

Wang Boyu

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EDUCATION

Doctor of Philosophy (Ph.D.), Geography , University at Buffalo, United States	Jan 2022 – present
Master of Science (M.Sc.), Physics , National University of Singapore, Singapore	Aug 2013 – May 2015
Bachelor of Science (B.Sc.), Physics , National University of Singapore, Singapore	Aug 2006 – Dec 2010

PUBLICATIONS

- Chen, Q., Wang, B., & Crooks, A. (2024) Community Resilience to Wildfires: A Network Analysis Approach by Utilizing Human Mobility Data. *Computers, Environment and Urban Systems*, 110, 102110. <https://doi.org/10.1016/j.compenvurbsys.2024.102110>
 - Wang, B. & Crooks, A. (2023). Agent-Based Modeling of Consumer Choice by Utilizing Crowdsourced Data and Deep Learning (Short Paper). In *Proceedings of the 12th International Conference on Geographic Information Science (GIScience 2023)* <https://doi.org/10.4230/LIPICs.GIScience.2023.81>
 - Wang, B., Hess, V., & Crooks, A. (2022). Mesa-Geo: A GIS Extension for the Mesa Agent-Based Modeling Framework in Python. In *Proceedings of the 5th ACM SIGSPATIAL International Workshop on GeoSpatial Simulation* (pp. 1-10). <https://doi.org/10.1145/3557989.3566157>
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PEER REVIEW EXPERIENCE

Journal of Open Source Software	2024
Environment and Planning B: Urban Analytics and City Science	2023

WORK EXPERIENCE

University at Buffalo	United States
Graduate Research Assistant	Jan 2022 – present
<ul style="list-style-type: none">• Focus on applying machine learning methods in and for agent-based modeling (ABM) and geographic information science (GIScience).• Contribute to and maintain <i>Mesa-Geo</i>, an open-source GIS extension for the Mesa agent-based modeling framework in Python.	

Hewlett Packard Enterprise	Singapore
Senior Data Scientist, APAC Innovation Center	Jan 2020 – Jan 2022
<ul style="list-style-type: none">• Work independently in a team of 9 data scientists, conducting use-case driven applied research.• Implement fusion algorithms to combine object detection results from multiple deep learning models.• Estimate bounding box size and location based on drone telemetry and camera calibration data.• Develop YOLOv5 and SlowFast models for real-time human action detection from aerial view video.• Create visualizations of high dimensional vaccine trial data using t-SNE and GMM clustering methods.• Develop a federated learning use-case on highly imbalanced credit card fraud data, with a comparison of model performance to centralized neural network and XGBoost models.• Conduct interviews and participate in the hiring of data scientist candidates.	

TUMCREATE Ltd.	Singapore
Lead R&D Engineer, Project SPEEDCARGO	Oct 2017 – Jan 2020
<ul style="list-style-type: none">• Software engineering<ul style="list-style-type: none">◦ Lead the design and development of a core planning service in C++.◦ Define, implement and maintain RESTful API interfacing frontend applications.◦ Write CI/CD pipelines using Ansible, Docker and Jenkins.• Research<ul style="list-style-type: none">◦ Review and prototype heuristic and meta-heuristic methods of real-world discrete optimization problems.◦ Write R and Python packages in C++ interfacing core planning library to facilitate performance analysis.◦ Collect benchmark datasets for performance comparison of different methods.• Management<ul style="list-style-type: none">◦ Manage the technology development and implementation for one of the three main products.◦ Manage a remote outsourcing team and successfully deliver two minimum viable products.◦ Mentor junior software developers and interns.◦ Conduct interviews and participate in the building of team from 4 to 10+ members.	

