

YUN CHENG (JOE) WANG

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EDUCATION

University of Southern California

Los Angeles, CA

Doctor of Philosophy, Electrical and Computer Engineering

Jan 2021 - Present

- Advisor: Professor C.-C. Jay Kuo, **Anticipated graduation date: May 2024**

University of Southern California

Los Angeles, CA

Master of Science, Electrical and Computer Engineering, GPA: 4.0/4.0

Aug 2018 - Dec 2019

- Relevant coursework: Analysis of Algorithms, Convex Optimization, Multimedia Compression

National Taiwan University

Taipei, Taiwan

Bachelor of Science, Electrical Engineering, GPA: 3.8/4.3

Sep 2014 - Jun 2018

- Relevant coursework: Digital Speech Processing, Machine Learning Foundations, Artificial Intelligence

RESEARCH INTERESTS

Knowledge Graphs, Data Mining, Representation Learning, Machine Learning on Graphs, Lightweight and Efficient Machine Learning Models, Natural Language Processing, Perceptual Quality Assessment.

TECHNICAL SKILLS

- **Programming Languages:** Python, C++, Java, Matlab, SPARQL, Bash, L^AT_EX
- **Software & APIs:** Apache Spark, Neo4j, Git, PyTorch, scikit-learn, XGBoost, nltk, OpenCV

RESEARCH AND INDUSTRY EXPERIENCE

USC Media Communication Lab (MCL), Los Angeles, CA

Knowledge graph completion

Jan 2021 - Present

- Infer missing information in knowledge graphs based on observed triples.
- Work on various knowledge graph completion tasks including link prediction, triple classification, entity type prediction, and entity alignment.
- Develop models achieving SOTA results in low dimensions, i.e. 32 dimensions, on most knowledge graph datasets, where results are comparable with models in high dimensions, i.e. 500 dimensions.

Blind image and video quality assessment

Aug 2021 - Present

- Predict mean opinion scores (MOS) for in-the-wild images and user-created videos without pristine images and videos.
- Design a lightweight pipeline deploying on user-end achieving SOTA results on synthetic datasets and results competitive to deep learning models on authentic datasets with 54 times smaller model size.
- Manage real-time inference on CPUs to process one image in 38ms on average.
- Hold monthly sync meetings with Meta Platforms, Inc.

Academia Sinica, Taipei, Taiwan

Compositional word embeddings for Chinese

Sep 2020 - Dec 2020

- Improved word embeddings for Chinese by incorporating semantic constituents of words.
- Leveraged structured word definitions in E-HowNet, a lexical knowledge base with 95K annotated Chinese words, to compose word embeddings using multi-relational graph convolutional networks.
- Incorporated masked language models for downstream Chinese applications.

Taboola Inc., Los Angeles, CA

Data Science Intern

Jun 2019 - Aug 2019

- Constructed a large-scale knowledge graph to discover trending topics in daily news articles.
- Processed more than 20K news articles from multiple publishers and update knowledge base within an hour everyday.
- Mentored 2 Computer Science undergraduate interns.

TEACHING AND MENTORING EXPERIENCE

- Guest lecture for EE669: Multimedia Data Compression, USC, Fall 2022.
- Graduate student mentor, USC Viterbi School of Engineering, Fall 2021.
- Course mentor for EE503: Probability for Electrical and Computer Engineer, USC, Fall 2019.

ACADEMIC PROJECTS

Knowledge Graph for Music Recommendation Fall 2021

Final Project for DSCI558: Building Knowledge Graphs

- Crawled and queried data from 3 music websites and wikidata to construct a knowledge graph with 23K soundtracks, 7.5K albums, 11.5K artists, and 471K relations.
- Devised a recommendation system by training embeddings for soundtracks, artists, genres, and lyrics.

Object and Key Phrases Retrieval for YouTube Videos Mar 2019

2019 LA Hacks

- Enhanced YouTube search engine by allowing searches for specific objects or key phrases in videos.
- Used Google Cloud Platform as backend and JavaScript to implement frontend.

Drama Storyteller Dec 2017 - Jul 2018

Collaboration between NTU MPAC Lab and KKTV Co., Ltd.

- Identified storyline in each episode of dramas with machine learning models and extract a video thumbnail.
- Conducted subjective and A/B tests with more than 20 subjects to evaluate generated video thumbnails.

PUBLICATIONS

- [1] **Yun-Cheng Wang**, Xiou Ge, Bin Wang, C.-C. Jay Kuo, “GreenKGC: A Lightweight Knowledge Graph Completion Method”, *arXiv preprint*, 2022.
- [2] Xiou Ge, **Yun-Cheng Wang**, Bin Wang, C.-C. Jay Kuo, “CompoundE: Knowledge Graph Embedding with Translation, Rotation and Scaling Compound Operations”, *arXiv preprint*, 2022.
- [3] Zhanxuan Mei, **Yun-Cheng Wang**, Xingze He, C-C Jay Kuo, “GreenBIQA: A Lightweight Blind Image Quality Assessment Method”, *IEEE MMSP*, 2022.
- [4] Xiou Ge, **Yun-Cheng Wang**, Bin Wang, C.-C. Jay Kuo, “CORE: A knowledge graph entity type prediction method via complex space regression and embedding”, *Pattern Recognition Letter*, 2022.
- [5] **Yun-Cheng Wang**, Xiou Ge, Bin Wang, C.-C. Jay Kuo, “KGBoost: A Classification-Based Knowledge Base Completion Method with Negative Sampling”, *Pattern Recognition Letter*, 2022.
- [6] Bin Wang, Fenxiao Chen, **Yun-Cheng Wang**, C.-C. Jay Kuo, “Efficient Sentence Embedding via Semantic Subspace Analysis”, *International Conference on Pattern Recognition (ICPR)*, 2020.
- [7] Fenxiao Chen, **Yun-Cheng Wang**, Bin Wang, C.-C. Jay Kuo, “Graph representation learning: A survey”, *APSIPA Transactions on Signal and Information Processing*, 2020.
- [8] Bin Wang, Angela Wang, Fenxiao Chen, **Yun-Cheng Wang**, C.-C. Jay Kuo, “Evaluating word embedding models: Methods and experimental results”, *APSIPA Transactions on Signal and Information Processing*, 2019.

PRESENTATIONS

- Research “Rule-Guided Knowledge Graph Completion: A Binary Classification Approach” is presented at 11-th USC ECE research festival, Oct 2021.
- Invited talk “Introduction to Knowledge Graphs: Constructions, Embeddings, and Applications” for Electrical Engineering graduate students at National Taiwan Normal University, Taipei, Taiwan, Sep 2020.

HONORS, MEMBERSHIP, AND PROFESSIONAL SERVICE

- 2022 APSIPA Sadaoki Furui Prize Paper Award.
- Journal reviewer: IEEE/ACM TASLP (2022); Conference reviewer: ECML-PKDD (2022).
- Viterbi Graduate Fellowship, Spring 2021.
- Student member, IEEE and IEEE signal processing society, 2018 to present.
- USC EE MS honors program, Dec 2019.