – Jul. 2017

RESEARCH EXPERIENCE

- **University of California San Diego** San Diego, CA
Research Assistant Sep. 2019 - present
 - **Coding for Distributed Multi-Agent Deep Reinforcement Learning:** In this project, we proposed a coded distributed learning framework to mitigate straggler effects for distributed multi-agent deep reinforcement learning. In particular, we use deep neural networks to approximate the policy of each agent, which is trained based on rewards received from interacting with environment. The training process of deep neural networks can be accelerated by using our framework while achieving high training accuracy.
- **San Diego State University** San Diego, CA
Research Assistant Sep. 2019 - present
 - **Deep Reinforcement Learning-Based UAV Trajectory Planning in Unknown Environment:** In this project, we investigate deep reinforcement learning algorithms for small UAVs trajectory planning in unknown environment under wind disturbances. In particular, we use LSTM with fully connected layers to construct a neural network model that takes sensing information as inputs, and outputs UAV actions. The trained model can enable UAVs to avoid both dynamic and static obstacles in the environment.
 - **Coded Distributed Computing Over Heterogeneous Computing Cluster:** In this project, we developed a new coded distributed computing framework for heterogeneous computing clusters, which can increase the robustness of the distributed computing system and accelerate the computation. The framework can be used to speed up training of machine learning algorithms such as linear regression and neural networks.
- **Texas A&M University-Corpus Christi** Corpus Christi, Texas
Research Assistant Aug. 2017 - Aug. 2019
 - **UAV Trajectory Modeling using Neural Networks:** In this project, we investigate neural networks to model the trajectories of small UAS. We implement two types of neural network models including standard dense neural network and LSTM model, which are trained using large amount of simulation data generated by physical models and small amount of real data to capture the dynamics of UAS efficiently and accurately.
 - **Develop an Open Networked Airborne Computing Platform:** In this project, we aim to develop an Unmanned Aerial Systems (UAS)-based networked airborne computing platform. We chose Jetson TX2 as the onboard computing unit for the airborne computing platform and adopt virtualization techniques to manage computing resources and to increase system security. Computationally intensive applications such as YOLOv3 object detection and other deep learning based object detection algorithms are implemented to run onboard in real time.

ADVISING ACTIVITY

- **2020 IEEE/ASME International Conference on Advanced Intelligent Mechatronics**
Advisor April. 2020 - June. 2020
 - **Undergraduate Competition:** Our project "Vision-based Autonomous Driving Robot Capable of Navigating in Unknown and Dynamic Rural Environments" wins the **Special Track on Networked Computer on the Edge Award**. In this project, we developed a modular, intelligent, and autonomous driving robot that is not only capable of navigating in a known urban environment, but also in an unknown and dynamic rural environment with unpaved roads, which is achieved by a deep reinforcement learning algorithm, namely GA3C.

TEACHING EXPERIENCE

- **San Diego State University**

San Diego, CA

Teaching Assistant

Aug. 2019 - Jan. 2020

- **EE600 Seminar: Machine Learning-2019 Fall:** Help grade the assignments, projects, exams. Teach two lectures for the course.

PUBLICATIONS

- Journals

1. **B. Wang**, J. Xie, K. Lu, Y. Wan, S. Fu, “On Batch-Processing Based Coded Computing for Heterogeneous Distributed Computing Systems”, **arXiv preprint arXiv:1912.12559**.
2. **B. Wang**, J. Xie, S. Li, Y. Wan, Y. Gu, S. Fu, K. Lu, “Computing in the Air: An Open Airborne Computing Platform”, **IET Communications**, Vol.14, pp. 2410-2419, 2020.
3. J. Xie, Y. Wan, **B. Wang**, S. Fu, K. Lu, “A Comprehensive 3-Dimensional Random Mobility Modeling Framework for Airborne Networks”, **IEEE Access**, Vol.6, pp. 22849-22862, 2018.

