

Ta-Chung Chi

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Education

Carnegie Mellon University

PH.D. IN LANGUAGE TECHNOLOGIES

- Advisor: Alexander I. Rudnicky
- Thesis Title: Toward Length Extrapolatable Transformers

Pittsburgh, USA

2024 (Expected)

Carnegie Mellon University

M.S. IN LANGUAGE TECHNOLOGIES

- Advisor: Advisor: Alexander I. Rudnicky

Pittsburgh, USA

2021

National Taiwan University

M.S. IN COMPUTER SCIENCE AND INFORMATION ENGINEERING

- Advisor: Yun-Nung (Vivian) Chen

Taipei, Taiwan

2019

National Taiwan University

B.S. IN COMPUTER SCIENCE AND INFORMATION ENGINEERING

- Ranked 5 out of 114; Overall GPA 4.16/4.3; Presidential Award

Taipei, Taiwan

2017

Research Experience

Boeing Research and Technology

RESEARCH INTERN / MANAGER: CHAD MCFARLAND AND LI YANG

- **Boeing ATC project:** Designed and implemented a dialogue system to understand the air traffic control language.

AL, USA

summer 2023

Alexa AI, Amazon Lab 126

RESEARCH INTERN / MANAGER: MAHDI NAMAZIFAR

- **Book Dialogue Agent:** Designed a dialogue agent that can talk about books with users. The Transformer language model I developed can process long input sequences.

CA, USA

summer 2022

Alexa AI, Amazon Lab 126

RESEARCH INTERN / MANAGER: DILEK HAKKANI-TUR

- **Vision and Dialogue Navigation:** Designed a new framework to endow a multimodal dialogue agent with question-asking behavior to resolve ambiguities during indoor navigation.

CA, USA

summer 2019

Publications

ARXIV PREPRINT

- [1] Attention Alignment and Flexible Positional Embeddings Improve Transformer Length Extrapolation
Ta-Chung Chi, Ting-Han Fan, Alexander I Rudnicky
arXiv preprint arXiv:2311.00684, 2023 .

SELECTED CONFERENCE PROCEEDINGS

- [1] Latent Positional Information is in the Self-Attention Variance of Transformer Language Models Without Positional Embeddings (**Outstanding Paper Honorable Mention**)
Ta-Chung Chi, Ting-Han Fan, Li-Wei Chen, Alexander I Rudnicky, Peter J Ramadge
Annual Meeting of the Association for Computational Linguistics (ACL), 2023, Toronto, Canada .
- [2] Dissecting Transformer Length Extrapolation via the Lens of Receptive Field Analysis (**Outstanding Paper Award**)
Ta-Chung Chi, Ting-Han Fan, Alexander I Rudnicky, Peter J Ramadge
Annual Meeting of the Association for Computational Linguistics (ACL), 2023, Toronto, Canada .
- [3] Transformer Working Memory Enables Regular Language Reasoning and Natural Language Length Extrapolation
Ta-Chung Chi, Ting-Han Fan, Alexander I Rudnicky, Peter J Ramadge
Findings of the Association for Computational Linguistics: EMNLP, 2023, Singapore .
- [4] KERPLE: Kernelized Relative Positional Embedding for Length Extrapolation
Ta-Chung Chi, Ting-Han Fan, Peter J Ramadge, Alexander Rudnicky
Advances in Neural Information Processing Systems (NeurIPS), 2022, New Orleans, USA .
- [5] Structured Dialogue Discourse Parsing
Ta-Chung Chi, Alexander Rudnicky
Proceedings of the 23rd Annual Meeting of the Special Interest Group on Discourse and Dialogue (SIGDIAL), 2022, Edinburgh, UK .
- [6] Training Discrete Deep Generative Models via Gapped Straight-Through Estimator
Ting-Han* Fan, Ta-Chung* Chi, Alexander I. Rudnicky, Peter J Ramadge
Proceedings of the 39th International Conference on Machine Learning (ICML), 2022, Baltimore, USA .
- [7] Zero-Shot Dialogue Disentanglement by Self-Supervised Entangled Response Selection
Ta-Chung Chi, Alexander Rudnicky

Empirical Methods in Natural Language Processing (EMNLP), 2021, Punta Cana, Dominican Republic .

- [8] Tartan: A Two-Tiered Dialog Framework For Multi-Domain Social Chitchat
Fanglin Chen, Ta-Chung Chi, Shiyang Lyu, Jianchen Gong, Tanmay Parekh, Rishabh Joshi, Anant Kaushik, Alexander Rudnicky
The 3rd Alexa Prize Proceeding, 2020 .
- [9] Just Ask: An Interactive Learning Framework for Vision and Language Navigation
Ta-Chung Chi, Mihail Eric, Seokhwan Kim, Minmin Shen, Dilek Hakkani-Tur
Association for the Advancement of Artificial Intelligence (AAAI), 2020, New York, USA .
- [10] Cluse: Cross-lingual undersupervised sense embeddings
Ta-Chung Chi, Yun-Nung Chen
Empirical Methods in Natural Language Processing (EMNLP), 2018, Brussels, Belgium .
- [11] Speaker Role Contextual Modeling for Language Understanding and Dialogue Policy Learning
Ta-Chung Chi, Po-Chun Chen, Shang-Yu Su, Yun-Nung Chen (co-first)
International Joint Conference on Natural Language Processing (IJCNLP), 2017, Taipei, Taiwan .
- [12] Dynamic Time-Aware Attention to Speaker Roles and Contexts for Spoken Language Understanding
Ta-Chung Chi, Po-Chun Chen, Shang-Yu Su, Yun-Nung Chen (co-first)
IEEE Automatic Speech Recognition and Understanding Workshop (ASRU), 2017, Okinawa, Japan .

Program Committees

- 2023 **Reviewer**, Interspeech 2023
- 2022 **Reviewer**, AAAI 2023
- 2022 **Reviewer**, IEEE TSALP
- 2022 **Reviewer**, ICASSP 2022
- 2021 **Reviewer**, ARR Nov 2021
- 2021 **Reviewer**, 3rd Workshop on NLP for ConvAI
- 2020 **Reviewer**, DSTC 9
- 2020 **Reviewer**, AAAI 2021
- 2020 **Reviewer**, Human in the Loop Dialogue Systems Workshop - NeurIPS 2020
- 2019 **Reviewer**, 1st Workshop on NLP for ConvAI - ACL

Honors & Awards

- 2023 **Outstanding Paper Award**, ACL
- 2019 **ACLCLP Thesis Award**, ACLCLP
- 2017 **Presidential Award**, NTU CSIE

Press

- 2019 **Amazon proposes a home robot that asks you questions when it's confused**, VentureBeat
- 2019 **Alexa Prize SocialBot Grand Challenge - Team Tartan**, Amazon Science