

David Seunghyun Yoon

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EDUCATION

Seoul National University, Seoul, Korea

Ph.D. in Department of Electrical and Computer Engineering

Aug. 2020

- Advisor: Professor Kyomin Jung
- Thesis: Learning to Rank Texts for Question Answering System Using Deep Neural Networks

Seoul National University, Seoul, Korea

M.S. in Department of Electrical and Computer Engineering

Feb. 2017

- Advisor: Professor Kyomin Jung

Handong Global University, Pohang, Korea

B.S. in Electrical and Electronics Engineering, Mechanical Engineering

Feb. 2006

- Dual Degree
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PROFESSIONAL EXPERIENCES

NLP Research Scientist at **Adobe Research**, San Jose, US

Oct. 2020 – present

Research Scientist Intern at **Adobe Research**, San Jose, US

Sep. 2018 – Dec. 2018

- Sentence-level answer selection model for QA. Published in CIKM-19
- Multimodal speech emotion recognition. Published in ICASSP-19

Staff Engineer at **Samsung Research**, Seoul, Korea

Feb. 2006 – Mar. 2017

- Developed an information retrieval based QA system.
- Developed (front-end, back-end) social service platform.
Filed two international patents. (one is issued)
- Developed concept-prototyping products.
Filed five international patents. (four are issued)

Representative of Employees, Hangajok Council at **Samsung Electronics**, Korea

Jan. 2012 – Jun. 2014

- Participated in labor-management consultation council

Trainer of Global New Employee Course at **Samsung Electronics**, Korea

Jan. 2011 – Jul. 2011

- Served as a trainer of Samsung “global new employee training course” (English)
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ACADEMIC ACTIVITIES

Program Committee

NAACL (from 2019), ACL (from 2020), EMNLP (from 2019), AACL (from 2020), EACL (from 2021), ARR (from 2021), COLING (from 2022)
AAAI (from 2020), WWW (2021, 2022), INTERSPEECH (from 2019), ICLR (from 2024)

Journal Reviewer

Information Processing and Management, 2020

IEEE Signal Processing Letters, 2020

Teaching Assistant

Programming Methodologies, **Seoul National University**

Spring 2018

Machine Learning, **Seoul National University** Fall 2015
 Lab. Sentiment Analysis, BigCamp (Big Data Academy), **Big Data Institute** 2016, 2017, 2018, 2019

Invited Talks

Robust Textual Representation for Text and Multimodal Understanding, Dongguk Univ.	Mar. 2024
Learning Text Representation for NLP Application, Seoul National Univ. , South Korea	Aug. 2023
Pretrained Language Model and Semantic Textual Understanding, SKKU , South Korea	Sep. 2022
Semantic Textual Understanding for Information Retrieval, Seoul National Univ. , South Korea	Aug. 2022
Multimodal Evaluation Metric and Image Captioning Model, Korea Univ. , South Korea	Dec. 2021
Recent Advancements in NLP for QA, LM, and Evaluation Metric, Dongguk Univ. , Korea	Sep. 2020
Understanding Long Texts for Question Answering System Using DNN, KAIST/IBS , Korea	Jul. 2020
Question Answering System for Long Text, Adobe Research , San Jose, US	Aug. 2019
Question Answering System and Multimodal Speech Emotion Recognition, DEEPEST , Korea	Aug. 2019
Research in Natural Language Processing, NVIDIA AI Conference , Korea	Jul. 2019
Question Answering for Short Answer, Adobe Research , San Jose, US	Dec. 2018
QA-pair Ranking Algorithm and Its Applications, NAVER , Korea	Aug. 2018
Learning to Rank Question-Answer Pairs, PyTorch KR , Korea	Jun. 2018
Advancement of the Neural Dialogue Model, Fast Campus , Korea	Jul. 2018

RESEARCH INTERESTS

Question Answering (QA) System

- Recently, I am working on learning sentence representation for natural language processing (NLP) tasks, including QA—published in ACL 2020, NAACL 2021.
- We present a graph neural network-based model that can detect supporting sentences for machine-reading question answering—published in LREC 2020.
- We propose a hierarchical model for understanding lengthy text for QA. In addition, we develop a latent clustering method that analyses and uses topic information in the target dataset as additional information—published in NAALC 2018, CIKM 2019.

