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## EDUCATION

### University of Macau (UM)

Macao, China

PhD Student in Psychology (Advisor: Prof. Haiyan Wu)

2021 - present

### Sun Yat-sen University (SYSU)

Guangzhou, China

Master of Engineering in Software Engineering (Advisor: Prof. Jiaotao Ren)

2016 - 2018

◆ Thesis: Research on causal knowledge extraction method based on deep learning and sequence labelling

Bachelor of Engineering in Information Security

2012 - 2016

◆ Relevant Courses: Social Psychology, Computer Programming, Data Structure and Algorithm, Graph Theory and Its Algorithms, Principles and Applications of Artificial Intelligence

## RESEARCH INTERESTS

### Topics

◆ Social cognition, social neuroscience, mentalising, artificial social intelligence, natural language processing

### Methods

◆ Experimental design, computational modelling, fMRI, machine learning

## PEER-REVIEWED JOURNAL ARTICLES

⟨Total citations: 101, *h*-index: 3, *i10*-index: 1⟩

Note. \* indicates the corresponding author

1. Li, Z., Jiang, Q., Wu, Z., Liu, A., Wu, H., Huang, M., Huang, K. & Ku, Y.\* (in press). Towards human-compatible autonomous car: A study of non-verbal Turing test in automated driving with affective transition modelling. *IEEE Transactions on Affective Computing*. ⟨Citations: 1; JCR-Q1; 2022 JIF: 11.2⟩ [[Early Access](#)] [[arXiv](#)] [[Data & Code](#)] [[Twitter](#)] [WeChat (in Chinese): [MELab](#)] [[LinkedIn](#)] [[Mastodon](#)]
2. Li, Z., Dong, Q., Hu, B.\* & Wu, H.\* (2023). Every individual makes a difference: A trinity derived from linking individual brain morphometry, connectivity and mentalising ability. *Human Brain Mapping*, 44(8), 3343-3358. ⟨Citations: 3; JCR-Q1; 2022 JIF: 4.8⟩ [[Paper](#)] [[bioRxiv](#)] [[Data & Code](#)] [[Twitter](#)] [[Mastodon](#)] [WeChat (in Chinese): [ANDLab](#), [brainnews](#), [Wiley NeuroPsycho](#)]
3. Li, Z., Li, Q., Zou, X. & Ren, J.\* (2021). Causality extraction based on self-attentive BiLSTM-CRF with transferred embeddings. *Neurocomputing*, 423, 207-219. ⟨Citations: 92; JCR-Q2; 2022 JIF: 6.0⟩ [[Paper](#)] [[arXiv](#)] [[Data & Code](#)]
4. Li, Z. & Ren, J.\* (2020). Fine-tuning ERNIE for chest abnormal imaging signs extraction. *Journal of Biomedical Informatics*, 108, 103492. ⟨Citations: 5; JCR-Q2; 2022 JIF: 4.5⟩ [[Paper](#)] [[arXiv](#)] [[Data & Code](#)]

## CRedit Contributor Roles

Paper	Concept.	Data Cur.	Analysis	Funding	Invest.	Method.	Admin.	Resources	Software	Supervis.	Validation	Visual.	First Draft	Editing
[1]	✓ (L)	✓ (L)	✓			✓ (L)	✓ (E)	✓ (S)	✓		✓	✓ (L)	✓ (L)	✓ (L)
[2]	✓ (E)	✓ (E)	✓			✓ (L)	✓ (E)	✓ (S)	✓ (L)		✓	✓ (L)	✓ (L)	✓ (L)
[3]	✓ (L)	✓ (L)	✓		—	✓	✓ (E)	✓ (E)	✓		✓	✓	✓	✓ (L)
[4]	✓ (L)	✓	✓		—	✓	✓ (E)		✓		✓	✓	✓	✓ (L)

Note. ✓ indicates CRediT contribution role, — indicates not applicable for a given project and blanks indicate roles not undertaken. L, E and

*S indicate the degree of contribution when multiple individuals serve in the same role, i.e., lead, equal and supporting. Concept. = Conceptualisation, Data Cur. = Data Curation, Analysis = Formal Analysis, Funding = Funding Acquisition, Invest. = Investigation, Method. = Methodology, Admin. = Project Administration, Supervis. = Supervision, Visual. = Visualisation, First Draft = Writing – Original Draft, Editing = Writing – Review & Editing*

## PATENT

5. **Li, Z.** Causal knowledge extractor based on deep learning V1.0. China Patent Application 2018SR275268, Certificate No.: 2604363, filed 2018. [In Chinese: [Certificate](#), [User Manual](#), [Master's Thesis](#)]

