Shaonan Wang, Ph.D.
Associate Professor
Institute of Automation Chinese Academy of Sciences

EDUCATION AND TRAINING:

Northeastern University (China)	Automation	BS	2013
Institute of Automation Chinese Academy of Sciences	Pattern recognition and intelligence system	Ph.D.	2018

Supervisor: Dr Chengqing Zong

PROFESSIONAL APPOINTMENTS:

Associate Professor	Institute of Automation Chinese Academy of Sciences	2020.11-Now
Research Associate	New York University (Supervisor: Dr. Liina Pylkkänen)	2021.11-2023.11
Assistant Professor	Institute of Automation Chinese Academy of Sciences	2018.06-2020.11

HONORS AND AWARDS:

- 2022 NYU FAS Postdoctoral Travel Grant Award
- 2022 Member of Qingyuan Club in Beijing Academy of Artificial Intelligence (BBAI)
- 2021 China Association for Science and Technology Young Talent Support Project
- 2020 Young Talent Incentive of the Center for Excellence in Brain Science and Intelligent Technology of the Chinese Academy of Sciences
- 2020 Scholarship by the China Scholarship Council
- 2019 Chinese Academy of Sciences Excellent Doctoral Thesis Award
- 2019 Member of Youth Innovation Promotion Association, CAS
- 2018 Chinese Information Processing Society of China Excellent Doctoral Thesis Award
- 2018 CAS Presidential Scholarship (Special Prize)
- 2018 Beijing Outstanding Graduate Student Awards
- 2018 University of CAS Outstanding Graduate Student Awards

PUBLICATIONS:

JOURNALS

- Lin, Nan, Xiaohan Zhang, Xiuyi Wang, and **Shaonan Wang**. The organization of the semantic network as reflected by the neural correlates of six semantic dimensions. Brain and Language 250 (2024): 105388.
- **Shaonan Wang**, Yunhao Zhang, Shiwei Ting, Guangyao Zhang, Jiajun Zhang, Nan Lin, Chengqing Zong. A large dataset of semantic ratings and its computational extension. (2023). *Scientific Data, 10(1), 106.*
- **Shaonan Wang**, Xiaohan Zhang, Jiajun Zhang, Chengqng Zong. A synchronized multimodal neuroimaging dataset for studying brain language processing. (2022). *Scientific Data*, 9(1), 1-10.
- Li, Yupeng, Haorui He, **Shaonan Wang**, Francis CM Lau, and Yunya Song. Improved target-specific stance detection on social media platforms by delving into conversation threads. IEEE Transactions on Computational Social Systems (2023).
- **Shaonan Wang**, Yunhao Zhang, Xiaohan Zhang, Nan Lin, Jiajun Zhang, Chengqing Zong. An fMRI Dataset for Concept Representation with Semantic Feature Annotations. (2022). *Scientific Data.* 9(1), 721.
- **Shaonan Wang**, Jiajun Zhang, Haiyan Wang, Nan Lin and Chengqing Zong. Fine-grained Neural Decoding with Distributed Word Representations. *Information Sciences*, 507 (2020) 256–272.
- Jingyuan Sun, **Shaonan Wang**, Jiajun Zhang and Chengqing Zong. Neural Encoding and Decoding with Distributed Sentence Representations, *IEEE Transactions on Neural Networks and Learning Systems*, Vol.32, No.2, pp.589-603, 2020.
- Lin N, Xu Y, Yang H, **Wang, S**., et al. Dissociating the neural correlates of the sociality and plausibility effects in simple conceptual combination. *Brain Structure and Function*, 2020, 225(3): 995-1008.
- Kexin Wang, Yu Zhou, Jiajun Zhang, **Shaonan Wang**, and Chengqing Zong. Structurally-Comparative Hinge Loss for Dependency-based Neural Text Representation. *ACM Transactions on Asian and Low-Resource Language Information Processing,* Vol. 19, No. 4, Article 58, May 2020.
- Yang Liu, **Shaonan Wang**, Jiajun Zhang and Chengqing Zong. Experience-based Causality Learning for Intelligent Agents. ACM Transactions on Asian and Low-Resource Language Information Processing. Vol. 18, Article 45, 2019.
- **Shaonan Wang** and Chengqing Zong. Comparison Study on Critical Components in Composition Model for Phrase Representation, *ACM Transactions on Asian Language and Low-Resource Language Information Processing, Vol. 16, No. 3, Article 16, 25 pages, January 2017.*