Natural Language Processing and Multimodal Information

- We develop multimodal representation-based metrics that compute semantic alignment of image and description—published in ACL 2021.
- We show that usage of multimodal information using deep neural network-based model significantly improve the performance for speech emotion recognition task—published in IEEE SLT 2018, ICASSP 2019, ICASSP 2020, Interspeech 2020.

Natural Language Processing for Social Good

- We are trying to develop an algorithm that can be proactively used to prevent text-related problems in our society. Our first effort begin with developing a model that can detect the abusive language on Twitter—published in EMNLP workshop 2018. We further present research that can detect misleading news headlines—published in AAAI 2019, Disinformation, Misinformation, and Fake News in Social Media-Emerging Research Challenges and Opportunities, Springer 2020, IEEE Access 2021.

PUBLICATIONS

Refereed Conference Publications

* denotes equal contribution.

- [41] Meryem M’hamdi, Jonathan May, Franck Dernoncourt, Trung Bui, **Seunghyun Yoon**, “Multilingual Sentence-Level Semantic Search using Meta-Distillation Learning,” in Proc. of *SIGIR*, 2024.

- [40] Thang M. Pham, Peijie Chen, Tin Nguyen, **Seunghyun Yoon**, Trung Bui, Anh Nguyen, “PEEB: Part-based Bird Classifiers with an Explainable and Editable Language Bottleneck,” in *Proc. of NAACL Findings*, 2024.
- [39] Dawit Mureja Argaw, **Seunghyun Yoon**, Fabian Caba Heilbron, Hanieh Deilamsalehy, Trung Bui, Zhaowen Wang, Franck Dernoncourt, Joon Son Chung, “Scaling Up Video Summarization Pretraining with Large Language Models,” in *Proc. of CVPR*, 2024.
- [38] Hyunjae Kim, **Seunghyun Yoon**, Trung Bui, Handong Zhao, Quan Tran, Franck Dernoncourt, Jaewoo Kang, “Fine-tuning CLIP Text Encoders with Two-step Paraphrasing,” in *Proc. of EACL Findings*, 2024.
- [37] Linzi Xing, Quan Tran, Fabian Caba Heilbron, Franck Dernoncourt, **Seunghyun Yoon**, Zhaowen Wang, Trung Bui, Giuseppe Carenini, “Multi-Modal Video Topic Segmentation with Dual-Contrastive Domain Adaptation,” in *Proc. of Multimedia Modelling*, 2024.
- [36] Zhongfen Deng, **Seunghyun Yoon**, Trung Bui, Franck Dernoncourt, Quan Hung Tran, Shuaiqi Liu, Wenting Zhao, Tao Zhang, Yibo Wang, Philip Yu, “Aspect-based Meeting Transcript Summarization: A Two-Stage Approach with Weak Supervision on Sentence Classification,” in *Proc. of IEEE BigData*, 2023.
- [35] Yongil Kim, Yerin Hwang, Hyeongu Yun, **Seunghyun Yoon**, Trung Bui, Kyomin Jung, “Perturbation Robust Metric for Multi-Lingual Image Captioning,” in *Proc. of the Conference on Empirical Methods in Natural Language Processing (EMNLP)*, 2023.
- [34] Ioana Croitoru, Simion-Vlad Bogolin, Samuel Albanie, Yang Liu, Zhaowen Wang, **Seunghyun Yoon**, Franck Dernoncourt, Hailin Jin, Trung Bui, “Moment Detection in Long Tutorial Videos,” in *Proc. of ICCV*, 2023.
- [33] Viet Lai, Abel Salinas, Hao Tan, Trung Bui, Quan Hung Tran, **Seunghyun Yoon**, Hanieh Deilamsalehy, Franck Dernoncourt, and Thien Nguyen, “Boosting Punctuation Restoration with Data Generation and Reinforcement Learning,” in *Proc. of INTERSPEECH*, 2023.
- [32] Hhynjae Kim, Jaehyo Yoo, **Seunghyun Yoon**, and Jaewoo Kang, “Automatic Creation of Named Entity Recognition Datasets by Querying Phrase Representations,” in *Proc. of the Annual Conference of the Association for Computational Linguistics (ACL)*, 2023.
- [31] Archiki Prasad, Trung Bui, **Seunghyun Yoon**, Hanieh Deilamsalehy, Franck Dernoncourt, and Mohit Bansal, “MEETINGQA: Extractive Question-Answering on Meeting Transcripts,” in *Proc. of the Annual Conference of the Association for Computational Linguistics (ACL)*, 2023.
- [30] T M Pham, **S Yoon**, T Bui and A Nguyen, “PiC: A Phrase-in-Context Dataset for Phrase Understanding and Semantic Search,” to appear in *Proc. of the Conference of the European Chapter of the Association for Computational Linguistics (EACL)*, 2023.
- [29] H Kim, J Yoo, **S Yoon**, J Lee, J Kang, “Simple Questions Generate Named Entity Recognition Datasets,” in *Proc. of the Conference on Empirical Methods in Natural Language Processing (EMNLP)*, 2022.
- [28] Y Seonwoo, **S Yoon**, F Dernoncourt, T Bui, A Oh, “Virtual Knowledge Graph Construction for Zero-Shot Domain-Specific Document Retrieval,” in *Proc. of the International Conference on Computational Linguistics (COLING)*, 2022.
- [27] K Mrini, H Singh, F Dernoncourt, **S Yoon**, T Bui, W W. Chang, E Farcas, N Nakashole, “Medical Question Understanding and Answering with Knowledge Grounding and Semantic Self-Supervision,” in *Proc. of the International Conference on Computational Linguistics (COLING)*, 2022.