## CONFERENCE PRESENTATIONS

*Note. Underline indicates presenter*

6. **Li, Z.**, Jiang, Q., Wu, Z., Liu, A., Wu, H., Huang, M., Huang, K. & Ku, Y.\* (2023). Bot or not: A study of the Turing test in automated driving with affective transition modelling. Poster presented virtually at *Proceedings of the 45th Annual Conference of the Cognitive Science Society*, July 26-29. [[Abstract](#)] [[Poster](#)]
7. **Li, Z.**, Jiang, Q., Wu, Z., Liu, A., Wu, H., Huang, M., Huang, K. & Ku, Y.\* (2023). Bot or not: A study of the Turing test in automated driving with affective transition modelling. Blitz topics presented and poster presented at *the 15th Annual Meeting of the Social & Affective Neuroscience Society*, Santa Barbara, United States, April 27-29. **Diversity Travel Award.** [[Abstract](#)] [[Slides](#)] [[Poster](#)] [[Video](#)]
8. **Li, Z.**, Jiang, Q., Wu, Z., Liu, A., Wu, H., Huang, M., Huang, K. & Ku, Y.\* (2022). Towards human-compatible autonomous car: A study of non-verbal Turing test in automated driving with affective transition modelling. Presented virtually at *2022 National Doctoral Forum on Brain-Computer Intelligence and Psychology*, Hangzhou, China, November 19. [[Slides](#)]
9. **Li, Z.**, Dong, Q., Hu, B.\* & Wu, H.\* (2022). Every individual makes a difference: A trinity derived from linking individual brain morphometry, functional connectivity and mentalising abilities. Presented virtually at *2022 National Doctoral Forum on Brain-Computer Intelligence and Psychology*, Hangzhou, China, November 19. **Excellent Presentation Award.** [[Slides](#)]
10. **Li, Z.**, Jiang, Q., Wu, Z., Liu, A., Wu, H., Huang, M., Huang, K. & Ku, Y.\* (2022). Towards human-compatible autonomous car: A study of non-verbal Turing test in automated driving with affective transition modelling. Poster presented at *the 3rd Macau Symposium on Cognitive and Brain Sciences*, Macao, China, November 18-19. [[Poster](#)]
11. **Li, Z.**, Dong, Q., Hu, B.\* & Wu, H.\* (2022). Every individual makes a difference: A trinity derived from linking individual brain morphometry, functional connectivity and mentalising abilities. Poster presented at *the 3rd Macau Symposium on Cognitive and Brain Sciences*, Macao, China, November 18-19. [[Poster](#)]
12. **Li, Z.**, Dong, Q., Hu, B.\* & Wu, H.\* (2022). Every individual makes a difference: A trinity derived from linking individual brain morphometry, connectivity and mentalising ability. Presented virtually at *2022 National Forum on Psychology for Excellent Doctoral Students*, Guangzhou, China, June 24-25. [[Slides](#)]
13. **Li, Z.**, Jiang, Q., Wu, Z., Liu, A., Wu, H., Huang, M., Huang, K. & Ku, Y.\* (2022). Towards human-compatible autonomous car: A study of modified Turing test in automated driving with affective variability modelling. Presented virtually at *International Graduate Forum on Language Cognitive Science*, Beijing, China, June 11. [[Slides](#)]
14. **Li, Z.**, Dong, Q., Hu, B.\* & Wu, H.\* (2022). Every individual makes a difference: A trinity derived from linking individual brain morphometry, connectivity and mentalising ability. Poster presented virtually at *the 14th Annual Meeting of the Social & Affective Neuroscience Society*, May 4-6. [[Poster](#)] [[Slides](#)] [[Video](#)]
15. **Li, Z.**, Jiang, Q., Wu, Z., Liu, A., Wu, H., Huang, M., Huang, K. & Ku, Y.\* (2021). Towards human-compatible autonomous car: A study of Turing test in automated driving with affective variability modelling. Presented at *the 1st International Symposium on Addiction and Decision Making*, Macao, China, November 19-20. **Best Presentation Award, the 3rd Place.** [[Slides](#)]
16. **Li, Z.**, Dong, Q., Hu, B.\* & Wu, H.\* (2021). Every individual makes a difference: A trinity derived from linking individual brain morphometry, functional connectivity and mentalising abilities. Presented at *the 1st International Symposium on Addiction and Decision Making*, Macao, China, November 19-20. **Award of Excellence.** [[Slides](#)]
17. **Li, Z.**, Jiang, Q., Wu, Z., Liu, A., Wu, H., Huang, M., Huang, K. & Ku, Y.\* (2021). Bot or not: How passenger tells apart AI and human drivers in the Turing test of automated driving? Presented virtually at *Greater Bay Area Young Scholar Forum on Psychological Science*, October 8-10. **Best Oral Presentation, the 3rd Place.** [[Abstract](#)] [[Slides](#)]