- Singapore-MIT Alliance for Research and Technology (SMART) Centre** Singapore
Research Engineer, Center for Environmental Sensing and Modeling (CENSAM) Sep 2016 – Sep 2017
- Work independently in a team of three researchers, reporting to Research Scientist.
 - Research spectrum separation algorithms to identify merged peaks for LED induced fluorescence signals.
 - Design and implement a multi-platform desktop C++ GUI application for real-time data processing.
 - Build a testing environment to simulate data acquisition using Docker.
 - Maintain and support a legacy C++ ARM based embedded application.
- Cognizant Technology Solutions** Singapore
Software Engineer Sep 2015 – Sep 2016
- Perform the role of Agile developer in a Scrum team of 7 people.
 - Work in a team of 9 Appian developers on back-end business process management (BPM) application, and collaborate with 10+ front-end Ruby on Rails developers.
 - Develop Java plug-ins for Appian applications, and implement the interfacing with other data systems.
 - Implement SOAP web services and manage assets in both business layer and persistence layer.
 - Write stored procedures, functions and packages with Oracle PL/SQL.
 - Troubleshoot software defects and deliver bug fixes.
- Apple Inc.** Singapore
QA Tester Mar 2013 – Aug 2013
- Involve in user acceptance testing (UAT) of software development projects.
 - Execute testing scripts to ensure software functionality, performance, reliability and stability.
 - Identify and review with global cross-functional teams on functional, linguistic and localization issues.
 - Receive WOW Award: Thinking Outside Of The Box.
- AppleCare Advisor** Nov 2011 – Feb 2013
- Provide remote first level support to Apple customers.
 - Promote Apple hardware, software and service offerings.

CONFERENCE PRESENTATIONS & TALKS

- **Boyu Wang** and Andrew Crooks. “Simulating Urban Flow with Geographically Explicit Synthetic Population”, AAG Annual Meeting, Honolulu, HI, USA. *Apr 20, 2024*
- Thomas Pike, Jacqueline Kazil and **Boyu Wang**. “Mesa, Agent-Based Modeling in Python”, AAG Annual Meeting, Honolulu, HI, USA. *Apr 16, 2024*
- **Boyu Wang** and Andrew Crooks. “Do People Care About Others’ Opinions of Places? Utilizing Deep Learning to Model Peoples’ Review Patterns”, AAG Annual Meeting, Denver, CO, USA. *Mar 25, 2023*
- Qingqing Chen, **Boyu Wang** and Andrew Crooks. “Community Resilience to Wildfires: A Network Analysis Approach by Utilizing Human Mobility Data”, AAG Annual Meeting, Denver, CO, USA. *Mar 25, 2023*
- **Boyu Wang** and Andrew Crooks. “Mesa-Geo: A GIS Extension for the Mesa Agent-Based Modeling Framework in Python”, 5th ACM SIGSPATIAL International Workshop on GeoSpatial Simulation, Seattle, WA, USA. *Nov 1, 2022*

HONORS & AWARDS

- Best Paper Award, 5th ACM SIGSPATIAL International Workshop on GeoSpatial Simulation (GeoSim 2022)
- Travel Grant Award, 30th ACM SIGSPATIAL International Conference on Advances in Geographic Information Systems (ACM SIGSPATIAL 2022)
- Government-Linked Company Undergraduate Scholarship (SM3), Ministry of Education, Singapore, 2006

CERTIFICATES

DeepLearning.AI Generative Adversarial Networks (GANs) Specialization, Coursera	Jan 2022
DeepLearning.AI TensorFlow Developer Specialization, Coursera	Jan 2021
Dataiku DSS Certified User L2, Dataiku	May 2020
Probabilistic Graphical Models Specialization, Coursera	Apr 2020
Dataiku DSS Certified User L1, Dataiku	Apr 2020
Data Scientist with Python, DataCamp	Jun 2019
Deep Learning Nanodegree, Udacity	Aug 2018
Machine Learning, Coursera	Feb 2016
Appian Certified Application Designer, Appian Corporation	Jan 2016 – Jul 2017
Appian Certified Application Analyst, Appian Corporation	Dec 2015 – Jun 2017

SKILLS

PROGRAMMING

R, Python, C++, SQL, MATLAB, Mathematica, Java

FRAMEWORKS & PACKAGES

Tidyverse, Pandas, Scikit-Learn, Seaborn, PyTorch, Keras, TensorFlow, MLflow, Qt, ROS

PLATFORMS & TOOLS

Ansible, Appian, ArcGIS Pro, Bash, Dataiku DSS, Docker, Git, Jenkins, Linux

LANGUAGES

English (Fluent), Mandarin (Native)