YANG XU

Curriculum Vitae
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5500 Campanile Dr, San Diego, CA 92182
Phone: (814) 441-9473
Email: yang.xu@sdsu.edu; Website: `clcs.sdsu.edu`

Department of Computer Science
College of Sciences
San Diego State University

RESEARCH INTERESTS

My research interest lies in the intersection of natural language processing, machine learning, psycholinguistics, and cognitive sciences. My daily research activities include (but are not limited to): developing multi-modal machine learning models for huamn language, developing computational methods for the short-term adaptation in dialogue, designing human-centered interaction systems, and studying long-term change in language. The questions that interest me include: how people adjust their language to reach better coordination in dialogue and to maintain efficient communication, how do certain linguistic constructions correspond to the cognitive constraints of human mind, how the vector space representations of word semantics evolve historically etc. I am also strongly interested in using theories, findings, and inspirations from the cognitive sciences perspectives to improve the design of artificial intelligence (AI) systems.

PROFESSIONAL EXPERIENCE

Assistant Professor of Computer Science — Aug 2018 – Present
Department of Computer Science, San Diego State University

EDUCATION

Ph.D in Information Sciences and Technology — Aug 2013 – May 2018
The Pennsylvania State University, USA

Master of Science — Sep 2010 – July 2013
Department of Psychology, Tsinghua University, China

Bachelor of Engineering — Sep 2006 – July 2010
Department of Electronic Engineering, Tsinghua University, China

RESEARCH GRANTS

PI, NSF-CRII-HCC (**awarded**), $166K, 2021 – 2023
Modeling computer-mediated task-oriented dialogues with multi-modality information theoretic approaches

Co-PI, NIH (subaward to SDSU HealthLink) (**awarded**), $50K, 2021 – 2022
An NLP Approach to Analyze the Past and Present, and Inform the Future of Health Disparities Research

PI, NSF-RETTL, $800K (unfunded), 2021
Enabling Interactive Online Education based on Multimodal Analysis and Multi-Modality Machine Learning Techniques

Co-PI, NSF-SCH, $1.4M (unfunded), 2021
Examine Your Eye: Smart Translation of Erythrocyte moving pattern for iLLness prediction (EYES TELL)

PI, NSF-CRII, $200K (unfunded), 2019
Towards Explainable Word Embeddings: A Historical Language Change Perspective

Co-PI, DoE, $1.5M (unfunded), 2019
Machine Learning Enhanced Automatic and Rapid Design of Electric Power Converters

PI, NSF-IIS, $500K (unfunded), 2018
Computational Studies of Long-term Language Change by Fine-tuning Word Embedding Models

PUBLICATIONS

In submission

Nika Nizharadze and **Yang Xu**. Wikisource as a corpus for studying historical language changes. 2020. (In submission)

Kaiwen Feng and **Yang Xu**. Easy-embs: A framework for convenient and efficient implementation of subword-incorporated word embedding models. 2020. (In submission)

Yang Xu, Jeremy Cole, and David Reitter. Linguistic alignment affected more by low-level linguistic features rather than social power. 2020. (In submission to journal)

Published

Yang Xu. Global divergence and local convergence of utterance semantic representations in dialogue. In *Proceedings of the Society for Computation in Linguistics*. 2021. (Accepted)

Yang Xu and Zheng-sheng Zhang. Historical changes in semantic weights of subword units. In Adam Jatowt, Nina Tahmasebi, Yang Xu, and Lars Borin, editors, *Computational Approaches to Semantic Change*. 2021. (In press)

M Alex Kelly, **Yang Xu**, Jesús Calvillo, and David Reitter. Which sentence embeddings and which layers encode syntactic structure? In *Proceedings of the 42nd Annual Meeting of the Cognitive Science Society*, pages 2375–2381, 2020

Yang Xu, Jiasheng Zhang, and David Reitter. Treat the word as a whole or look inside? subword embeddings model language change and typology. In *Proceedings of the 1st International Workshop on Computational Approaches to Historical Language Change*, pages 136–145, Florence, Italy, 2019. Association for Computational Linguistics

Yang Xu, Jeremy Cole, and David Reitter. Linguistic alignment is affected more by lexical surprisal rather than social power. *Proceedings of the Society for Computation in Linguistics*, 2(1):349–352, 2019