## INVITED TALKS

18. **Li, Z.**, Dong, Q., Hu, B.\* & Wu, H.\* (2023). Every individual makes a difference: A trinity derived from linking individual brain morphometry, connectivity and mentalising ability. *Invited talk at Reviews Reading Group (RRG)*, University of Macau, May 17. [[Slides](#)]
19. **Li, Z.** (2022). Towards building artificial social intelligence (ASI) with mentalising ability: Two preliminary studies. *Invited talk at NCC Lab & AND Lab Joint Workshop*, University of Macau, August 28. [[Slides](#)]

## RESEARCH EXPERIENCES

*Note. [x] refers to the journal articles, working papers and software packages mentioned above*

**Linking Individual Brain Morphometry, Connectivity and Mentalising Ability** <sup>[2]</sup> Macao, China  
*Individual Research, with Prof. Haiyan Wu, Affective, Neuroscience and Decision-making Lab at UM* 2021.06 - 2023.05

- ◆ Used IS-RSA to assess relationships between amygdala and hippocampal MMS, rs-FC and IMQ scores across the participants
- ◆ Proposed a novel pipeline to obtain a decent representation for high-dimensional MMS data in IS-RSA
- ◆ Found that a trinity existed in idiosyncratic patterns of brain morphometry, connectivity and mentalising ability
- ◆ Revealed that a region-related mentalising specificity emerged from the trinity
- ◆ Suggested that rs-FC gates the MMS predicted similarity in mentalising ability by using the dyadic regression analysis

**Non-verbal Turing Test in Automated Driving with Affective Transition Modelling** <sup>[1]</sup> Guangzhou, China  
*Research Assistant, with Prof. Yixuan Ku, Memory & Emotion Lab at SYSU* 2020.09 - 2023.06

- ◆ Designed a non-verbal variation of the Turing Test for automated driving based on 69 participants' feedback in the real world
- ◆ Found that the AI driver failed to pass the test because passengers detected the AI driver above chance
- ◆ Advanced a computational model combining SDT with PLMs to predict passengers' humanness rating behaviour in the test
- ◆ Revealed that the passengers' ascription of humanness would increase with the greater affective transition

**Multi-task Learning for Diagnosis Assistance based on Information Extraction and Text Classification** Guangzhou, China  
*NLP Engineer, Department of Big Data and Artificial Intelligence at Tianpeng Technology Co., Ltd.* 2019.09 - 2019.12

- ◆ Proposed a multi-task learning model to improve the interpretability of DL-based diagnosis prediction models
- ◆ Reached a hypothesis that diagnosis prediction and interpretability analysis may be mutually reinforcing

**Rare Disease Diagnosis based on Similarity Measuring and Additive Margin Softmax** Guangzhou, China  
*NLP Engineer, Department of Big Data and Artificial Intelligence at Tianpeng Technology Co., Ltd.* 2019.08 - 2019.12

- ◆ Applied the diagnosis prediction model for common diseases as an encoder to get the vector representation of each patient
- ◆ Employed cosine similarity-based KNN to contrast and sort the vector representations, achieving rare disease diagnosis
- ◆ Applied AM-Softmax as the loss function to reduce intra-class variation and increase the inter-class difference

**Fine-tuning ERNIE for Chest Abnormal Imaging Signs Extraction** <sup>[4]</sup> Guangzhou, China  
*NLP Engineer, Department of Big Data and Artificial Intelligence at Tianpeng Technology Co., Ltd.* 2019.04 - 2020.05

- ◆ Formulated chest abnormal imaging sign extraction as a sequence tagging and matching problem
- ◆ Alleviated the problem of data insufficiency by fine-tuning the pre-trained language model
- ◆ Designed a tag2relation algorithm to establish the relation between abnormal imaging signs and their attributes
- ◆ Proved the effectiveness of the proposed model for chest abnormal imaging signs extraction

**Causality Extraction based on Self-Attentive BiLSTM-CRF with Transferred Embeddings** <sup>[3]</sup> Guangzhou, China  
*Research Assistant, with Prof. Jiangtao Ren, Ren Lab at SYSU* 2018.09 - 2020.03

- ◆ Formulated causality extraction as a sequence tagging problem based on a novel causality tagging scheme
- ◆ Designed a tag2triplet algorithm to handle multiple causal triplets and embedded causal triplets in the same sentence
- ◆ Alleviated the problem of data insufficiency by incorporating transferred embeddings into the model
- ◆ Introduced the self-attention mechanism into the model to capture long-range dependencies between cause and effect
- ◆ Proved the effectiveness of the proposed model for causality extraction

