

# WEIDONG ZHANG

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## EDUCATION

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**Incoming PhD Student in CS**, Simon Fraser University, Burnaby, Canada      Expected start: September, 2026  
Advisor: **Prof. Marzena Karpinska**

**MS in Data Analytics Engineering**, Northeastern University, Vancouver, Canada      December, 2024  
GPA: 3.92/4.00

Coursework: *Data Mining in Engineering, Database Management Systems, Statistical Methods in Engineering, Deterministic Operations Research, Computation and Visualization for Analytics*

**Bachelor of Economics in Finance**, University of Jinan, Jinan, China      June, 2023  
GPA: 3.91/4.00

Coursework: *Advanced Mathematics I, Advanced Mathematics II, Linear Algebra, Probability and Mathematical Statistics, Econometrics, Financial Engineering, Finance*

## PUBLICATIONS

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1. D'Alonzo, S., Chen, R. \*, **Zhang, W.** \*, Yu, M., Mangat, J., Yang, I., Ma, W., Saveski, M., Vosoughi, S., & Gillani, N. (2026). **Detecting and enhancing intellectual humility in online political discourse**. *Proceedings of the International AAI Conference on Web and Social Media (ICWSM-26)*. AAAI Press.
2. **Zhang, W.**, Jung, Y., Khaliq, M. A., Xiao, F., Chuluunbaatar, E., Lee, B. K., & Ryoo, J. (2026). **Lesion-DDPM: Lesion-Enhanced 3D Diffusion for MS MRI Synthesis**. *Proceedings of the 9th IEEE International Conference on Multimedia Information Processing and Retrieval (MIPR 2026)*. IEEE. (under review)
3. Khaliq, M. A., Jung, Y., **Zhang, W.**, Han, J., Ryoo, J., & Lee, B. K. (2026). **Performance Analysis and Optimization of 3D Generative Diffusion Models across GPU Architectures**. *Proceedings of the 17th ACM/SPEC International Conference on Performance Engineering (ICPE 2026)*. ACM.
4. Tembrevilla, G., **Zhang, W.**, Bowen, G. M., Lin, M. P. C., Montebon, D. R., & Ryoo, J. (2026). **Where are the Teachers? Rethinking AR/VR Research in Teacher Education**. *Proceedings of the Annual Conference and Exposition of the American Society for Engineering Education (ASEE 2026)*. Charlotte, NC, USA.

\* Denotes contributions of equal importance.

## RESEARCH EXPERIENCE

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**Synthetic MRI Generation for Multiple Sclerosis Using Conditional Diffusion**      Jan 2025 – Nov 2025  
Supervisors: **Prof. Jeeho Ryoo** (Fairleigh Dickinson University)      Vancouver, Canada

**Prof. Byeong Kil Lee** (University of Colorado, Colorado Springs)

- Developed "Lesion-DDPM," a novel 3D conditional diffusion model designed to synthesize high-fidelity FLAIR MRIs with a specific focus on preserving small, sparse Multiple Sclerosis (MS) lesions
- Engineered a multi-level gated condition injection mechanism within a 3D U-Net architecture to reinforce lesion context at encoder, bottleneck, and decoder stages, ensuring global anatomical coherence while maintaining local lesion details
- Implemented a lesion-weighted L1 reconstruction loss function to address severe class imbalance and prevent the over-smoothing of fine structures common in standard generative models
- Benchmarked performance against state-of-the-art baselines (3D Pix2Pix, DiscoGAN, Med-DDPM) using the MSLesSeg dataset, achieving superior reconstruction fidelity as evidenced by a lesion-region MSE of 0.048 and MS-SSIM score of 0.806
- Demonstrated the clinical utility for downstream segmentation: synthetic-only training yielded a Dice score of 0.616, and augmenting real data with synthetic scans improved the Dice score to 0.685

**Discourse Attribute Modeling and Environment Analysis Using NLP**  
Research Assistant, **Plural Connections Group**, Northeastern University  
Supervisor: **Prof. Nabeel Gillani** (in collaboration with Dartmouth College)

Jan, 2025 – Jan, 2026  
Boston, United States

- Developed a domain-adapted codebook for identifying intellectually humble and arrogant behaviors in Reddit political discourse, achieving substantial inter-rater agreement ( $\kappa = 0.63$ ) across annotators.
- Built and evaluated LLM-based classifiers for large-scale IH/IA detection, improving coarse-grained classification F1 scores to 0.74, surpassing prior benchmarks using Google’s Perspective API.
- Engineered a scalable Reddit NLP pipeline integrating BERTopic modeling and ordinal logistic regression to analyze how conversational environments influence user tone, with author and topic fixed effects.
- Conducted a randomized controlled trial ( $n = 513$ ) on a custom-built Flask + ReactJS platform to test LLM-generated “social cue” interventions that increased IH expression without reducing engagement.
- Collaborated across institutions to co-develop reproducible workflows aligned with broader project goals

## WORK EXPERIENCE

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*Diandian Technology*, **Marketing Analyst Intern**, Qingdao, China

June 2022 – Aug. 2022

- Analyzed 3 client apps’ UI, promotions, and user experiences
- Visualized insights in Tableau to support strategic decision-making
- Designed Excel templates to manage merchandise and user data, later integrated into standard workflow, increasing operational efficiency by 20%

*Ogilvy*, **Marketing Specialist Intern**, Beijing, China

Jan. 2022 – Feb. 2022

- Analyzed industry and financial reports using Tableau and Power BI to identify market trends
- Co-developed promotional strategies and marketing materials for brand campaigns
- Visualized P&G’s Double 11 campaign performance using Excel and Tableau dashboards

*Agricultural Bank of China*, **Account Executive Intern**, Qingdao, China

Jan. 2021 – Feb. 2021

- Helped unearth patterns in products sold using R and assisted in determining effectiveness of promotions
- Assisted manager to clean and identify anomaly in retail clients’ information for the past 5 years using advanced Excel, Python, and database query languages such as SQL
- Created survey to elicit feedback and understand customer needs and supported product development
- Performed customer outreach and maintained stakeholder engagement by presenting new changes in wealth management products in 5 occasions

## HONORS

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2024 & 2023 **25% Tuition Scholarship**, Northeastern University

Vancouver, Canada

2021 **Junior Year GPA Ranking No.1 (out of 96 students)**, Jinan University

Jinan, China

2021 **1st Class Academic Scholarship**, Jinan University

Jinan, China

2021 **University-Level Outstanding Student**, Jinan University

Jinan, China

## SKILLS

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- Python, R, SQL, LaTeX
- Tensorflow, Pytorch, Keras
- MacOS, Windows, Linux