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EDUCATION

University of Macau (UM) Macao, China
Doctor of Philosophy in Psychology 2021 - Present
Sun Yat-sen University (SYSU) Guangzhou, China
Master of Engineering in Software Engineering 2016 - 2018
Bachelor of Engineering in Information Security 2012 - 2016

RESEARCH INTERESTS

Topics

♦ Social cognition, social neuroscience, mentalising (读心术), artificial social intelligence, natural language processing

Methods

♦ Experimental design, computational modelling, fMRI, machine learning

AWARDS

Excellent Presentation Award Online
2022 National Doctoral Forum on Brain-Computer Intelligence and Psychology 2022
Best Presentation Award, the 3rd Place Macao, China
The 1st International Symposium on Addiction and Decision Making 2021
Award of Excellence Macao, China
The 1st International Symposium on Addiction and Decision Making 2021
Best Oral Presentation, the 3rd Place Online
Greater Bay Area Young Scholar Forum on Psychological Science 2021
The 3rd Team Online
The 1st Computational Psychiatry Hack at China 2021
The Third Prize Scholarship for postgraduate students Guangzhou, China
Sun Yat-sen University 2016 - 2017

PUBLICATIONS

Li, Z., Jiang, Q., Wu, Z., Liu, A., Wu, H., Huang, M., Huang, K. & Ku, Y. (revise and resubmit). Towards human-compatible autonomous car: A study of non-verbal Turing test in automated driving with affective transition modelling. *IEEE Transactions on Affective Computing*. [arXiv] [Data & Code]

Li, Z., Dong, Q., Hu, B. & Wu, H. (under review). Every individual makes a difference: A trinity derived from linking individual brain morphometry, connectivity and mentalising ability. *Human brain mapping*. [bioRxiv] [Data & Code]

Li, Z., Li, Q., Zou, X. & Ren, J. (2021). Causality extraction based on self-attentive BiLSTM-CRF with transferred embeddings. *Neurocomputing*, *423*, 207-219. [Paper] [arXiv] [Data & Code]

Li, Z. & Ren, J. (2020). Fine-tuning ERNIE for chest abnormal imaging signs extraction. *Journal of Biomedical Informatics*, *108*, 103492. [Paper] [arXiv] [Data & Code]

PATENTS

Li, Z. Causal Knowledge Extractor based on Deep Learning V1.0. China Patent Application 2018SR275268, Certificate No.: 2604363, filed 2018.

RESEARCH EXPERIENCE

Linking Individual Brain Morphometry, Connectivity and Mentalising Ability Macao, China
Individual Research, with Prof. Haiyan Wu, A. N. D Lab at UM 2021.06 - Present

- 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 Guangzhou, China
Research Assistant, with Prof. Yixuan Ku, Memory & Emotion Lab at SYSU 2020.09 - Present

- 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

Causality Extraction based on Self-Attentive BiLSTM-CRF with Transferred Embeddings Guangzhou, China
Research Assistant, with Prof. Jiangtao Ren 2018.09 - 2020.03

- Designed a causality tagging scheme 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 Guangzhou, China
Individual Research, with Prof. Jiangtao Ren 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

PROFESSIONAL EXPERIENCE

Fine-tuning ERNIE for Chest Abnormal Imaging Signs Extraction 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 based on the nature of chest imaging report text
- Proved the effectiveness of the proposed model for chest abnormal imaging signs extraction

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 inter-class difference

CONFERENCE PRESENTATIONS

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]

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]

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]

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]

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]

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]

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]

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]

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]

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**. [Slides]

INVITED TALKS & WORKSHOPS

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]

ORGANISED SEMINARS

Social Cognition Seminar [Resources] 2022.02 - 2022.06

- Fiske, S. T., & Taylor, S. E. (2020). *Social cognition: From brains to culture*. SAGE Publications Ltd.
- Fifteen participants, six presenters, fifteen seminars

Computational Modelling Seminar 2021.10 - 2022.01

- Farrell, S. & Lewandowsky, S. (2018). *Computational modelling of cognition and behaviour*. Cambridge University Press.
- Thirteen participants, eleven presenters, fourteen seminars

ADDITIONAL TRAINING

The Computational and Cognitive Neuroscience (CCN) summer school Suzhou, China
Cold Spring Harbor Asia 2021.07 - 2021.08

Online summer school for Computational Neuroscience Online
Neuromatch Academy 2021.07

LANGUAGE

Mandarin Chinese, Jin Chinese (Bingzhou subgroup), English