

Byungkook Oh

MACHINE LEARNING/DEEP LEARNING RESEARCH ENGINEER · COMPUTER SCIENCE

Internet Computing Lab, 50 Yonsei-ro, Seodaemun-gu, Seoul, 03722, Republic of KOREA

☎ (+82) 10-3742-3516 | ✉ bkoh509@gmail.com | 🌐 icl.yonsei.ac.kr | 📄 byungkook-oh-1b0b981a3 | 🎓 B. Oh

Research Interest

- Natural Language Processing
- Knowledge Graph Embedding
- Knowledge Representation
- Knowledge-Aware Recommender Systems
- Information Extraction from Text

Education

Yonsei University

Seoul, Republic of Korea

PH.D. CANDIDATE IN COMPUTER SCIENCE, GPA: 4.15/4.3

Feb. 2015 - PRESENT

- Thesis Topic: Context-Aware Relational Learning for Knowledge Graph Completion
- Thesis Advisor: Kyong-Ho Lee

Yonsei University

Seoul, Republic of Korea

B.S. IN COMPUTER SCIENCE, MAJOR GPA: 3.72/4.3

Feb. 2011 - Feb. 2015

Publications

International Conference

- Seungmin Seo, **Byungkook Oh**, Jeongbeom Jeong, Donghyun Kim, Kyong-Ho Lee, DongHoon Shin, and Yeonsoo Lee, "Deep Active Learning for Cross-sentence N-ary Relation Extraction," In EMNLP 2020 (under review)
- Dongho Lee, **Byungkook Oh**, Seungmin Seo, and Kyong-Ho Lee, "News Recommendation with Topic-Enriched Knowledge Graphs," In CIKM 2020 (accept).
- Sanghak Lee, Seungmin Seo, **Byungkook Oh**, Kyong-Ho Lee, DongHoon Shin, and Yeonsoo Lee, "Cross-sentence N-ary Relation Extraction using Entity Link and Discourse Relation," In CIKM 2020 (accept).
- Sungkwang Eom, **Byungkook Oh**, Seungmin Seo, and Kyong-Ho Lee, "Multi-task Learning for Spatiotemporal Events Prediction from Social Data," In KDD 2020 (under review).
- Xiongnan Jin, **Byungkook Oh**, Sanghak Lee, Dongho Lee, Kyong-Ho Lee, and Liang Chen, "Learning Region Similarity over Spatial Knowledge Graphs with Hierarchical Types and Semantic Relations," In CIKM 2019, pp. 669-678.
- **Byungkook Oh**, Seungmin Seo, Cheolheon Shin, Eunju Jo, and Kyong-Ho Lee, "Topic-Guided Coherence Modeling for Sentence Ordering by Preserving Global and Local Information," In EMNLP 2019, pp. 2273-2283 (oral presentation).
- **Byungkook Oh**, Seungmin Seo, and Kyong-Ho Lee, "Knowledge Graph Completion by Context-Aware Convolutional Learning with Multi-hop Neighborhoods," In CIKM 2018, pp. 257-266.
- Seungmin Seo, Sejin Chun, **Byungkook Oh**, and Kyong-Ho Lee, "SDPA: Sensor Data Processing Architecture for Modelling Semantic Data from Sensor Streams," In IRI 2015, pp. 9-16.
- Sejin Chun, Seungmin Seo, **Byungkook Oh**, and Kyong-Ho Lee, "Semantic Description, Discovery and Integration for the Internet of Things," In ICSC 2015, pp. 272-275.

