Yu-Neng (Allen) CHUANG

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EDUCATION

Rice University Houston, TX
Ph.D. in Computer Science (Advisor: Dr. Xia "Ben" Hu) *Aug. 2021 - Present*

National ChengChi University (NCCU) Taipei, Taiwan
Master of Science in Computer Science *Feb. 2018 - Jun. 2020*

National ChengChi University (NCCU) Taipei, Taiwan
Bachelor of Science in Mathematical Sciences *Aug. 2013 - Jul. 2017*

RESEARCH INTERESTS AND SKILLS

- Machine learning: Efficiency and Trustworthy issues (Explainability, Uncertainty, and Safety) on Large Language Models (LLMs), Explainable Artificial Intelligence, AI in Healthcare
- Data Mining: Recommender Systems, Graph Neural Network, Network Embedding

RESEARCH EXPERIENCE

Rice University Houston, TX
Graduate Research Assistant *Aug. 2021 - Present*

- Built efficient framework for LLMs on prompt compression for lower inference latency and budgets
- Developed prompting and finetuning algorithms on uncertainty, explainability, and safety issues of LLMs
- Developed efficient explainable frameworks for generating ML models and LLMs

Samsung Research America Mountain View, CA
Research Intern *May 2023 - Aug. 2023*

- Developed an efficient algorithm of hard prompt compression on large language models, deducing the 80% of LLM API usage cost and up to 4 times lower latency of white box LLMs.

Living Analytics Research Centre., Carnegie Mellon University and SMU Singapore
Research Assistant *Jan. 2020 - Apr. 2020*

- Built a ranking method for a personalized job recommendation system with 1 million target users in Singapore, which outperformed other state-of-the-art ranking methods by 10.2%
- Developed an open-source package for textual-based recommendation systems to better exploit TB-scaled textual information with TB-scaled users' interaction information

Institute of Information Science., Academia Sinica Taipei, Taiwan
Research Assistant *Dec. 2020 - Jun. 2021*

- Developed privacy-aware recommendation systems to protect users' private information from being attacked through the API callback
- Developed a two-tower sequential-based model on time series data for high-contributed customer prediction and loan prediction, which achieves 530% of improvement in online testing

KKBOX Co, Ltd. Taipei, Taiwan
Data Scientist Intern *Sep. 2019 - Jun. 2020*

- Developed a recommendation algorithm that utilized the TB-scale user feedback dataset, enhancing the 15.3% of the performance compared with the prior internal ticket and video recommendation systems
- Investigated the data distribution of the graph embedding space to improve the recommendation performance on the TB-scaled music streaming dataset, yielding up to 17.7% improvement in offline testing

PUBLICATIONS

Conference and Journal Papers

[C1] **Y.N. Chuang**, R. Tang, X. Jiang, and X. Hu. "SPeC: A Soft Prompt-Based Calibration on Performance Variability of Large Language Model in Clinical Notes Summarization" *Journal of Biomedical Informatics (JBI, 2024)*

[C2] R. Tang, **Y.N. Chuang**, and X. Hu. "The Science of LLM-generated Text Detection" *The Communications of the ACM (CACM, 2024)*

[C3] **Y.N. Chuang**, G. Wang et al., and X. Hu "DiscoverPath: A Knowledge Refinement and Retrieval System for Interdisciplinarity on Biomedical Research" *ACM International Conference on Information and Knowledge Management (CIKM'23 Best Demo Paper Honorable Mention)*

[C4] **Y.N. Chuang***, G. Wang*, F. Yang, Q. Zhou, P. Tripathi, X. Cai and X. Hu. "CoRTX: Contrastive Learning for Real-time Explanations" *International Conference on Learning Representations (ICLR'23)*

[C5] **Y.N. Chuang***, G. Wang*, M. Du, F. Yang, Q. Zhou, P. Tripathi, X. Cai and X. Hu. "Accelerating Shapley Explanation via Contributive Cooperator Selection" *International Conference on Machine Learning (ICML'22 Spotlight)*

[C6] **Y.N. Chuang***, C.M. Chen*, C.J. Wang, M.F. Tsai, Y. Fang, and E.P. Lim. "TPR: Text-aware Preference Ranking for Recommender Systems" *ACM International Conference on Information and Knowledge Management (CIKM'20 Oral)*