- [26] C Salaam, F Deroncourt, T Bui, **S Yoon**, “Offensive Content Detection Via Synthetic Code-Switched Text,” in *Proc. of the International Conference on Computational Linguistics (COLING)*, 2022.
- [25] A Pouran Ben Veyseh, Q Hung Tran, **S Yoon**, V Manjunatha, H Deilamsalehy, R Jain, T Bui, W W. Chang, F Deroncourt, T Huu Nguyen, “Keyphrase Prediction from Video Transcripts: New Dataset and Directions,” in *Proc. of the International Conference on Computational Linguistics (COLING)*, 2022.
- [24] A Pouran Ben Veyseh, N Meister, **S Yoon**, R Jain, F Deroncourt, T Huu Nguyen, “MACRONYM: A Large-Scale Dataset for Multilingual and Multi-Domain Acronym Extraction,” in *Proc. the International Conference on Computational Linguistics (COLING)*, 2022.
- [23] J Cho, **S Yoon**, A Kale, F Deroncourt, T Bui, M Bansal, “Fine-grained Image Captioning with CLIP Reward,” in *Proc. of the Findings of Annual Conference of the North American Chapter of the Association for Computational Linguistics (NAACL)*, 2022.
- [22] A Maharana, QH Tran, **S Yoon**, F Deroncourt, T Bui, W Chang, M Bansal, “Multimodal Intent Discovery from Livestream Videos,” in *Proc. of the Findings of Annual Conference of the North American Chapter of the Association for Computational Linguistics (NAACL)*, 2022.
- [21] H Kim, DS Kim, **S Yoon**, F Deroncourt, T Bu, M Bansal, “CAISE: Conversational Agent for Image Search and Editing,” in *Proc. of AAAI Conference on Artificial Intelligence (AAAI)*, 2022. (Acceptance Rate=15%)
- [20] J Zhang, T Bui, **S Yoon**, X Chen, Z Liu, C Xia, QH Tran, W Chang, P Yu, “Few-Shot Intent Detection via Contrastive Pre-Training and Fine-Tuning,” in *Proc. of the Conference on Empirical Methods in Natural Language Processing (EMNLP)*, 2021. (Acceptance Rate=11.6%)
- [19] H Lee, T Scialom, **S Yoon**, F Deroncourt, K Jung, “QACE: Asking Questions to Evaluate an Image Caption,” in *Proc. of the Findings of Empirical Methods in Natural Language Processing (EMNLP-Findings)*, 2021.
- [18] H Lee, **S Yoon**, F Deroncourt, T Bui, K Jung, “UMIC: An Unreferenced Metric for Image Captioning via Contrastive Learning,” in *Proc. of the Annual Conference of the Association for Computational Linguistics (ACL)*, 2021. (Acceptance Rate=14.5%)
- [17] K Mrini, F Deroncourt, **S Yoon**, T Bui, W Chang, E Farcas, N Nakashole, “A Gradually Soft Multi-Task and Data-Augmented Approach to Medical Question Understanding,” in *Proc. of the Annual Conference of the Association for Computational Linguistics (ACL)*, 2021. (Acceptance Rate=21.3%)
- [16] H Lee, **S Yoon**, F Deroncourt, DS Kim, T Bui, J Shin, K Jung, “KPQA: A Metric for Generative Question Answering Using Keyphrase Weights,” in *Proc. of the Annual Conference of the North American Chapter of the Association for Computational Linguistics (NAACL)*, 2021. (Acceptance Rate=28%)
- [15] Y Lee, **S Yoon**, K Jung, “Multimodal Speech Emotion Recognition using Cross Attention with Aligned Audio and Text,” in *Proc. of the Annual Conference of the International Speech Communication Association (INTERSPEECH)*, 2020.
- [14] J Shin, Y Lee, **S Yoon**, K Jung, “Fast and Accurate Deep Bidirectional Language Representations for Unsupervised Learning,” in *Proc. of the Annual Meeting of the Association for Computational Linguistics (ACL)*, 2020. (Acceptance Rate=25.2%)

