

# Wei Guo

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## WORK EXPERIENCE

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**Amazon**, Arlington, VA June 2023 - present  
*Applied Scientist*

- Worked on Fintech and large language models.

## EDUCATION

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**George Washington University**, Washington, DC Aug. 2019 - May 2023  
Ph.D. in Computer Science  
Advisor: Dr. Peng Wei, Dr. Robert Pless

**University of Virginia**, Charlottesville, VA Aug. 2016 - Dec. 2018  
M.E. in Computer Engineering

**East China Normal University**, Shanghai, China Sept. 2012 - May 2016  
B.S. in Statistics

## INTERN EXPERIENCE

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**Amazon**, Seattle, WA May 2022 - Aug. 2022  
*Applied Scientist Intern*

- Developed an end-to-end deep learning model for anomaly detection.
- Conducted extensive feature engineering to ensure model reliability and robustness.
- Collaborated with cross-functional teams to integrate model into company system.

**eBay**, Shanghai, China Apr. 2016 - Aug. 2016  
*Data Analyst Intern*

- Designed, tracked, and evaluated a large-scale seller promotion program.
- Provided analyses by composing complex SQL queries from large data warehouses.

## RESEARCH EXPERIENCE

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**George Washington University**, Washington, DC July 2020 - present

- Performed research on safe and trustworthy deep reinforcement learning for multiple agents. A demo is available [here](#).
- Developed an explainable deep reinforcement learning model for autonomous collision avoidance systems. A demo is available [here](#).
- Designed a safety validation framework for deep reinforcement learning models based on a novel multi-agent formulation. A demo is available [here](#).
- Designed and implemented safe real-time motion planning and collision avoidance algorithms for autonomous aircraft in crowded and uncertain environments.

- Leading a technical task in a \$2.5M NASA project of developing in-time learning-based aviation safety management system (ILASMS) for scalable advanced air mobility (AAM) operations.
- Developing model-based partially observable Markov decision process (POMDP) algorithm and codebase with Deep Variational Reinforcement Learning.

George Washington University, Washington, DC

Aug. 2019 - June 2020

- Designed and implemented two algorithms to detect the semantic biases in static word embeddings.
- Designed a novel measurement of semantic bias in contextualized word embedding and constructed experiments to validate the algorithm in Elmo, Bert, GPT and GPT-2. The codebase is [here](#).

University of Virginia, Charlottesville, VA

Jan. 2018 - June 2018

- Designed algorithms for the thermal spray operation agent with Deep Reinforcement Learning.
- Built the simulation environment for thermal spray operation agent and implemented the algorithm.

## PUBLICATIONS

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### *Conference Publications*

1. **W. Guo**, M. Brittain, P. Wei “Safety Validation for Deep Reinforcement Learning Based Aircraft Separation Assurance with Adaptive Stress Testing”, Digital Avionics Systems Conference (DASC), Barcelona, Spain, Oct. 2023. [\[Link\]](#)
2. **W. Guo**, P. Wei “Explainable Deep Reinforcement Learning for Aircraft Separation Assurance”, Digital Avionics Systems Conference (DASC), Portsmouth, VA, Sept. 2022. [\[Link\]](#)
3. E. L. Thompson, A. G. Taye, **W. Guo**, P. Wei, M. Quinones-Grueiro, I. Ahmed, G. Biswas, J. Quattrociochi, S. Carr, U. Topcu, J. Jones, M. Brittain “A Survey of eVTOL Aircraft and AAM Operation Hazards”, AIAA AVIATION 2022 Forum, Chicago, IL, Jun. 2022. [\[Link\]](#)
4. **W. Guo**, M. Brittain, P. Wei “Safety Enhancement for Deep Reinforcement Learning in Autonomous Separation Assurance”, IEEE Intelligent Transportation Systems Conference (ITSC), Indianapolis, IN, Sept. 2021. [\[Link\]](#)
5. **W. Guo** and A. Caliskan, “Detecting Emergent Intersectional Biases: Contextualized Word Embeddings Contain a Distribution of Human-like Biases”, AAAI/ACM Conference on AI, Ethics, and Society (AIES), virtual conference, May 2021. [\[Link\]](#) [\[Oral Presentation\]](#)
6. A. Toney, A. Pandey, **W. Guo**, D. Broniatowski, A. Caliskan, “Automatically Characterizing Targeted Information Operations Through Biases Present in Discourse on Twitter”, International Conference on Semantic Computing (ICSC), virtual conference, Jan. 2021. [\[Link\]](#)

### *Journal Publications*

7. **W. Guo**, Y. Zhou, P. Wei, “Exploring online and offline explainability in deep reinforcement learning for aircraft separation assurance”, *Frontiers in Aerospace Engineering*: 1071793, 2022.
8. **W. Guo**, K. Wang, “Analysis on the Satisfaction of Farmers to the Construction of High Standard Farmland in 12th Five-year: Case of a Town in Shanghai City”, *Journal of Agrotechnical Economics*: 39–45, 2016.

### *Preprints*

9. R., Pouria, A. Tabrizian, **W. Guo**, S. Chen, A. Taye, E. Thompson, A. Bregeon, A. Baheri, and P. Wei. “A survey on reinforcement learning in aviation applications.” arXiv preprint arXiv:2211.02147 (2022). [\[Link\]](#)

10. A. Toney, A. Pandey, **W. Guo**, D. Broniatowski, A. Caliskan, “Pro-Russian Biases in Anti-Chinese Tweets about the Novel Coronavirus”, 2020. [\[Link\]](#)

## SKILLS

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Reinforcement Learning, Deep Learning, Natural Language Processing, Anomaly Detection, Convex Optimization

Python (TensorFlow, PyTorch), Java, Scala, HTML, JavaScript, R, Matlab

## SELECTED COURSEWORK

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Machine Learning  
Convex Optimization

Data Mining

Regression Analysis

Mathematical Statistics

Computer Vision (online)

Reinforcement Learning

Autonomous Mobile Robots

Multivariate Statistics

Time Series

Probability Theory

Deep Learning (online)