International Journal - SCI(E)

- **Byungkook Oh**, Seungmin Seo, and Kyong-Ho Lee, "Meta Relational Learning for Low-Resource Knowledge Graphs," Transaction of Knowledge and Data Engineering (Under Review).
- **Byungkook Oh**, Seungmin Seo, Jimin Hwang, Dongho Lee, and Kyong-Ho Lee, "Zero-Shot Knowledge Graph Completion for Unseen Entities and Relations via Attentive Feature Aggregation," Information Systems, 2020 (Under Review).
- Seungmin Seo, **Byungkook Oh**, Eunju Jo, Sanghak Lee, Dongho Lee, Kyong-Ho Lee, Donghoon Shin, and Yeonsoo Lee, "Deep Active Learning for Knowledge Graph Schema Expansion," IEEE Transactions on Knowledge and Data Engineering, 2020 (Under Review).
- Eunju Jo, Seungmin Seo, **Byungkook Oh**, and Kyong-Ho Lee, "Context-Aware Cross-Sentence Relation Extraction," Knowledge and Information Systems, 2020 (Under Review).
- Seungmin Seo, **Byungkook Oh**, and Kyong-Ho Lee, "Reliable Knowledge Graph Path Representation Learning," IEEE Access, Vol. 8, pp. 32816-32825, 2020.
- **Byungkook Oh**, Jimin Hwang, Seungmin Seo, Sejin Chun, and Kyong-Ho Lee, "Inductive Gaussian Representation of User-Specific Information for Personalized Stress-Level Prediction," Expert Systems With Applications, 2019 (Under Review).
- **Byungkook Oh**, Sangjin Shin, Sungkwang Eom, Jooik Jung, Minjae Song, Seungmin Seo, and Kyong-Ho Lee, "Reliable TF-based recommender system for capturing complex correlations among contexts," Journal of Intelligent Information Systems, Vol. 52, No. 2, pp.337-365, 2019.
- Minjung Kim, **Byungkook Oh**, Jooik Jung, and Kyong-Ho Lee, "Outlier-robust Web Service Selection Based on a Probabilistic QoS Model," International Journal of Web and Grid Services, Vol. 12, No. 2, pp. 162-181, 2016.

Domestic Conference

- Minjung Kim, Xiongnan Jin, Jooik Jung, **Byungkook Oh**, and Kyong-Ho Lee, "Web Service Selection based on a Probabilistic QoS Model," In KCC 2015, pp. 479-480.

Patents

- Kyung-Ho Lee, Sanghak Lee, **Byungkook Oh**, Seungmin Seo, Donghoon Shin, and Yeonsoo Lee, "Method and Apparatus for Relation Extraction between Entities," KR Patent Application No. 10-2020-0073918, filed June 17, 2020. Patent Pending.
- **Byungkook Oh** and Kyong-Ho Lee, "Method and Apparatus for Completing Zero-Shot Knowledge Graph Using Multi-Hop Neighborhoods," KR Patent Application No. 10-2019-0129123, filed October 17, 2019. Patent Pending.
- **Byungkook Oh** and Kyong-Ho Lee, "Method and Apparatus for Reconstructing Sentence Order through Topic-Guided Coherence Modeling," KR Patent Application No. 10-2019-0136138, filed October 30, 2019. Patent Pending.
- **Byungkook Oh** and Kyong-Ho Lee, "Method and Apparatus for Completing Knowledge Graph Based on Convolutional Learning Using Multi-Hop Neighborhoods," KR Patent Application No. 10-2019-0040173, filed April 5, 2019. Patent Pending.
- **Byungkook Oh** and Kyong-Ho Lee, "Recommender System and Method Considering Correlations among Contexts," KR Patent No. 10-1997222, filed January 03, 2018. and issued July 01, 2019.

Project Experiences

동적으로 진화하는 지식그래프의 정보 품질 개선을 위한 심층 표현학습

한국연구재단

DEEP REPRESENTATION LEARNING FOR IMPROVING THE INFORMATION QUALITY OF DYNAMICALLY EVOLVING KNOWLEDGE GRAPHS

Jun. 2019 - PRESENT

- 연구개발실무총괄 (기획, 제안, 개발, 검증 등)
- 제로샷/퓨샷 지식 추론 학습 모델 개발 (GCN 등 활용)
- 심층 표현 학습 기반 지식 추론 모델 개발

