

# Donghyeon Kim

Senior Research Engineer at Hyundai Motor Company AI Research Lab

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<https://donghyeonk.github.io>

## RESEARCH INTERESTS

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Natural Language Processing, Text Mining, Machine Learning, Bioinformatics

## EDUCATION

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**Korea University, Seoul** March 2011 - Feb 2020  
Ph.D. in Computer Science and Engineering (On leave: startups, Oct 2014 - Mar 2018)  
Advisor: Prof. Jaewoo Kang

**Korea University, Seoul** Mar 2003 - Feb 2011  
B.S. in Computer Science Education (On leave: military service, Aug 2006 - Jul 2008)  
Advisor: Prof. Seongbin Park

## EXPERIENCE

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**Hyundai Motor Company** Dec 2019 - Present  
Senior Research Engineer Seoul, Korea

- Natural Language Processing

**Konolabs, Inc.** Apr 2016 - Mar 2018 (Dispatch from Korea Univ. Apr 2016 - Dec 2016)  
Data Scientist & Software Engineer Seoul, Korea

- Event start time prediction by learning online calendar event titles, week contexts and user preferences
- Scheduling related sentence classification
- Email bot architecture design & implementation

**Opinion8, Inc.** Oct 2014 - Apr 2016 (Dispatch from Korea Univ.)  
CTO & Co-founder Seoul, Korea

- Opinion, location, and time based restaurant/attraction/hotel search engine implementation
- Sentiment analysis using dependency trees and part-of-speech tags
- Calculating data, error statistics using MapReduce

**Republic of Korea Marine Corps** Aug 2006 - Jul 2008  
Computer, Signal Corpsman in the 1st division HQ Pohang, Korea

- Military service

## PUBLICATIONS

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**Pre-trained Language Models for Biomedical Question Answering**  
Wonjin Yoon, Jinhyuk Lee, **Donghyeon Kim**, Minbyul Jeong and Jaewoo Kang  
BioASQ Workshop at ECML PKDD, Sep 2019

**BioBERT: a pre-trained biomedical language representation model for biomedical text mining**  
Jinhyuk Lee<sup>†</sup>, Wonjin Yoon<sup>†</sup>, Sungdong Kim, **Donghyeon Kim**, Sunkyu Kim, Chan Ho So and Jaewoo Kang  
Bioinformatics, Sep 2019

### **A Neural Named Entity Recognition and Multi-Type Normalization Tool for Biomedical Text Mining**

**Donghyeon Kim**, Jinhyuk Lee, Chan Ho So, Hwisang Jeon, Minbyul Jeong, Yonghwa Choi, Wonjin Yoon, Mujeen Sung and Jaewoo Kang  
IEEE Access, Jun 2019

### **Learning User Preferences and Understanding Calendar Contexts for Event Scheduling**

**Donghyeon Kim**<sup>†</sup>, Jinhyuk Lee<sup>†</sup>, Donghee Choi, Jaehoon Choi and Jaewoo Kang  
CIKM (full, oral), Oct 2018

### **BEST: Next-Generation Biomedical Entity Search Tool for Knowledge Discovery from Biomedical Literature**

Sunwon Lee<sup>†</sup>, **Donghyeon Kim**<sup>†</sup>, Kyubum Lee, Jaehoon Choi, Seongsoon Kim, Minji Jeon, Sangrak Lim, Donghee Choi, Sunkyu Kim, Aik-Choon Tan and Jaewoo Kang  
PLoS One, Oct 2016

### **Smith Search: Opinion-Based Restaurant Search Engine**

Jaehoon Choi, **Donghyeon Kim**, Donghee Choi, Sangrak Lim, Seongsoon Kim, Youngjae Choi and Jaewoo Kang  
WWW (demo), May 2015

### **Consento: A New Framework for Opinion Based Entity Search and Summarization**

Jaehoon Choi, **Donghyeon Kim**, Seongsoon Kim, Junkyu Lee, Sunwon Lee and Jaewoo Kang  
CIKM (short), Oct 2012

### **BOSS: context-enhanced search for biomedical objects**

Jaehoon Choi, **Donghyeon Kim**, Seongsoon Kim, Sunwon Lee, Kyubum Lee and Jaewoo Kang  
BMC Medical Informatics and Decision Making, Apr 2012

### **Consento: A Consensus Search Engine for Answering Subjective Queries**

Jaehoon Choi, **Donghyeon Kim**, Seongsoon Kim, Junkyu Lee, Sangrak Im, Sunwon Lee and Jaewoo Kang  
WWW (poster), Apr 2012

### **BOSS: a biomedical object search system**

Jaehoon Choi, **Donghyeon Kim**, Seongsoon Kim, Sunwon Lee, Kyubum Lee and Jaewoo Kang  
DTMBIO (long), Oct 2011

<sup>†</sup>Equal contribution

## **DOMESTIC PUBLICATIONS**

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### **언어 모델링에서의 단어의 효율적인 코드북 표현 (Efficient codebook expressions of word representations in language modeling)**

Byungjoo Kim, Yookyung Koh, Chan Ho So, **Donghyeon Kim** and Jaewoo Kang  
Korea Computer Congress, Jun 2018

