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# Ziqi Xu

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## PROFESSIONAL SUMMARY

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I am a CERC Fellow at Data 61, Commonwealth Scientific and Industrial Research Organisation (CSIRO). I am working with Dr. Sevvandi Kandanaarachchi in the Analytics and Decision Sciences Group. I obtained my Ph.D. from the STEM, University of South Australia, where I was supervised by Prof. Jiuyong Li. During my Ph.D., I also worked closely with A/Prof. Jixue Liu and Prof. Lin Liu. Previously, I obtained my Master's degree from the School of Computer and Mathematical Sciences at The University of Adelaide, where I was supervised by Dr. Wei Zhang. My research interests are broadly in data mining and machine learning, with a particular focus on causal inference and fairness.

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## EDUCATION

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**PhD** in Computer Science (Major: Machine Learning), 02/2021 – 02/2024

**University of South Australia** - Adelaide, Australia

- Advisor: Prof. Jiuyong Li
- Thesis: Causal Inference with Deep Generative Models

**MSc** in Computing and Innovation, 02/2019 – 12/2020

**University of Adelaide** - Adelaide, Australia

- Advisor: Dr. Wei Zhang
- 6.125/7.0 GPA

**BEng** in Engineering, 08/2014 – 07/2018

**Liaoning Petrochemical University** - Fushun, China

- 6.23/7.0 GPA (Top 1%)
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## WORKING EXPERIENCE

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**CERC Fellow**, 02/2024 – Current

**Data61, CSIRO** - Melbourne, Australia

- Advisor: Dr. Sevvandi Kandanaarachchi
- Project: Fairness in Machine Learning

**Casual Academic Staff**, 01/2023 – Current

**University of South Australia** – Adelaide, Australia

- Advisor: A/Prof. Jixue Liu; A/Prof. Rhoda Abadia; Dr. Sisi Liu; Mr. Andres Cifuentes Bernal

**Data Analyst Intern**, 06/2022 - 12/2022 [In the Media]

**SAccommunity, Infoxchange** – Adelaide, Australia

**Full-Stack Developer Intern**, 05/2020 - 09/2020

**YNW Web and APPs** – Adelaide, Australia

- Project: Basic Trailer; KOMO Glass Trade; Zoom Mobile Skips

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## TEACHING EXPERIENCE

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### STEM, University of South Australia – Adelaide, Australia

- Lecturer, Practical Supervisor, and Marker: Relational Databases and Warehouses ([INFS 4019](#)), SP5, 2023.
- Practical Supervisor, and Marker: Database for the Enterprise ([INFS 2011](#)), SP2, 2023.

### UO, University of South Australia – Adelaide, Australia

- Tutor and Marker: UO Machine Learning ([INFT 3046](#)), SP3, 2023 & SP3, 2024.
- Tutor and Marker: UO Predictive Analytics ([INFS 3081](#)), SP6, 2023 & SP3, 2024.
- Tutor and Marker: UO Data Acquisition and Wrangling ([INFT 2067](#)), SP1, 2024.
- Tutor and Marker: UO Advanced Topics in Data Analytics ([INFS 3087](#)), SP1, 2024.
- Tutor and Marker: UO Text and Social Media Analytics ([INFS 3089](#)), SP3, 2023.
- Tutor and Marker: UO Problem Solving and Programming ([COMP 1043](#)), SP1, 4 & 6, 2023.

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## PUBLICATIONS

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(\* denotes equal contribution) [Core 2021]