액티브 러닝을 활용한 다항 관계 지식 추출 및 구조화 기술 연구

NC소프트 R&D

ACTIVE LEARNING BASED N-ARY RELATION EXTRACTION AND STRUCURALIZATION

May. 2019 - PRESENT

- 한국어 데이터셋 구축
- 관계 추출 모델 개발 (tree-LSTM, Transformer 등 활용)
- 액티브 러닝 알고리즘 개발

XAI (eXplainable AI) 기반 스마트 에너지 플랫폼 기술 개발

한전 전력연구원

DEVELOPMENT OF XAI-BASED TECHNOLOGY FOR SMART ENERGY PLATFORM

Mar. 2018 - PRESENT

- 연구개발실무총괄 (기획, 제안, 개발, 검증 등)
- 가상 마이크로그리드 데이터셋 구축
- 에너지 지식 그래프 설계 및 지식 추론 연구
- 수요예측 딥러닝&확률모형 융합 모델 개발

사물인터넷을 위한 복합 이벤트 처리 기반 개인맞춤 상황인지형 추천 시스템

A PERSONALIZED CONTEXT-AWARE RECOMMENDATION SYSTEM

- 연구개발실무총괄 (기획, 제안, 개발, 검증 등)
- 지식 추론 모델 개발 (CNN, TF, GCN 등 활용)
- 텐서 분해 기반 추천 시스템 개발

한국연구재단

Jun. 2016 - Jun. 2019

사용자 중심 지식그래프 스키마 확장 기술

USER-CENTERIC KNOWLEDGE GRAPH SCHEMA EXPANSION TECHNOLOGY

- 한국어 데이터셋 구축
- 관계 추출 모델 개발 (Transformer 등 활용)
- 액티브 러닝 알고리즘 개발

NC소프트 R&D

Jun. 2018 - Feb. 2019

통합 주소/식별체계에 기반한 IoT 서비스 플랫폼

SERVICE PLATFORM FOR INTERNET OF THINGS

- 기계 학습 기반 스트림 데이터 처리
- 구조적 데이터 생성 모델 개발

미래창조과학부

Apr. 2013 - Apr. 2018

IoV 데이터 저장 및 분석을 위한 자동차 클라우드 서비스 플랫폼

CLOUD-BASED SERVICE PLATFORM FOR IOV DATA STORAGE AND ANALYSIS

- IoV 플랫폼 기술 검증
- 데이터셋 수집 및 구축

미래창조과학부

Jun. 2016 - Dec. 2016

사물 웹에서 빅 데이터의 시맨틱 매쉬업을 위한 클라우드 컴퓨팅 프레임워크

A CLOUD COMPUTING FRAMEWORK FOR SEMANTIC MASHUP OF BIG DATA IN THE WEB OF THINGS

- 웹 기반 데이터 매쉬업 프레임워크 개발
- 데이터 매쉬업 시나리오에 기반한 실제 모형 개발

한국연구재단

Jun. 2013 - Jun. 2016

제로에너지 커뮤니티에 적용한 가능한 시맨틱 서비스 및 기술 연구

SEMANTIC SERVICES AND TECHNOLOGIES FOR REALIZING ZERO-ENERGY COMMUNITY

- 프로슈머 기반 에너지 지식 그래프 설계

한국전자통신연구원 (ETRI)

Aug. 2015 - Dec. 2015

개인지식그래프에 기반한 시맨틱 검색 및 추천

SEMANTIC SEARCH AND SERVICE RECOMMENDATION BASED ON PERSONAL KNOWLEDGE GRAPH

- 지식그래프 탐색 알고리즘 개발
- 텐서 분해 기반의 개인맞춤 상황인지형 추천 시스템 개발

LG전자

Mar. 2015 - Oct. 2015

Honors & Awards

- BK21 PLUS Yonsei Scholarship in 2016-2, 2018-1, 2018-2, 2019-1, 2019-2, and 2020-1
- Yonsei University Research Scholarship in 2019-1 and 2020-1
- Undergraduate, Software Capstone Design (2014 fall semester), 1st prize
- Undergraduate, 2013 Spring semester GPA honors
- Undergraduate, National S&T (Science & Technology) Scholarship (Full Tuition for 2011)