

XUANZHI CHEN

Personal Website: <https://xuanzhichen.github.io/>

📍 Guangzhou, China ✉ xuanzhichen.42@gmail.com

G Google Scholar 🌐 github.com/xuanzhichen

INTRODUCTION

I intend to work for prospective applications in brain science, with special interests in neurotechnology and neuroscience. My practical endeavors in brain science rests on the vision of making the technical-advanced contributions — bringing hope to the people affiliated by brain disease, facilitating the ever-stronger human-computer interaction, or elevating efficiency in computational architectures with biological plausibility. Ultimately, my long-term goals in academics lies in helping better realize the intellectual cognition given rise by our brain, with the particular scientific ideation in which I incline to leverage computational methodology to simulate and unravel complex neural capabilities, and resort to theoretical mathematics in terms of the description and simplification of specific brain functions.

INTEREST AND SKILLS

FIELDS: **Neuroscience, Neurotechnology**
computational cognitive neuroscience,
neuroAI, brain-controlled robotics,
brain-computer-interface,
neuromorphic computing

METHODS: **Computational, Mathematical**
Bayesian analysis, Rough Path theory,
artificial intelligence,
machine learning

CODINGS: **Python**, PyTorch, R, MATLAB,
distributed and cluster training

EDUCATION

Guangdong University of Technology, GDUT

Bachelor of Science in Computer Science

Sep. 2020 – Jun. 2024

Guangzhou, china

Awards & Honors

GDUT Invention Patent on causal inference with fMRI data (first inventor)

2023

GDUT CS department Undergraduate Research Program project award

2021-2023

EXPERIENCE

Research Internship in Non-Linear Causal Inference

Sep. 2021 – Sep. 2023

Data Mining and Information Retrieval Lab | Advisors: [Wei Chen](#), [Ruichu Cai](#)

Guangzhou, china

- **Motivation:** Discover a potential “causal structure” entailed by generic (non-linear) raw data.
- **Hypothesis:** Presume the “structural causal asymmetry” of specific non-linear brain functions.
- **Conclusion:** Developed “hybrid-based” causal algorithms and highlighted a identification condition as to the non-linear causal inference among structural brain regions, with applications in fMRI data.

WORK

PROJECTS

A Primer on Causal Diagram Learning [\[intro link\]](#)

Sep. 2023 – Apr. 2024

Popularization of Science and Technology

- Create connections to celebrated books by leaders in causation, around topics of “causal discovery”.
- Following giants in causation, provide beneficial opinions to fields in AI and cognitive neuroscience.

Cadimulc: Light Python Package for Hybrid-Based Causal Discovery [\[intro link\]](#)

May. 2022 – Jun. 2023

Software

- CADIMULC stands for the data-driven task: CAusal Discovery with Multiple Latent Confounders.
- Provide easy-to-use APIs to learn causal graphs from generally raw data with relatively efficiency.

Nonlinear Causal Discovery from Unknown Confounding [\[intro link\]](#)

Nov. 2021 – Jun. 2023

Scientific Research

- Interest in teaching AI in brain science to appreciate “causal structures” underneath the brain data.
- Develop algorithms fitting for the complicate data involving non-linearity and unknown confounding.

PAPERS

- **Chen, X.**, 2024. A Primer on Learning Causal Graph: Interpret Causation from Causal Discovery Perspectives. In *Xuanzhi's Personal Website (Unpublished)*¹. [\[paper link\]](#)
- **Chen, X.**, Chen, W., Cai, R., 2023. Non-linear Causal Discovery for Additive Noise Model with Multiple Latent Confounders. In *Xuanzhi's Personal Website (Unpublished)*². [\[paper link\]](#)
- Liu, Y., Zhu, W., Qiao, J., Huang, Z., Xiang, Y., **Chen, X.**, Chen, W. and Cai, R., 2022. Causal Alignment Based Fault Root Causes Localization for Wireless Network. In *IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*. [\[paper link\]](#)

OTHER

Test of English as a Foreign Language (TOEFL): a score of 98, with a score of 24 in speaking (temporary score in June, 2024)

¹This unpublished paper serves as an open resource focusing on popularization of causal science, sharing Xuanzhi's personal opinions based on his research experience in causal discovery.

²This unpublished paper is a complete research work that should have been scheduled for submission in 2023, but collaboration among authors came to an early cessation, due to Xuanzhi's personal inconvenience.