- Conferences

4. **B. Wang**, J. Xie, N. Atanasov, “Coding for Distributed Multi-Agent Reinforcement Learning”, **2021 International Conference on Robotics and Automation (ICRA)**.
6. **B. Wang**, J. Xie, K. Lu, Y. Wan, S. Fu “Multi-Agent Reinforcement Learning Based Coded Computation for Mobile Ad Hoc Computing”, **2021 International Conference on Communications (ICC)**.
5. C. Douma, **B. Wang**, “Coded Distributed Path Planning for Unmanned Aerial Vehicles”, **accepted by 2021 AIAA Aviation Forum**.
7. **B. Wang**, J. Xie, “Data-Driven Multi-UAV Navigation in Large-Scale Dynamic Environment Under Wind Disturbances”, accepted by **2021 AIAA Scitech Forum**.
8. **B. Wang**, J. Xie, Y. Wan, G. A. G. Reyes, L. R. G. Carrilo, “3-D Trajectory Modeling for Unmanned Aerial Vehicles” in **Proceedings of AIAA Scitech**, San Diego, CA, January 2019.
9. **B. Wang**, J. Xie, K. Lu, Y. Wan, “Coding for Heterogeneous UAV-based Networked Airborne Computing”, in **Proceedings of the IEEE GLOBECOM Workshop on Computing-Centric Drone Networks**, Waikoloa, HI, 2019.
10. **B. Wang**, J. Xie, S. Li, Y. Wan, S. Fu, K. Lu, “Enabling High-Performance Onboard Computing with Virtualization for Unmanned Aerial Systems” in **Proceedings of 2018 International Conference on Unmanned Aircraft Systems (ICUAS)**, Dallas, TX, June 2018.

PRESENTATIONS

1. “Enabling High-Performance Onboard Computing with Virtualization for Unmanned Aerial Systems”, *presented at 2018 International Conference on Unmanned Aircraft Systems (ICUAS)*, Dallas, TX, June 2018.
2. “Enabling High-Performance Onboard Computing with Virtualization for Unmanned Aerial Systems”, *presented at 15th Annual Pathways Student Research Symposium*, Canyon, TX, November 2018.
3. “3-D Trajectory Modeling for Unmanned Aerial Vehicles”, *presented at AIAA Scitech*, San Diego, CA, January 2019.
4. “Coding for Heterogeneous UAV-based Networked Airborne Computing”, *presented at IEEE Globecom Workshop*, Waikoloa, HI, December, 2019.

5. “Data-Driven Multi-UAV Navigation in Large-Scale Dynamic Environment Under Wind Disturbances”, *presented at AIAA Scitech*, Virtual, January, 2021.
6. “Multi-Agent Reinforcement Learning Based Coded Computation for Mobile Ad Hoc Computing”, *presented at 2021 International Conference on Communications*, Virtual, May, 2021.
7. “Coding for Distributed Multi-Agent Reinforcement Learning”, *presented at 2021 International Conference on Robotics and Automation (ICRA)*, Virtual, June, 2021.

REVIEW ACTIVITIES

- Reviewer of Journal
 - * *IEEE Access*
- Reviewer of Conferences
 - * *2018 International Conference of on Unmanned Aircraft Systems (ICUAS)*
 - * *2018 International Conference on Data Intelligence and Security (ICDIS)*
 - * *2019 American Control Conference (ACC)*
 - * *2020 American Control Conference (ACC)*
 - * *2020 International Conference on Automation and Control (ICCA)*

AWARDS AND SCHOLARSHIPS

- **SDSU Graduate Fellowship (\$25,000) (Jun. 2021)**
- **SDSU Graduate Travel Fund (\$1000) (Oct. 2019)**
- **President’s International Excellence Scholarship Award (\$3000) (Sep. 2018)**: The first class scholarship for international students in Texas A&M University-Corpus Christi.
- **National Scholarship (RMB 8000) (Oct. 2016)**: A scholarship given to top 1% students in each university in China for their great academic performance.
- **Wang Tao Talent Scholarship (RMB 10000) (Oct. 2015)**
- **China National Petroleum Corporation Scholarship (RMB 6000) (Oct. 2014)**

SKILLS

- **Tools**: Git, Amazon EC2, Docker, ROS, Matlab Simulink, Android Studio
- **Programming Languages**: Python (Libraries: tensorflow, pytorch, mpi4py, etc.), C++/C, Matlab, Shell, Latex, Android Java, html

LANGUAGES

- Chinese
- English