- **Shaonan Wang**, Jiajun Zhang and Chengqing Zong. Empirical Exploring Word-Character Relationship for Chinese Sentence Representation, *ACM Transactions on Asian Language and Low-Resource Language Information Processing, Vol. 17, No. 3, Article 14, 18 pages, January 2018.*
- Lin N, Yang X, Li J, **Wang, S.,** et al. Neural correlates of three cognitive processes involved in theory of mind and discourse comprehension. *Cognitive, Affective, & Behavioral Neuroscience*, 2018, 18(2): 273-283.
- **Shaonan Wang**, Nai Ding, Nan Lin, Jiajun Zhang, Chengqing Zong. Language cognition and language computation – human and machine language understanding. *Scientia Sinica Informationis*, 2022. (In Chinese)
- **Shaonan Wang**, Jiajun Zhang, Chengqing Zong. A review of language cognition experiments based on language computational methods. *Journal of Chinese Information Processing*, 2022. (In Chinese)
- **Shaonan Wang**, Chengqing Zong. A Dual-LDA Method on Chinese Word Sense Representation and Induction. *Chinese Journal of Computers*, Vol.39, No.8, pp. 1652-1666, August 2016. (In Chinese)

CONFERENCES

- Amilleah Rodriguez, **Shaonan Wang**, Liina Pylkkanen. Do Language Models Compose Concepts the Way Humans Can? LREC-Coling 2024. Accepted.
- Sun, Jingyuan, Mingxiao Li, Zijiao Chen, Yunhao Zhang, **Shaonan Wang**, and Marie-Francine Moens. Contrast, attend and diffuse to decode high-resolution images from brain activities. Advances in Neural Information Processing Systems 36 (2024).
- Zhang, Yunhao, Chong Li, Xiaohan Zhang, Xinyi Dong, and **Shaonan Wang**. A Comprehensive Neural and Behavioral Task Taxonomy Method for Transfer Learning in NLP. In Findings of the Association for Computational Linguistics: IJCNLP-AACL 2023 (Findings), pp. 233-241. 2023.
- Li, Chong, **Shaonan Wang**, Yunhao Zhang, Jiajun Zhang, and Chengqing Zong. Interpreting and Exploiting Functional Specialization in Multi-Head Attention under Multi-task Learning. In Proceedings of the 2023 Conference on Empirical Methods in Natural Language Processing, pp. 16460-16476. 2023.
- Lee, Soo-Hwan, and **Shaonan Wang**. Do language models know how to be polite?. Proceedings of the Society for Computation in Linguistics 6, no. 1 (2023): 375-378.
- Xiaohan Zhang, **Shaonan Wang**, Nan Lin, Jiajun Zhang, Chengqing Zong. Is the Brain Mechanism for Hierarchical Structure Building Universal Across Languages? An fMRI Study of Chinese and English. *In Proceedings of 2022 Conference on Empirical Methods in Natural Language Processing.*
- Xiaohan Zhang, **Shaonan Wang**, and Chengqing Zong. How Does the Experimental Setting Affect the Conclusions of Neural Encoding Models? Proceedings of the 13th Conference on Language Resources and Evaluation (LREC 2022), pages 6397–6404, Marseille, 20-25 June 2022.
- Shuxian Zou, **Shaonan Wang**, Jiiajun Zhang, Chengqing Zong. Cross-Modal Cloze Task: A New Task to Brain-to-Word Decoding. ACL-2022 Findings.
- Xiaohan Zhang, **Shaonan Wang**, Nan Lin, Jiajun Zhang and Chengqing Zong. Probing Word Syntactic Representations in the Brain by a Feature Elimination Method. AAAI-2022
- **Shaonan Wang**, Bingyu Liu. Multiple Sequential Learning Tasks Represented in Recurrent Neural Networks. NeurIPS 2021 AI for Science Workshop. Online. Dec 13, 2021.
- Shuxian Zou, **Shaonan Wang**, Jiiajun Zhang, Chengqing Zong. Towards Brain-to-Text Generation: Neural Decoding with Pre-trained Encoder-Decoder Models. NeurIPS 2021 AI for Science Workshop. Online. Dec 13, 2021.
- **Shaonan Wang**, Jiajun Zhang, Nan Lin and Chengqing Zong. Probing Brain Activation Patterns by Dissociating Semantics and Syntax in Sentences. The *Thirty-Fourth AAAI Conference on Artificial Intelligence*, New York, USA, Feb. 7-12, 2020.
- Jingyuan Sun, **Shaonan Wang**, Jiajun Zhang, and Chengqing Zong. Distill and Replay for Continual Language Learning. *The 28th International Conference on Computational Linguistics*, Online, December 8-13, 2020, pp. 3569-3579
- Jingyuan Sun, **Shaonan Wang,** Jiajun Zhang and Chengqing Zong. Towards Sentence-Level Brain Decoding with Distributed Representations. In *Proceedings of the 33rd AAAI Conference on Artificial Intelligence,* 2019, pp. 7047-7054.
- Kexin Wang, Yu Zhou, **Shaonan Wang**, Jiajun Zhang and Chengqing Zong. Understanding Memory Modules on Learning Simple Algorithms*. In Proceedings of the IJCAI-19 Workshop on Explainable Artificial Intelligenc, Macao, China, August 10-16, 2019, pp.5471-5477*
- Junnan Zhu, Qian Wang, Yining Wang, Yu Zhou, Jiajun Zhang, **Shaonan Wang**, and Chengqing Zong. NCLS: Neural Cross-Lingual Summarization. *In Proceedings of 2019 Conference on Empirical Methods in Natural Language Processing and 9th International Joint Conference on Natural Language Processing, November 3–7, Hong Kong, China, 2019, pp.3045-3055*
- **Shaonan Wang**, Jiajun Zhang and Chengqing Zong. Associative Multichannel Autoencoder for Multimodal Word Representation. In *Proceedings of the 2018 Conference on Empirical Methods in Natural Language Processing*, 2018, pp. 116-124.
- Jingyuan Sun, **Shaonan Wang** and Chengqing Zong. Memory, Show the Way: Memory Based Few Shot Word Representation Learning. In *Proceedings of the 2018 Conference on Empirical Methods in Natural Language Processing*, 2018, pp. 1435-1444.