- [C1] **Ziqi Xu**, Debo Cheng, Jiuyong Li, Jixue Liu, Lin Liu, and Kui Yu. Causal Inference with Conditional Front-Door Adjustment and Identifiable Variational Autoencoder. In *Proceedings of the International Conference on Learning Representations (ICLR 2024)* [Core A\*] [\[PDF\]](#)
- [C2] Debo Cheng\*, **Ziqi Xu\***, Jiuyong Li, Jixue Liu, Lin Liu, and Thuc Duy Le. Conditional Instrumental Variable Regression with Representation Learning for Causal Inference. In *Proceedings of the International Conference on Learning Representations (ICLR 2024)* [Core A\*] [\[PDF\]](#)
- [C3] Debo Cheng\*, **Ziqi Xu\***, Jiuyong Li, Jixue Liu, Lin Liu, Wentao Gao and Thuc Duy Le. Instrumental Variable Estimation for Causal Inference in Longitudinal Data with Time-Dependent Latent Confounders. In *Proceedings of the AAAI Conference on Artificial Intelligence (AAAI 2024)* [Core A\*] [\[PDF\]](#)
- [C4] **Ziqi Xu**, Debo Cheng, Jiuyong Li, Jixue Liu, Lin Liu and Ke Wang. Disentangled Representation for Causal Mediation Analysis. In *Proceedings of the AAAI Conference on Artificial Intelligence (AAAI 2023)* [Core A\*] [\[PDF\]](#)
- [C5] Debo Cheng\*, **Ziqi Xu\***, Jiuyong Li, Lin Liu, Jixue Liu and Thuc Duy Le. Causal Inference with Conditional Instruments Using Deep Generative Models. In *Proceedings of the AAAI Conference on Artificial Intelligence (AAAI 2023)* [Core A\*] [\[PDF\]](#)
- [C6] Debo Cheng\*, **Ziqi Xu\***, Jiuyong Li, Lin Liu, Thuc Duy Le and Jixue Liu. Learning Conditional Instrumental Variable Representation for Causal Effect Estimation. In *Proceedings of the Joint European Conference on Machine Learning and Knowledge Discovery in Databases (ECML-PKDD 2023)* [Core A] [\[PDF\]](#)
- [C7] **Ziqi Xu**, Jixue Liu, Debo Cheng, Jiuyong Li, Lin Liu and Ke Wang. Disentangled Representation with Causal Constraints for Counterfactual Fairness. In *Proceedings of the Pacific-Asia Conference on Knowledge Discovery and Data Mining (PAKDD 2023)* [Core A] [\[PDF\]](#)
- [C8] Tingting Xu, Yinghao Zhang, Jiuyong Li, Lin Liu, **Ziqi Xu**, Debo Cheng and Zaiwen Feng. A Data-Driven Approach to Finding K for K Nearest Neighbour Matching in Average Causal Effect Estimation. In *Proceedings of the International Conference on Web Information Systems Engineering (WISE 2023)* [Core B] [\[PDF\]](#)
- [C9] Debo Cheng\*, Yang Xie\*, **Ziqi Xu\***, Jiuyong Li, Lin Liu, Jixue Liu, Yinghao Zhang and Zaiwen Feng. Disentangled Latent Representation Learning for Tackling the Confounding M-Bias Problem in Causal

Inference. In *Proceedings of the IEEE International Conference on Data Mining (ICDM 2023)* [Core A\*]  
[PDF]

[C10] Zhenlong Xu\*, **Ziqi Xu\***, Jixue Liu, Debo Cheng, Jiuyong Li, Lin Liu and Ke Wang. Assessing Classifier Fairness with Collider Bias. In *Proceedings of the Pacific-Asia Conference on Knowledge Discovery and Data Mining (PAKDD 2022)* [Core A] [PDF]

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## PARTICIPATED RESEARCH PROJECTS

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**ARC Discovery Project (DP200101210):** Fairness aware data mining for discrimination-free decision-making.

- This project aims to develop data mining methods to detect algorithmic discriminations and to build fair decisions on models. [[Link](#)]

**ARC Discovery Project (DP230101122):** Build competency aware and assuring machine learning systems.

- This project aims to develop novel techniques to equip a ML system with the ability to identify own competency, to justify its competency and decisions, to explore unknown situations and fully utilise existing expertise to deal with unknowns. [[Link](#)]

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## HONOURS AND AWARDS

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- AAAI Student Scholarships, 2022, Association for the Advancement of Artificial Intelligence.
- University President's Scholarships (UPS), 2021, University of South Australia.
- Global Citizens Scholarship, 2020, University of Adelaide.
- Recipient of PEP Class Award, 2019, University of Adelaide.
- Guangdong - Hong Kong - Macao Scholarship, 2017, Liaoning Petrochemical University.
- China National Petroleum Corporation (CNPC) Scholarship, 2015, CNPC.

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## ACADEMIC SERVICES

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- Program committee member for ECML-PKDD 2024.
- Program committee member for UAI 2024.
- Program committee member for IJCAI 2024.
- Program committee member for 2023 KDD workshop on Causal Discovery, Prediction and Decision.
- Invited Journal Reviewer: International Journal of Data Science and Analytics.