- [13] **S Yoon**, F Dernoncourt, DS Kim, T Bui, K Jung, “Propagate-Selector: Detecting Supporting Sentences for Question Answering via Graph Neural Networks,” in *Proc. of the International Conference on Language Resources and Evaluation (LREC)*, 2020.
- [12] H Kwak, M Lee, **S Yoon**, J Chang, S Park, K Jung, “Drug-disease Graph: Predicting Adverse Drug Reaction Signals via Graph Neural Network with Clinical Data,” in *Proc. of the Pacific-Asia Conference on Knowledge Discovery and Data Mining (PAKDD)*, 2020. (Oral Presentation, Acceptance Rate=21%)
- [11] **S Yoon**, S Dey, H Lee, K Jung, “Attentive Modality Hopping Mechanism for Speech Emotion Recognition,” in *Proc. of the IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*, 2020. (Oral Presentation)
- [10] **S Yoon**, F Dernoncourt, DS Kim, T Bui, K Jung, “A Compare-Aggregate Model with Latent Clustering for Answer Selection,” in *Proc. of the ACM International Conference on Information and Knowledge Management (CIKM)*, 2019. (Oral Presentation, Acceptance Rate=21%)
- [9] **S Yoon**, S Byun, S Dey, K Jung, “Speech Emotion Recognition Using Multi-hop Attention Mechanism,” in *Proc. of the IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*, 2019. (Oral Presentation)
- [8] S Byun, **S Yoon**, K Jung, “Neural Networks for Compressing and Classifying Speaker-Independent Paralinguistic Signals,” in *Proc. of the IEEE International Conference on Big Data and Smart Computing (BigComp)*, 2019. (Oral Presentation)
- [7] **S Yoon***, K Park*, J Shin, H Lim, S Won, M Cha, K Jung, “Detecting Incongruity Between News Headline and Body Text via a Deep Hierarchical Encoder,” in *Proc. of the AAAI Conference on Artificial Intelligence (AAAI)*, 2019. (Oral Presentation, Acceptance Rate=16%)
- [6] **S Yoon**, J Shin, K Jung, “Learning to Rank Question-Answer Pairs using Hierarchical Recurrent Encoder with Latent Topic Clustering,” in *Proc. of Annual Conference of the North American Chapter of the Association for Computational Linguistics (NAACL)*, 2018. (Acceptance Rate=31%)
- [5] J Shin, Y Kim, **S Yoon**, K Jung, “Contextual-CNN: A Novel Architecture Capturing Unified Meaning for Sentence Classification,” in *Proc. of the IEEE International Conference on Big Data and Smart Computing (BigComp)*, 2018. (Oral Presentation)
- [4] **S Yoon**, P Estrada, K Jung, “Synonym Discovery with Etymology-based Word Embeddings,” in *Proc. of the IEEE Symposium Series on Computational Intelligence (SSCI)*, 2017.
- [3] **S Yoon**, M Sundar, A Gupta, K Jung, “Automatic Question Answering System for Consumer Products,” in *Proc. of SAI Intelligent Systems Conference. Springer, Cham*, 2016.
- [2] K Park, J Kim, J Park, M Cha, J Nam, **S Yoon**, E Rhim, “Mining the Minds of Customers from Online Chat Logs,” in *Proc. of the ACM International Conference on Information and Knowledge Management (CIKM)*, 2015. (Acceptance Rate=21%)
- [1] **S Yoon**, K Lee, H Shin, “Media clips: Implementation of an intuitive media linker,” in *Proc. of IEEE International Symposium on Broadband Multimedia Systems and Broadcasting (BMSB)*, 2011.