- **Shaonan Wang**, Jiajun Zhang, Nan Lin and Chengqing Zong. Investigating Inner Properties of Multimodal Representation and Semantic Compositionality with Brain-based Componential Semantics. In *Proceedings of the 32nd AAAI Conference on Artificial Intelligence*, 2018, pp. 5964-5972.
- **Shaonan Wang**, Jiajun Zhang and Chengqing Zong. Learning Multimodal Word Representation via Dynamic Fusion Methods. In *Proceedings of the 32nd AAAI Conference on Artificial Intelligence*, 2018, pp. 5973-5980.
- **Shaonan Wang**, Jiajun Zhang and Chengqing Zong. Learning Sentence Representation with Guidance of Human Attention. In *Proceedings of the 26th International Joint Conference on Artificial Intelligence*, 2017, pp. 4137-4143.
- **Shaonan Wang**, Jiajun Zhang and Chengqing Zong. Exploiting Word Internal Structures for Generic Chinese Sentence Representation. In *Proceedings of the 2017 Conference on Empirical Methods in Natural Language Processing*, 2017, pp. 298-303.

POSTERS
- **Shaonan Wang**, Jiajun Zhang and Chengqing Zong. Decoding the time course of acoustic, lexical, syntactic and semantic features with MEG during story listening. The 14th Annual Meeting of the Society for the Neurobiology of Language (SNL). 2022