Yang Xu, Jeremy Cole, and David Reitter. Not that much power: Linguistic alignment is influenced more by low-level linguistic features rather than social power. In *Proceedings of the 56th Annual Meeting of the Association for Computational Linguistics (Volume 1: Long Papers)*, volume 1, pages 601–610, 2018

Yang Xu and David Reitter. Information density converges in dialogue: Towards an information-theoretic model. *Cognition*, 170:147–163, 2018

Yang Xu and David Reitter. Spectral analysis of information density in dialogue predicts collaborative task performance. In *Proceedings of the 55th Annual Meeting of the Association for Computational Linguistics (Volume 1: Long Papers)*, pages 623–633, Vancouver, Canada, 2017

Yang Xu and David Reitter. Entropy converges between dialogue participants: Explanations from an information-theoretic perspective. In *Proceedings of the 54th Annual Meeting of the Association for*

Computational Linguistics (Volume 1: Long Papers), pages 537–546, Berlin, Germany, August 2016. Association for Computational Linguistics

Yang Xu and David Reitter. Convergence of syntactic complexity in conversation. In *Proceedings of the 54th Annual Meeting of the Association for Computational Linguistics (Volume 2: Short Papers)*, pages 443–448, Berlin, Germany, August 2016. Association for Computational Linguistics

Yang Xu and David Reitter. An evaluation and comparison of linguistic alignment measures. In *Proceedings of Cognitive Modeling and Computational Linguistics (CMCL)*, pages 58–67, Denver, CO, 2015. Association for Computational Linguistics

Alexander G. Ororbia II, **Yang Xu**, Vito D'Orazio, and David Reitter. Error-correction and aggregation in crowd-sourcing of geopolitical incident information. In N. Agarwal et al., editor, *Social Computing, Behavioral Modeling and Prediction*, volume 9021 of *Lecture Notes in Computer Science*, pages 381–387. Springer, 2015

David Reitter, **Yang Xu**, Patrick Craven, Anikó Sándor, R. Chris Garrett, E. Vince Cross, and Jerry L. Franke. Cognitive models predicting surprise in robot operators. In *Proc. International Conference on Cognitive Modeling*, pages 190–191, Groningen, Netherlands, 2015

Yang Xu and Hong Li. Influence of visibility range and degree of urgency on efficiency of evacuation: Mediating effect of herding behavior. *Studies of Psychology and Behavior*, 13(3):311–319, 2015. (Published in Chinese)

Hong Li, **Yang Xu**, Shi Chen, and Anqi Gao. Effects of intuition and analysis on the adoption of sources of information in escape decision-making. *Studies of Psychology and Behavior*, 10(6):452–458, 2012. (Published in Chinese)

INVITED TALKS

Westlake University, China — Nov 2019
Host: NLP Group of Dr. Yue Zhang — *Title*: Dialogue from an Information-Theoretic Perspective

Shanghai Jiao-Tong University, China — Nov 2019
Host: College of Engineering — *Title*: Efficient Communication in Dialogue

Tsinghua University, China — Nov 2019
Host: Dept. of Psychology — *Title*: An Information Theoretic Psycholinguistic Model of Dialogue

San Diego State University — Oct 2019
Host: Dept. of Math and Stats — *Title*: Statistical Methods Used in Natural Language Processing

San Diego State University — Oct 2019
Host: SDSU A.I. Seminar — *Title*: Recent Advances in Natural Language Processing

San Diego State University — Feb 2018
Host: Dept. of CS — *Title*: Computational Understanding of Dialogue and Language

HONOR AND AWARDS

Award for Research Excellence — Penn State, College of Information Sciences and Technology, 2018
Outstanding Graduates Award — Tsinghua University, 2013
Distinguished Master Thesis Award — Tsinghua University, 2013
Fellowship of Excellence in College Entrance Exam — Changxing, Zhejiang, 2006

PROFESSIONAL SERVICES

Reviewer for ACL 2020	2020
Reviewer for CONLL 2019	2019
Reviewer for ACL 2019	2019
Reviewer for CogSci 2019	2019
Reviewer for CogSci 2018	2018

COURSES TAUGHT

CS560 Algorithms and Their Analysis	Spring 2020/2019
CS596 Machine Learning	Fall 2019/2018