Journal Publications and Book

- [5] **S Yoon***, K Park*, M Lee, T Kim, M Cha, K Jung, “Learning to Detect Incongruence in News Headline and Body Text via a Graph Neural Network,” in *IEEE Access*, 2021. (SCIE, IF=3.745)

- [4] Y Kim, S Won, **S Yoon**, K Jung, “Collaborative Training of GANs in Continuous and Discrete Spaces for Text Generation,” in *IEEE Access*, 2021. (SCIE, IF=3.745)
- [3] S Byun*, **S Yoon***, K Jung, “Comparative Studies on Machine Learning for Paralinguistic Signal Compression and Classification,” in *Journal of Supercomputing*, 2020. (SCI, IF=2.157)
- [2] K Park, T Kim, **S Yoon**, M Cha, K Jung, “BaitWatcher: A lightweight web interface for the detection of incongruent news headlines,” in *Fake News, Disinformation, and Misinformation in Social Media: Emerging Research Challenges and Opportunities*, Springer, 2020.
- [1] **S Yoon**, E Rhim, D Kim, “Domain Question Answering System,” in *KIISE Transactions on Computing Practices*, 2015.

Peer Reviewed Workshops

- [10] H Lee, C Park, **S Yoon**, T Bui, F Dernoncourt, J Kim, K Jung, “Factual Error Correction for Abstractive Summaries Using Entity Retrieval,” in *Proc. of the Empirical Methods in Natural Language Processing (EMNLP) Workshop on GEM*, 2022.
- [9] Y Kim, Y Hwang, **S Yoon**, H Yun, K Jung, “Improving cross-modal attention via object detection,” in *Proc. of the Conference on Neural Information Processing Systems (NeurIPS) Workshop on All Things Attention*, 2022.
- [8] H Choi, Y Yoon, **S Yoon**, K Park, “How does fake news use a thumbnail? CLIP-based Multi-modal Detection on the Unrepresentative News Image,” in *Proc. the Annual Conference of the North American Chapter of the Association for Computational Linguistics (NAACL) Workshop on CONSTRAINT*, 2022.
- [7] K Mrini, F Dernoncourt, **S Yoon**, T Bui, W Chang, E Farcas, N Nakashole, “UCSD-Adobe at MEDIQA 2021: Transfer Learning and Answer Sentence Selection for Medical Summarization,” in *Proc. of the Annual Conference of the North American Chapter of the Association for Computational Linguistics (NAACL) Workshop on BioNLP*, 2021.
- [6] H Lee, **S Yoon**, K Jung, “ViLBERTScore: Evaluating Image Caption Using Vision-and-Language BERT,” in *Proc. of the Empirical Methods in Natural Language Processing (EMNLP) Workshop on Eval4NLP*, 2020.
- [5] H Lee, **S Yoon**, K Jung, “DSTC8-AVSD: Multimodal Semantic Transformer Network with Retrieval Style Word Generator,” in *Proc. of the AAAI Conference on Artificial Intelligence (AAAI) Workshop on DSTC8*, 2020.
- [4] J Nam, **S Yoon**, K Jung, “Surf at mediqa 2019: Improving performance of natural language inference in the clinical domain by adopting pre-trained language model,” in *Proc. of Association for Computational Linguistics (ACL) Workshop on BioNLP*, 2019.
- [3] **S Yoon**, S Byun, K Jung, “Multimodal Speech Emotion Recognition using Audio and Text,” in *Proc. of the IEEE Workshop on Spoken Language Technology (SLT)*, 2018.
- [2] Y Lee*, **S Yoon***, K Jung, “Comparative Studies of Detecting Abusive Language on Twitter,” in *Proc. of Empirical Methods in Natural Language Processing (EMNLP) Workshop on Abusive Language Online*, 2018.
- [1] **S Yoon**, H Yun, Y Kim, G Park, K Jung, “Efficient Transfer Learning Schemes for Personalized Language Modeling using Recurrent Neural Network,” in *Proc. of the AAAI Conference on Artificial*

Intelligence (AAAI) Workshop on Crowdsourcing, Deep Learning and Artificial Intelligence Agents, 2017.