### **의사결정 지원을 위한 소셜네트워크 서비스의 질의응답 데이터 활용 방안 (Utilizing Social Q&A Data for Decision Making)**

Jukyoung Lee, Jaehoon Choi, **Donghyeon Kim**, Donghee Choi, Minhwan Yoo and Jaewoo Kang  
The 42nd Annual Meeting and Winter Conference of KIISE, Dec 2015

### **소셜 빅데이터를 활용한 의사 결정 검색 기술 (Decision making search technology using social big data)**

Jaehoon Choi, Donghee Choi, **Donghyeon Kim**, Seongsoon Kim, Sangrak Lim and Jaewoo Kang  
Communications of KIISE, Jan 2014

## **AWARDS**

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### **Winner of test batch 1-5, biomedical semantic question answering (Task 7b, Phase B), BioASQ Challenge**

Wonjin Yoon, Jinhyuk Lee, **Donghyeon Kim**, Minbyul Jeong and Jaewoo Kang  
Sep 2019

## The grand prize, Start-up competition, Korea University

Jaehoon Choi, **Donghyeon Kim** and Donghee Choi

Jan 2015

## PATENTS

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### Method, system and non-transitory computer-readable recording medium for providing predictions on calendar

Jaewoo Kang, **Donghyeon Kim**, Jinhyuk Lee and Jaehoon Choi

Application (pending), Korea: 10-2018-0070912, United States: US 2018 / 0174108 A1, Jun 2018

### Method, system and non-transitory computer-readable recording medium for providing schedule-related advertisements

Yun Jeong Min, Jaehoon Choi, **Donghyeon Kim** and Jinhyuk Lee

Application (pending), Korea: 10-2018-0070921, United States: US 2018 / 0174191 A1, Jun 2018

## SERVICE

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**WWW** (2014, 2013), **CIKM** (2011), **ICWSM** (2014), **ICDE** (2014), **ICDM** (2019), **SIAM** (2011), **BIBM** (2018, 2012, 2011)

Secondary reviewer

### Stock study, DMIS Lab., Korea University

Sep 2018 - Jul 2019

Member

- Hybrid Attention Networks (Hu *et al.*, 2018)

<https://github.com/donghyeonk/han>

### Paper re-implementation study, DMIS Lab., Korea University

Jul 2018 - Aug 2018

Study group leader

- Match-LSTM (Wang *et al.*, 2016)

<https://github.com/donghyeonk/match-lstm>

- fastText (Joulin *et al.*, 2016)

<https://github.com/donghyeonk/fastText1607>

### Data Structure (CNCE210), Korea University

Sep 2011 - Feb 2012

Teaching assistant

## SKILLS

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### Programming Language

Python 3, Java 8+

### Natural Language Processing

spaCy, nltk, gensim, Stanford CoreNLP, Google Natural Language, FANSE parser, SentiWordNet, HeidelTime, SentencePiece

### Information Retrieval

Apache Solr, Apache Lucene

### Machine Learning

PyTorch, TensorFlow, Keras, scikit-learn

### Dimension Reduction

t-SNE, UMAP

### Data Analysis & Scientific Computing

pandas, NumPy, SciPy

### MapReduce

Apache Spark, Apache Hadoop

### Database

Amazon DynamoDB, MongoDB, MySQL

### Cloud Computing

Amazon Web Services, Google Cloud Platform, IBM Cloud

### Project Tracking & Deployment

JIRA, Trello, Jenkins, mixpanel

### Visualization

tensorboard, matplotlib, Google Charts, D3.js

## PROJECTS

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컨센서스 질의응답이 가능한 인공지능비서 시스템 개발

Mar '18 - Dec '19

한국연구재단

인공지능 기반 기업형 일정관리 서비스 상용화 중소벤처기업부	Nov '17 - Mar '18
소셜 빅데이터 기반 콘센서스검색 기술 개발 연구성과실용화진흥원	Dec '14 - Dec '16
문헌 및 실험 빅데이터 통합분석 및 탐색 시스템 개발 한국연구재단	Nov '14 - Oct '15
소셜빅데이터분석과 검색기술의 융합을 통한 차세대 콘센서스검색 플랫폼 개발 한국연구재단	Nov '14 - Oct '15
문서 분할 색인 및 콘센서스랭크 모델을 적용한 소셜미디어 의견기반 객체검색 시스템 개발 한국연구재단	May '12 - Apr '15
학술분야 객체검색시스템 개발 정보통신기술진흥센터	Oct '11 - Jun '12
모바일 사진 콘텐츠 분석을 통해 지능형 멀티미디어 SNS 기능을 극대화 하는 Insight Search Engine의 개발 Jun '11 - May '12 중소기업청	
대용량 소셜 미디어의 sentiment 분석을 통한 인사이트 발굴 기술 개발 한국연구재단	Mar '11 - Apr '12

## CERTIFICATES

정보처리기사 한국산업인력공단	May '10
컴퓨터활용능력 1급 대한상공회의소	Feb '10
사무자동화산업기사 한국산업인력공단	Aug '09

## REFERENCE

**Professor Jaewoo Kang**  
College of Informatics, Korea University  
kangj@korea.ac.kr