[C7] **Y.N. Chuang***, C.J. Wang*, C.M. Chen, and M.F. Tsai. "Skewness Ranking Optimization for Personalized Recommendation" *Conference on Uncertainty in Artificial Intelligence (UAI'20 Oral)*

[C8] S.C. Lin, **Y.N. Chuang**, S.F. Yang, M.F. Tsai, and C.J. Wang*. "Negative-aware Collaborative filtering" *ACM Conference on Recommender Systems (RecSys'19)*

[C9] **Y.N. Chuang**, Z.Y. Huang, and Y.L. Tsai. "Variational Grid Setting Network" *International Conference on Asian Language Processing (IALP'17)*

Preprints and Under Review

[P1] **Y.N. Chuang**, G. Wang, C.Y. Chang, Mengnan Du, R. Tang, X. Cai, F. Yang, and X. Hu. "Large Language Models As Faithful Explainer" (*Arxiv 2024*)

[P2] **Y.N. Chuang**, T. Xing, C.Y. Chang, Z. Liu, X. Chen, and X. Hu. "Learning to Compress Prompt in Natural Language Formats" (*Arxiv 2023*)

[P3] **Y.N. Chuang***, R. Tang*, and X. Hu. "Secure Your Model: A Simple but Effective Key Prompt Protection Mechanism for Large Language Models" (*Arxiv 2023*)

[P4] **Y.N. Chuang**, G. Wang, F. Yang, Z. Liu, X. Cai, M. Du, and X. Hu. "Efficient XAI Techniques: A Taxonomic Survey" (*Arxiv 2023*)

[P5] **Y.N. Chuang**, K.H. Lai, R. Tang, M. Du, C.Y. Chang, N. Zou, and X. Hu. "Mitigating Relational Bias on Knowledge Graphs" (*Arxiv 2022*)

[P6] **Y.N. Chuang**, Cheng-Te Li. "Privacy-Preserving Representation Learning with Gradient Obfuscation against Attribute Inference for Recommendation" (*Arxiv 2021*)

[P7] G. Wang, **Y.N. Chuang**, F. Yang, et al., and X. Hu. "LETA: Learning Transferable Attribution for Generic Vision Explainer" (*Arxiv 2023*)

[P8] C.Y. Chang, **Y.N. Chuang**, Z. Jiang, K.H. Lai, A. Jiang, N. Zou. "CODA: Temporal Domain Generalization via Concept Drift Simulator" (*Arxiv 2023*)

[P9] C.Y. Chang, **Y.N. Chuang**, G. Wang, M. Du, and N. Zou. "DISPEL: Domain Generalization via Domain-Specific Liberating" (*Arxiv 2023*)

[P10] C.Y. Chang, **Y.N. Chuang**, K.H. Lai, X. Han, X. Hu, N. Zou. "Towards Assumption-free Bias Mitigation" (*Arxiv 2023*)

OPEN SOURCE PACKAGE

DiscoverPath: A Knowledge Refinement and Retrieval System for Interdisciplinarity on Biomedical Research

- Designed a KG-based retrieval system designed for biomedical research aims to assist biomedical researchers in dynamically refining their queries and effectively retrieving articles.
- *Project Leader.* Designed the architecture of the system, encompassing comprehensive full-stack web development, database configuration, and algorithmic design.

SMORe: Modularize Graph Embedding for Recommendation

- Developed real-time online streaming algorithm for online music streaming services in Spotify Inc. and KKBOX Inc.
- *Developer.* Constructed a large-scale network embedding library for recommendation systems on online streaming services, which was developed under C++ with multi-thread processing techniques

TextRec: General Recommendation System with Textual Information

- A package of general ranking algorithms on learning textual information with user-item interaction utilized in the Healthcare AI systems of ASUS Inc.
- *Project Leader.* Designed the architecture of the package and implemented API based on the package for better accessing recommendation results

HONORS AND AWARDS

- Best Student Paper Award Finalist, Texas Medical Center AI Summit *Feb. 2024*
- Best Demo Paper Award Honorable Mention, CIKM *Oct. 2023*
- 4th Place, ACM RecSys Challenge *Sep. 2020*
- Dean's List Award, NCCU *Aug. 2020*
- 1st Place, TREC CAsT Competition *Aug. 2019*

PROFESSIONAL SERVICES

Reviewer (Since 2020): KDD, NeurIPS, ICLR, ICML, IJCAI, CIKM, IEEE TAI, IEEE TIST, IEEE ICHI