

Tyler A. Chang

he/him/his

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EDUCATION

University of California San Diego PhD Student in Cognitive Science Halıcıoğlu Data Science Institute, Graduate Fellow	2020-Present
Carleton College , Northfield, MN BA in Mathematics, summa cum laude BA in Cognitive Science, with distinction	2016-2020
Budapest Semesters in Mathematics Eötvös Loránd University, Budapest, Hungary	Fall 2018
Carleton Linguistics and Culture Doshisha University, Kyoto, Japan	Spring 2018

RESEARCH INTERESTS

- **Natural language processing:** large language models, deep learning interpretability and analysis.
- **Cognitive linguistics:** distributional semantics, language acquisition.

INDUSTRY

Google Research , Responsible AI, PhD Student Researcher ▪ Pre-training, tuning, and analysis of large language models.	2022-Present
Amazon Science , Applied Scientist Intern ▪ AWS AI Labs: linguistic dataset drift and out-of-domain language model generalization. ▪ Alexa AI: content change prediction on the web for intelligent web crawling.	Summers 2021, 2022
Google , Software Engineering Intern ▪ Cloud AI Translation: automatic sentence pair extraction from human-translated documents. ▪ Geo Machine Perception: aerial and street level imagery alignment at scale. ▪ Chrome Web Store (Engineering Practicum Intern): servers for tens of millions of monthly users.	Summers 2018, 2019, 2020

ACADEMIA

Graduate Student Researcher , UC San Diego Language and Cognition Lab; Machine Learning, Perception, and Cognition Lab ▪ Natural language processing and computational linguistics research.	2020-Present
Research Assistant , Carleton College Language and Cognition Lab, Cognitive Science Research Lab ▪ Eye-tracking studies examining how people identify objects in conversation. ▪ Interviews assessing knowledge representation in children.	2019-2020

TEACHING

Teaching Assistant , UC San Diego COGS188 AI Algorithms, COGS108 Data Science in Practice.	2021
Course Staff , Carleton College CS254 Computability and Complexity, CS111 Introduction to Computer Science.	2019

AWARDS AND FELLOWSHIPS

Graduate Prize Fellowship, Halicioğlu Data Science Institute	2020-2024
Glushko Travel and Research Award, UCSD Cognitive Science	2020-2024
Roy O. Elveton Prize in Cognitive Science and Philosophy, Carleton College	2020
Google Spot Bonus, Google Geo Machine Perception	2019
Patricia V. Damon Scholarship, Carleton College	2019-2020
Phi Beta Kappa Third-Year Inductee, Carleton College	2019
Phi Beta Kappa First Year Prize, Carleton College	2018
Dean's List, Carleton College	2017, 2018, 2019
Stuebe Endowed Scholarship, Carleton College	2017-2020
National Merit Scholar, National Merit Scholarship Corporation	2016-2020

PUBLICATIONS

Peer-reviewed.

Note: top-tier venues in natural language processing are often conference proceedings rather than journals.

- Chang, T. A.**, & Bergen, B. K. (2024). Language model behavior: A comprehensive survey. *Computational Linguistics*.
- Michaelov, J.*, Arnett, C.*, **Chang, T. A.**, & Bergen, B. K. (2023). Structural priming demonstrates abstract grammatical representations in multilingual language models. *Proceedings of the Conference on Empirical Methods in Natural Language Processing (EMNLP)*. *Equal contribution.
- Chang, T. A.**, Halder, K., Anna John, N., Vyas, Y., Benajiba, Y., Ballesteros, M., & Roth, D. (2023). Characterizing and measuring linguistic dataset drift. *Proceedings of the 61st Annual Meeting of the Association for Computational Linguistics (ACL)*.
- Trott, S.*, Jones, C. R.*, **Chang, T. A.**, Michaelov, J., & Bergen, B. K. (2023). Do large language models know what humans know? *Cognitive Science*. *Equal contribution.
- Chang, T. A.**, Tu, Z., & Bergen, B. K. (2022). The geometry of multilingual language model representations. *Proceedings of the Conference on Empirical Methods in Natural Language Processing (EMNLP)*.
- Chang, T. A.**, & Bergen, B. K. (2022). Word acquisition in neural language models. *Transactions of the Association for Computational Linguistics (TACL)*. Presented at ACL 2022.
- Chang, T. A.**, & Bergen, B. K. (2022). Does contextual diversity hinder early word acquisition? *Proceedings of the 44th Annual Conference of the Cognitive Science Society (CogSci)*.
- Jones, C. R., **Chang, T. A.**, Coulson, S., Michaelov, J., Trott, S., & Bergen, B. K. (2022). Distributional semantics still can't account for affordances. *Proceedings of the 44th Annual Conference of the Cognitive Science Society (CogSci)*.
- Chang, T. A.**, Xu, Y., Xu, W., & Tu, Z. (2021). Convolutions and self-attention: Re-interpreting relative positions in pre-trained language models. *Proceedings of the 59th Annual Meeting of the Association for Computational Linguistics and the 11th International Joint Conference on Natural Language Processing (ACL-IJCNLP)*.
- Xu, Y., Xu, W., **Chang, T. A.**, & Tu, Z. (2021). Co-scale conv-attentional image transformers. *Proceedings of the IEEE/CVF International Conference on Computer Vision (ICCV)*.

WORKSHOPS AND ABSTRACTS

Peer-reviewed.

- Arnett, C., **Chang, T. A.**, Michaelov, J., & Bergen, B. K. (2023). Crosslingual structural priming and the pre-training dynamics of bilingual language models. *3rd Multilingual Representation Learning Workshop* (workshop at EMNLP). Extended abstract.

Chang, T. A., & Rafferty, A. N. (2020). Encodings of source syntax: Similarities in NMT representations across target languages. *Proceedings of the 5th Workshop on Representation Learning for NLP* (workshop at ACL).

OTHER WORK / PREPRINTS

Chang, T. A., Tu, Z., & Bergen, B. K. (under review). Learning, forgetting, and stability: Characterizing learning curves during language model pre-training.

Chang, T. A., Arnett, C., Tu, Z., & Bergen, B. K. (under review). When is multilinguality a curse? Language modeling for 250 high- and low-resource languages.

Chang, T. A. (2020). Emergence of hierarchical syntax in neural machine translation. *Carleton Digital Commons*. Undergraduate thesis, Carleton College Cognitive Science. With distinction.

Chang, T. A. (2020). Topology of second order tensor fields. *Carleton Digital Commons*. Undergraduate thesis, Carleton College Mathematics and Statistics.

SERVICE

ACL Rolling Review (ARR) reviewer (Association for Computational Linguistics)	2023
ACL reviewer (Annual Meeting of the Association for Computational Linguistics)	2023
FAccT reviewer (Conference on Fairness, Accountability, and Transparency)	2023
EMNLP reviewer (Conference on Empirical Methods in NLP)	2022, 2023
CogSci reviewer (Conference of the Cognitive Science Society)	2022, 2023
PNAS reviewer (Proceedings of the National Academy of Sciences)	2022
UCSD Graduate Application Mentorship Program, mentor	2022-2023
ICLR volunteer (International Conference on Learning Representations)	2022
ACL conference volunteer (Association for Computational Linguistics)	2020, 2021, 2022
EMNLP conference volunteer (Empirical Methods in NLP)	2020, 2022
Carleton Alumni Relations Office, student supervisor	2017-2020
Carleton Alumni Relations Office, student caller	2016-2017