Joo-Kyung Kim

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Professional Experience

Amazon AGI — Seattle, WA
Senior Applied Scientist — *Aug 2017 – Present*
- Designing and building machine learning models and systems for improving Alexa's core AI components such as multi-modal response generation, multi-modal content recommendation, ambiguity clarification, name-free interaction, dynamic routing.
- Ambiguity clarification for large-scale spoken language understanding [ASRU21]
- Hypothesis reranking with multi-label, positive, unknown, and negative data [ICASSP20]
- Personalized domain classification with supervised attention [EMNLP2018]
- Out-of-domain detection for large-scale domain classification [Interspeech18]
- Hypothesis reranking for large-scale natural language understanding [NAACL18]

Microsoft — Bellevue, WA
Research Intern — *May 2016 – Aug 2016*
- Deep learning on Conversational Understanding
- Mentor: Gokhan Tur, Asli Celikyilmaz

NEC Laboratories — Princeton, NJ
Research Associate — *May 2015 – Aug 2015*
- Constituency parsing with deep & recursive neural networks
- Mentor: Bing Bai

Nuance — Sunnyvale, CA
Research Intern — *Jun 2014 – Aug 2014*
- Named entity recognition with neural networks for spoken dialog systems
- Mentor: Adwait Ratnaparkhi

Naver — Seongnam, Korea
Manager — *Sep 2008 – Jul 2010*
- Web search modeling for Naver Japan
- Developed integrated search services for Naver (C++, PHP, MySQL)

Zio Interactive — Seoul, Korea
Software Engineer (Alternative military service) — *Oct 2002 – Mar 2004*
- Developed game servers and P2P network frameworks for three online mobile games (C++)
- Developed three mobile game clients (Brew, JAVA ME)

IBK System — Seoul, Korea
Software Enginer (Alternative military service) — *Feb 2001 – Oct 2002*
- Developed a middleware, a TP-monitor, and a file transfer system for financial data transfer through dedicated access lines (C++, Delphi)
- Developed three financial risk management systems and a knowledge management system (C, Delphi, JAVA)

Education

The Ohio State University — Columbus, OH
Ph.D., Department of Computer Science and Engineering — *Aug. 2017*
- Dissertation: Linguistic Knowledge Transfer for Enriching Vector Representations
- Advisor: Eric Fosler-Lussier

Seoul National University — Seoul, Korea
M.S., School of Computer Science and Engineering — *Aug. 2008*
- Thesis: Evolutionary optimization of a collection of variable-length subpatterns for pattern classification
- Advisor: Byoung-Tak Zhang

Sogang University — Seoul, Korea
B.E., Department of Computer Science — *Aug. 2005*
- Thesis: Real-time news categorization system
- Advisor: Jihoon Yang

Selected Publications

Jihyung Kil, Farideh Tavazoee, Dongyeop Kang, and **Joo-Kyung Kim**. "II-MMR: Identifying and Improving Multi-modal Multi-hop Reasoning in Visual Question Answering". In: *ACL Findings*. 2024.

Shirley Anugrah Hayati, Taehee Jung, Tristan Bodding-Long, Sudipta Kar, Abhinav Sethy, **Joo-Kyung Kim**, and Dongyeop Kang. "Chain-of-Instructions: Compositional Instruction Tuning on Large Language Models". In: *arXiv:2402.11532*. 2024.

Jinyoung Park, Ameen Patel, Omar Zia Khan, Hyunwoo J. Kim, and **Joo-Kyung Kim**. "Graph-Guided Reasoning for Multi-Hop Question Answering in Large Language Models". In: *arXiv:2311.09762*. 2023.

Taehee Jung, **Joo-Kyung Kim**, Sungjin Lee, and Dongyeop Kang. "Cluster-Guided Label Generation in Extreme Multi-Label Classification". In: *EACL*. 2023.