**Causality Extraction based on Bi-directional LSTM Networks with Focal Loss** <sup>[5]</sup> Guangzhou, China

*Individual Research, with Prof. Jiangtao Ren, Ren Lab at SYSU* 2017.09 - 2018.04

- ♦ Investigated different BiLSTM-based end-to-end models to achieve the best performance of causal sequence labelling
- ♦ Applied focal loss as the loss function to address the tag class imbalance problem in the sequence labelling
- ♦ Proved that the proposed model can effectively enhance the association between cause and effect

## FELLOWSHIPS & AWARDS & HONORS

<b>The 4th MIND Computational Summer School Fellowship</b>	Hanover, United States
Methods in Neuroscience at Dartmouth (MIND) Summer School	2023
<b>Diversity Travel Award</b> <sup>[7]</sup>	Santa Barbara, United States
The 15th Annual Meeting of the Social & Affective Neuroscience Society	2023
<b>Excellent Presentation Award</b> <sup>[9]</sup>	Online
2022 National Doctoral Forum on Brain-Computer Intelligence and Psychology	2022
<b>Best Presentation Award, the 3rd Place</b> <sup>[15]</sup>	Macao, China
The 1st International Symposium on Addiction and Decision Making	2021
<b>Award of Excellence</b> <sup>[16]</sup>	Macao, China
The 1st International Symposium on Addiction and Decision Making	2021
<b>Best Oral Presentation, the 3rd Place</b> <sup>[17]</sup>	Online
Greater Bay Area Young Scholar Forum on Psychological Science	2021
<b>The 3rd Team</b>	Online
The 1st Computational Psychiatry Hack at China	2021
<b>The 10th Computational &amp; Cognitive Neuroscience (CCN) Summer School Fellowship</b>	Suzhou, China
Cold Spring Harbor Asia	2021.07 - 2021.08
<b>The Third Prize Scholarship for Postgraduate Students</b>	Guangzhou, China
Sun Yat-sen University	2016 - 2017

## PROFESSIONAL EXPERIENCES

<b>Teaching Assistant</b>	
♦ Cognitive Neuroscience (CC of MSc), Centre for Cognitive and Brain Sciences, University of Macau	2023.01 - 2023.05
<b>Research Assistant</b>	
♦ Memory & Emotion Lab, Department of Psychology, Sun Yat-sen University <sup>[1]</sup>	2020.07 - 2021.05
♦ Ren Lab, School of Computer Science and Engineering, Sun Yat-sen University <sup>[3]</sup>	2018.07 - 2019.03
<b>Natural Language Processing Engineer</b>	
♦ Department of Big Data and Artificial Intelligence at Tianpeng Technology Co., Ltd. <sup>[4]</sup>	2019.03 - 2019.12
<b>Memberships</b>	
♦ Cognitive Science Society (CSS)	2023
♦ Organisation for Human Brain Mapping (OHBM)	2023
♦ Society for Affective Science (SAS)	2023
♦ Social Affective Neuroscience Society (SANS)	2022 - 2023

## ORGANISED SEMINARS

<b>Social Cognition Seminar</b> <a href="#">[Resources]</a>	2022.02 - 2022.06
♦ Fiske, S. T., & Taylor, S. E. (2020). <i>Social cognition: From brains to culture</i> . SAGE Publications Ltd.	
♦ Fifteen participants, six presenters, fifteen seminars	
<b>Computational Modelling Seminar</b>	2021.10 - 2022.01
♦ Farrell, S. & Lewandowsky, S. (2018). <i>Computational modelling of cognition and behaviour</i> . Cambridge University Press.	
♦ Thirteen participants, eleven presenters, fourteen seminars	

## ADDITIONAL TRAINING

<b>The 4th Methods In Neuroscience At Dartmouth (MIND) Computational Summer School</b>	Hanover, United States
MIND Summer School	2023.08

**The 10th Computational & Cognitive Neuroscience (CCN) Summer School**

Cold Spring Harbor Asia

**Online Summer School for Computational Neuroscience**

Neuromatch Academy

**Natural Language Processing** [[Code](#)]

Udacity Nanodegree Program

**Deep Learning** [[Code](#)]

Udacity Nanodegree Program

**Machine Learning** [[Code](#)]

Coursera

Suzhou, China

2021.07 - 2021.08

Online interactive track

2021.07

Online

2018.08 - 2018.11

Online

2017.01 - 2017.05

Online

2016.09 - 2016.11

**LANGUAGE**

Mandarin Chinese, Jin Chinese (Bingzhou subgroup), English