

# Jeonghwan Kim

Research Associate at KAIST IR&NLP Lab

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## RESEARCH INTERESTS

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### Natural Language Processing

Question Answering, Model Robustness, Neuro-symbolic Reasoning, Semi-Parametric Language Models, Efficiency, Model Interpretability

## EDUCATION

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### Korea Advanced Institute of Science and Technology (KAIST)

Daejeon, Korea

M.S. in School of Computing

Feb. 2020 - Feb. 2022

- Research Associate at IR&NLP Lab (Advisor: Sung-Hyon Myaeng)
- Thesis committee: Sung-Hyong Myaeng, Alice Oh, Junho Lim
- GPA: 4.13 / 4.30

### Handong Global University

Pohang, Korea

B.S. in Computer Science & Electrical Engineering

Mar. 2014 - Feb. 2020

- Magna Cum Laude
- GPA: 4.11 / 4.50
- Research Intern at MLLab (Advisor: Heeyoul Henry Choi)

## PUBLICATIONS

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- [1] **Graph-Induced Transformers for Efficient Multi-Hop Question Answering** EMNLP, 2022  
Giwon Hong, **Jeonghwan Kim**, Junmo Kang, Sung-Hyon Myaeng [pdf]
- [2] **Exploiting Numerical-Contextual Knowledge to Improve Numerical Reasoning in Question Answering** Findings of NAACL, 2022  
**Jeonghwan Kim**, Junmo Kang, Kyung-min Kim, Giwon Hong, Sung-Hyon Myaeng [pdf]
- [3] **Have You Seen That Number? Investigating Extrapolation in Question Answering Models** EMNLP, 2021  
**Jeonghwan Kim**, Giwon Hong, Kyung-min Kim, Junmo Kang, Sung-Hyon Myaeng [pdf]
- [4] **Leveraging Order-Free Tag Relations for Context-Aware Recommendation** EMNLP, 2021  
Junmo Kang, **Jeonghwan Kim**, Suwon Shin, Sung-Hyon Myaeng [pdf]
- [5] **Can You Distinguish Truthful from Fake Reviews? User Analysis and Assistance Tool for Fake Review Detection** HCI+NLP@EACL, 2021  
**Jeonghwan Kim\***, Junmo Kang\*, Suwon Shin\*, Sung-Hyon Myaeng [pdf]
- [6] **Maximizing Efficiency of Language Model Pre-training for Learning Representation** Arxiv, 2020  
Junmo Kang\*, Suwon Shin\*, **Jeonghwan Kim\***, Jaeyoung Jo\*, Sung-Hyon Myaeng [pdf]
- [7] **Object Classification on raw radar data using convolutional neural networks** IEEE SAS, 2019  
Heejae Han, **Jeonghwan Kim**, Junyoung Park, YuJin Lee, Hyunwoo Jo, Yonghyeon Park, Eric T Matson, Seongha Park [pdf]
- [8] **Towards the development and realization of an undetectable stealth UAV** IEEE IRC, 2019  
Jiyeon Oh, Daeun Choe, Chanhui Yun, **Jeonghwan Kim**, Michael Hopmeier [pdf]

\* indicates equal contribution.

## EXPERIENCES

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### KAIST IR&NLP Lab

Mar. 2022 - Present

#### Research Associate

- Working on Question Answering using Graphs and Semi-parametric Language Modeling.

### Republic of Korea Marine Corps

Mar. 2015 - Dec. 2016

#### Sergeant (*Honorably Discharged*)

- Served as a rifleman for the 31st Battalion.
- Served as an interpreter for the ROK-US Combined Marine Command.

## TEACHINGS

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### Samsung SDS

Aug. 2020 - June. 2021

#### Teaching Assistant

- Taught the Senior DS course at Samsung SDS about SVM, Decision Trees and Advanced NLP models.

### SKKU Global Business School

June. 2021 - Jul. 2021

#### Teaching Assistant

- Served as a TA for the Text Mining course at Sungkyunkwan University (SKKU) about Topic Modeling, Industry-level NLP tools and Advanced NLP models.

### KAIST

Mar. 2021 - Dec. 2021

#### Teaching Assistant

- Served as a TA for the Text Mining course at KAIST about probabilistic approaches in TM (e.g., HMM, CRF) and advanced NLP models.

### Handong Global University

Mar. 2019 - Jun. 2019

#### Teaching Assistant

- Served as a TA for the Data Structures course at Handong Global University (HGU).

## PROJECTS

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### Development of AI Technology to Support Expert Decision-making that can Explain the Reasons/Grounds for Judgement Results Based on Expert Knowledge

Apr. 2022 - Present

#### Funded by Korean Government (Ministry of Science and ICT)

- Developing an efficient open-domain question answering system based on neural sparse representations.

### Development of Context/Number Embedding Based Numerical Reasoning

Jul. 2021 - Dec. 2021

#### Funded by Korean Government (Ministry of Science and ICT)

- Led the development of a numerical reasoning model for question answering (QA) that leverages the non-parametric knowledge of the given context by reducing the over-reliance on parametric knowledge[2].

### ExoBrain

Apr. 2020 - Present

#### Funded by Korean Government (Ministry of Science and ICT)

- Developed a graph-based QA model that leverages the connectivity information of graphs in performing multi-hop reasoning over multiple documents.
- Presented sample-efficient and robust number representations for question answering [3].

### Machine Learning for Context Association and Smart Interaction Suggestion

Apr. 2020 - Mar. 2021

#### Funded by Korean Government (Ministry of Science and ICT)

- Developed a contextualized tag recommendation considering multi-modal contexts (image, location, time, text) in multiple domains (e.g., Instagram, StackOverflow)
- Proposed a novel generation model that takes into account the inter-dependency of tags while alleviating the order sensitivity [4].

## Development of AI-based National Online Petition System for Citizen Deliberation

Apr. 2021 - Dec. 2021

*Funded by KAIST*

- Proposed a pre-trained language model-based online petition system that promotes deliberative writing among the citizens.

## Purdue University - Software Square Fall 2018 Capstone (Advisor: Eric Matson)

Aug. 2018 - Dec. 2018

*Funded by Korean Government (Ministry of Science and ICT)*

- Collected raw radar data on object detection and proposed a CNN-based model for the classification of objects based on raw radar data input [7].
- Devised a stealth UAV (Unmanned Aerial Vehicle) with reduced propeller noise via active noise cancellation module and the capability to navigate autonomously via path planning [8].

## HONORS & AWARDS & GRANTS

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Graduated with Honors in CSE, Handong Global University	2020
Finalist (Top 3), COMEUP2020 AI CHAMPIONSHIP (K-Startup)	2020
Grand Prize, Capstone Graduation Project Festival (Handong Global University, CSEE)	2019
Certificate of Merit, IITP Capstone 9 Program (Purdue University)	2018
Finalist (Top 15), NAVER AI Hackathon (NAVER AI RUSH)	2018
National Science and Technology Scholarship, Korea Student Aid Foundation (KOSAF)	2017

## LANGUAGE PROFICIENCY

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### English (Native)

- TOEFL : 116 (Out of 120).

### Korean (Native)

### Chinese (Limited Proficiency)

## SKILLS

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### Programming Languages

- Python, Pytorch, C/C++, Java, Dart

### Frameworks

- Pytorch, Tensorflow, Theano(Deprecated), Docker, Huggingface, Visualization tools (seaborn, matplotlib), DGL (Deep Graph Library), Natural Language Processing tools (SpaCy, NLTK), OpenCV, Flutter, Firebase