Baoqian Wang

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EDUCATION

University of California, San Diego   Aug. 2019 – Dec. 2022
Ph.D. in Electrical and Computer Engineering; Overall GPA: 3.83/4   La Jolla, CA

San Diego State University   Aug. 2019 – Dec. 2022
Ph.D. in Electrical and Computer Engineering   San Diego, CA

Texas A&M University, Corpus Christi   Aug. 2017 – May 2019
M.S. in Computer Science; Overall GPA: 3.82/4   Corpus Christi, TX

Yangtze University   Aug. 2013 – May 2017
B.S. in Exploration Geophysics; Overall GPA: 3.9/4   Wuhan, China

SKILLS

Knowledge :Deep Learning, Reinforcement Learning, Numerical Optimization, Planning and Control, Computer Vision.
Programming languages : Python (tensorflow, pytorch, scikit-learn, mpi4py, etc.), C/C++, Matlab, Java, Latex, HTML
Tools : Github, AWS, ROS, Matlab Simulink, Docker, KVM, Android Studio.

WORK EXPERIENCE

University of California, San Diego   Mar. 2020 – Present
Research Assistant   La Jolla, CA

San Diego State University   Jan. 2020 – Present
Research Assistant   San Diego, CA

San Diego State University   Aug. 2019 – Dec. 2019
Teaching Assistant   San Diego, CA

Texas A&M University, Corpus Christi   Sept. 2017 – Aug. 2019
Research Assistant   Corpus Christi, TX

PROJECTS

Scalable and Efficient Multi-Agent Reinforcement Learning (MARL)   Mar. 2020 – Present
NSF and DCIST funded project

- Developed an efficient and scalable MARL algorithm (DARL1N) that can significantly improve the training efficiency for large scale multi-agent applications.
- Investigated coding theory to improve robustness of distributed computing for MARL.

Deep Reinforcement Learning-based Multi-UAV Navigation   Aug. 2020 – Dec. 2020
NSF funded project

- Implemented A* algorithm for path planning and deep reinforcement learning algorithm (GA3C) for waypoints navigation in large scale dynamic environment.
- Developed a multi-resolution search and query algorithm to leverage historical solutions for efficient path planning.

Vision-based Autonomous Driving Robot   Feb. 2020 – May 2020
Student competition in 2021 IEEE/ASME AIM.

- Developed an autonomous driving framework that enables mobile robot navigation in environment with dynamic obstacles.
- Conducted simulation using ROS and Gazebo as well as experiments on a mobile robot to test autonomous driving performance in various environments.

Speed Up Machine Learning with Coded Distributed Computing   Jan. 2020 – Jul. 2021
NSF CAREER funded project

- Developed a novel coded distributed computing framework to speed up large scale matrix multiplication computation in machine learning algorithms such as linear regression, data shuffling.
- Conducted large size matrix multiplication computation experiments on Amazon EC2.

Deep Learning-based Trajectory Modeling for Unmanned Aerial Vehicles (UAVs)   Jan. 2019 – Sept. 2019
NSF EAGER funded project

- Investigated a comprehensive 3-D mobility model to capture movements of aircrafts.
- Combined deep learning-based model (LSTM) and physical model for UAV trajectory modeling.

Enabling High Performance Onboard Computing with Virtualization for UAVs   Sept. 2017 – Dec. 2018
NSF funded project.

- Implemented virtualization technique including KVM and Docker on Jetson TX2 to improve computing performance, security and flexibility for UAVs.

Publications

- **B. Wang**, J. Xie, N. Atanasov, "*DARL1N: Distributed multi-Agent Reinforcement Learning with One-hop Neighbors*", submitted to **The 31st International Joint Conference on Artificial Intelligence (IJCAI)**, Jan, 2022.
- B. Zhou, J. Xie, **B. Wang**, "*Dynamic Coded Convolution with Privacy Awareness for Mobile Ad Hoc Computing*", submitted to **International Conference on Communications (ICC)**, Dec. 2021.
- **B. Wang**, J. Xie, K. Lu, Y. Wan, S. Fu, "*On Batch-Processing Based Coded Computing for Heterogeneous Distributed Computing Systems*", **IEEE Transactions on Network Science and Engineering**, Vol.8, pp:2438-2454, 2021.
- **B. Wang**, J. Xie, N. Atanasov, "*Coding for Distributed Multi-Agent Reinforcement Learning*", **2021 International Conference on Robotics and Automation (ICRA).**
- D. Wang, **B. Wang**, J. Zhang, K. Lu, J. Xie, Y. Wan, S. Fu, "*CFL-HC: A Coded Federated Learning Framework for Heterogeneous Computing Scenarios*", **2021 IEEE Global Communications Conference (Globecom).**
- **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).**
- C. Douma, J. Xie, **B. Wang**, "*Coded Distributed Path Planning for Unmanned Aerial Vehicles*", **2021 AIAA Aviation Forum.**
- **B. Wang**, J. Xie, J. Chen, "*Data-Driven Multi-UAV Navigation in Large-ScaleDynamic Environment Under Wind Disturbances*", **2021 AIAA Scitech Forum.**
- **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.
- **B. Wang**, J. Xie, Y. Wan, G. A. G. Reyes, L. R. G. Carrilo, "*3-D Trajectory Modeling for Unmanned Aerial Vehicles*", **2019 AIAA Scitech Forum.**
- **B. Wang**, J. Xie, K. Lu, Y. Wan, "*Coding for Heterogeneous UAV-based Networked Airborne Computing*", **2021 IEEE Global Communications Conference (Globecom) Workshop.**
- **B. Wang**, J. Xie, S. Li, Y. Wan, S. Fu, K. Lu, "*Enabling High-Performance Onboard Computing with Virtualization for Unmanned Aerial Systems*", **2018 International Conference on Unmanned Aircraft Systems (ICUAS).**
- 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.

AWARDS AND SCHOLARSHIPS

- SDSU Graduate Fellowship   Jun. 2021
- SDSU Graduate Travel Fund   Oct. 2020
- President's International Excellence Scholarship   Sept. 2018
- National Scholarship   Oct. 2016
- Wang Tao Talent Scholarship   Oct. 2015
- China National Petroleum Corporation Scholarship   Oct. 2014