Joo-Kyung Kim, Guoyin Wang, Sungjin Lee, and Young-Bum Kim. "Deciding Whether to Ask Clarifying Questions in Large-Scale Spoken Language Understanding". In: *ASRU*. 2021.

Joo-Kyung Kim and Young-Bum Kim. "Pseudo Labeling and Negative Feedback Learning for Large-scale Multi-label Domain Classification". In: *ICASSP*. 2020.

Joo-Kyung Kim and Young-Bum Kim. "Supervised Domain Enablement Attention for Personalized Domain Classification". In: *EMNLP*. 2018.

Joo-Kyung Kim and Young-Bum Kim. "Joint Learning of Domain Classification and Out-of-Domain Detection with Dynamic Class Weighting for Satisficing False Acceptance Rates". In: *Interspeech*. 2018.

Young-Bum Kim, Dongchan Kim, **Joo-Kyung Kim**, and Ruhi Sarikaya. "A Scalable Neural Shortlisting-Reranking Approach for Large-Scale Domain Classification in Natural Language Understanding". In: *NAACL*. 2018.

Joo-Kyung Kim, Young-Bum Kim, Ruhi Sarikaya, and Eric Fosler-Lussier. "Cross-Lingual Transfer Learning for POS Tagging without Cross-Lingual Resources". In: *EMNLP*. 2017.

Joo-Kyung Kim, Gokhan Tur, Asli Celikyilmaz, Bin Cao, and Ye-Yi Wang. "Intent Detection using Semantically Enriched Word Embeddings". In: *SLT*. 2016.

Joo-Kyung Kim, Marie-Catherine de Marneffe, and Eric Fosler-Lussier. "Adjusting Word Embeddings with Semantic Intensity Orders". In: *ACL Workshop on Representation Learning for NLP (RepL4NLP)*. 2016.

Joo-Kyung Kim, Marie-Catherine de Marneffe, and Eric Fosler-Lussier. "Neural word embeddings with multiplicative feature interactions for tensor-based compositions". In: *NAACL Workshop on Vector Space Modeling for NP (VSM)*. 2015.

Joo-Kyung Kim and Marie-Catherine de Marneffe. "Deriving adjectival scales from continuous space word representations". In: *EMNLP*. 2013.

Joo-Kyung Kim and Byoung-Tak Zhang. "Evolving hypernetworks for pattern classification". In: *IEEE Congress on Evolutionary Computation (CEC)*. 2007.

Joo-Kyung Kim, Byung Soo Kim, Oh Kyuk Kwon, Seung Kon Hwang, Jung-Woo Ha, Chan-Hoon Park, Duck Jin Chung, Chong Ho Lee, Jaehyun Park, and Byoung-Tak Zhang. "A DNA computing-inspired silicon chip for pattern recognition". In: *International Meeting on DNA Computing (DNA)*. 2007.

Byoung-Tak Zhang and **Joo-Kyung Kim**. "DNA hypernetworks for information storage and retrieval". In: *International Meeting on DNA Computing (DNA)*. 2006.

Academic Research Experience

Virtual Patient Project Aug 2016 – Dec 2016

- Robust clarification of diagnostic questions in dialogues with virtual patients

The Babel Program (IARPA) Jan 2012 – May 2014

- Built deep neural networks with multiple acoustic features, multiple target label sets from various languages, and the combination of different architectures to obtain higher ATWVs for novel languages with significantly less training data that are also noisy and heterogeneous.

Academic Services

Area Chair

- NAACL 2024, ACL 2024

Reviewer

- ACL 2019-2023, EMNLP 2019-2023, NAACL 2019-2022, EACL 2021-2023, AACL 2023, AAAI 2020-2022, IEEE TASLP 2020-2021

Skills

Programming Languages

- Python, JAVA, C/C++, Lua, Objective C, Delphi, PHP

Machine Learning Frameworks

- PyTorch, Torch, DyNet, Matlab