PAPERS in REVIEW
- **Shaonan Wang,** Songhee Kim, Jeffrey R. Binder, Liina Pylkkänen. Unlocking the complexity of phrasal composition: an interplay between semantic features and linguistic relations
- **Shaonan Wang**, Jingyuan Sun, Yunhao Zhang, Nan Lin, Chengqing Zong. Computational Models to Study Language Processing in the Human Brain: A Survey
- Xinpei Zhao**, Shaonan Wang**, Chengqing Zong. MapGuide: A Simple yet Effective Method to Reconstruct Continuous Language from Brain Activities
- Chong Li, **Shaonan Wang**, Jiajun Zhang, Chengqing Zong. Improving In-context Learning of Multilingual Generative Language Models with Cross-lingual Alignment
- Chong Li, **Shaonan Wang**, Jiajun Zhang, Chengqing Zong. X-Instruction: Aligning Language Model in Low-resource Languages with Self-curated Cross-lingual Instructions
- Yunhao Zhang, **Shaonan Wang**, Chengqing Zong. Navigating Brain Language Representations: A Comparative Analysis of Neural Language Models and Psychologically Plausible Models
- Soo-Hwan Lee, Gurmeet Kaur, **Shaonan Wang.** Language model performance on politeness dependencies in Hindi and Korean.
- Xiaohan Zhang, Yunhao Zhang, Chong Li, **Shaonan Wang.** MulCogBench: A Multi-modal Cognitive Benchmark Dataset for Evaluating Chinese and English Computational Language Models
- Li, J., **Wang, S**., Luh, W. M., Pylkkänen, L., Yang, Y., & Hale, J. (2021). Cortical processing of reference in language revealed by computational models.

RESEARCH GRANTS
- Natural Science Foundation of China, No. 61906189, $45,000, PI
- Natural Science Foundation of China, No. 62036001, $123,000, Co-I
- National Key Research and Development Program of China. $137,000, 2021ZD0204105. Co-I

PROFESSIONAL ACTIVITIES / SCIENTIFIC LEADERSHIP:
- **Neuromatch Academy Curriculum - Exec Chair**
- **Co-Chair of Virtual Infrastructure Committee**, The Joint Conference of the 59th Annual Meeting of the Association for Computational Linguistics and the 11th International Joint Conference on Natural Language Processing (ACL-IJCNLP 2021)
- **Associate Editor,** Transactions on Asian and Low-Resource Language Processing
- **Review Editor**, Neurobiology of Language (specialty section of Frontiers in Language Sciences)
- **Reviewer**, including Scientific Data, Cognition, the IEEE Transactions on Neural Networks and Learning Systems, IEEE/CAA Journal of Automatica Sinica, CAAI Transactions on Intelligence Technology, Transactions on Pattern Analysis and Machine Intelligence, Transactions on Asian and Low-Resource Language Information Processing, Human Brain Mapping, the Journal of Chinese information processing, the Annual Conference of the North American Chapter of the Association for Computational Linguistics, and the International Joint Conference on Artificial Intelligence, among several others.

TEACHING
- Computational linguistics for brain encoding and decoding. UCAS-AI, Summer 2024. Instructor.
  https://wangshaonan.github.io/Computational-Linguistics-for-Brain-Encoding-and-Decoding/docs/schedule.html

- Deep learning. 2023. Neuromatch Academy. Teaching assistant.
- Natural language processing. UCAS, 2020,2021. Teaching assistant.

INVITED TALKS AND LECTURES

- EMNLP 2024 Tutorial. Computational Linguistics for Brain Encoding and Decoding: Principles, Practices and Beyond
- Neural encoding and decoding with textual representations. Neuroimaging Methods Workshop. December 10, 2022.
- Combining cutting-edge artificial intelligence and neuroscience research, language learning, and ancient poetry appreciation. ISLSEAI-2022. October 29, 2022.
- Human and Machine language understanding. YSSNLP-2022. May 28, 2022.
- Human and Machine language understanding. CCL-2021. October 22, 2021.
- Neural encoding and decoding in the brain. YSSNLP-2019. May 3, 2019.
- Associative Multichannel Autoencoder for Multimodal Word Representation. EMNLP-18. October 31, 2018.
- Investigating Inner Properties of Multimodal Representation and Semantic Compositionality with Brain-based Componential Semantics. AAAI-18. February 2, 2018.
- Learning Multimodal Word Representation via Dynamic Fusion Methods. AAAI-18. February 2, 2018.
- Exploiting Word Internal Structures for Generic Chinese Sentence Representation. EMNLP-17. September 9, 2017.
- Learning Sentence Representation with Guidance of Human Attention. IJCAI-17. August 19, 2017.