HONORS AND AWARDS

Distinguished Ph.D. Dissertation Award , Seoul National University, Korea	2020
Samsung Scholarship for Graduate Study , Samsung Electronics	2015, 2016
Best Paper Presentation , Korea Computer Congress	2014
Samsung Award for Outstanding Individual Performance , Samsung Electronics	2013
Google Conference and Travel Scholarships	2019, 2020

INTERNATIONAL PATENTS

- [10] **S Yoon**, F Deroncourt, DS Kim, T Bui, “Utilizing a graph neural network to identify supporting text phrases and generate digital query responses,” *issued patent*, : *US 11,271,876*, Mar. 8, 2022
- [9] T Bui, S Dey, **S Yoon**, “Utilizing bi-directional recurrent encoders with multi-hop attention for speech emotion recognition,” *issued patent*, : *US 11,205,444*, Dec. 21, 2021
- [8] **S Yoon**, F Deroncourt, T Bui, DS Kim, CI Dockhorn, Y Gong, “Answer selection using a compare-aggregate model with language model and condensed similarity information from latent clustering,” *issued patent*, : *US 11,113,323*, Sep. 7, 2021
- [7] Y Kim, O Kwon, S Kim, H Oh, **S Yoon** S Cha, J Lee, “Terminal apparatus, server and method of controlling the same,” *issued patent*, *US 10,084,850*, *AU2014200631B2*, *CN104104766A*, Sep. 25, 2018
- [6] E Rhim, J Kim, J Nam, **S Yoon**, K Park, J Park, M Cha, “Device and method for analyzing user emotion,” *pending patent*, *WO/2016/182393/KR1020160058782*, May. 13, 2016
- [5] J Nam, M Lee, M Koo, **S Yoon**, “Method of recommending application, mobile terminal using the method, and communication system using the method,” *issued patent*, *US 9,247,376*, Jan. 26, 2016
- [4] **S Yoon**, M Lee, “Method and apparatus for displaying photo on screen having any shape,” *issued patent*, *US 9,049,383*, Jun. 2, 2015
- [3] **S Yoon**, M Lee, M Koo, J Nam, “Method and apparatus for providing information and computer readable storage medium having a program recorded thereon for executing the method,” *issued patent*, *US 8,958,824*, Feb. 17, 2015
- [2] **S Yoon**, M Lee, M Koo, J Nam, “Apparatus and method for clipping and sharing content at a portable terminal,” *issued patent*, *CN103827913A*, *US 13/629,394*, *EP3370172A1*, *WO2013048091A2*, May. 28, 2014
- [1] **S Yoon**, S Kim, “Method and apparatus for fast tracking position by using global positioning system,” *issued patent*, *US 8,094,070*, Jan. 10, 2012

KOREAN
PATENTS

- [9] K Jung, J Shin, **S Yoon**, “Apparatus and method for evaluating sentence by using bidirectional language model,” *issued patent*, KR10-2436900, Aug. 23, 2022
 - [8] K Jung, Y Lee, **S Yoon**, “Method and apparatus for emotion recognition based on cross attention model,” *issued patent*, KR 10-2365433, Feb. 16, 2022
 - [7] K Jung, **S Yoon**, J Shin, H Kwak, S Byun, “Artificial intelligence based dialog system and response control method thereof,” *issued patent*, KR 10-2059015, Dec. 18, 2019
 - [6] Y Kim, O Kwon, S Kim, H Oh, **S Yoon**, S Cha, J Lee, “Terminal apparatus, server and method of controlling the same,” *issued patent*, KR 10-1832394, Feb. 20, 2018
 - [5] **S Yoon**, J Nam, M Koo, M Lee, “Apparatus and method for collecting information of destination in portable terminal,” *issued patent*, KR 10-1914632, Oct. 29, 2018
 - [4] **S Yoon**, M Lee, M Koo, J Nam, “Method and apparatus for providing information, and computer readable storage medium,” *issued patent*, KR 10-1773167, Aug. 24, 2017
 - [3] J Nam, M Lee, M Koo, **S Yoon**, “Method for recommendation of application, mobile terminal thereof and communication system thereof,” *issued patent*, KR 10-1747303, Jun. 8, 2017
 - [2] E Rhim, J Kim, J Nam, **S Yoon**, K Park, J Park, M Cha, “Device and method for analyzing user emotion,” *pending patent*, KR 1020160058782, May. 13, 2016
 - [1] **S Yoon**, S Kim, “Method and apparatus for fast positioning using global positioning system,” *issued patent*, KR 10-1564938, Oct. 27, 2015
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SKILLS

Excellence in Programming Languages: Java, C++, Python
Excellence in Deep Learning Framework: TensorFlow, PyTorch
Fluency in Front-end Sever Design: Apache Tomcat, Spring Framework, AWS, Linux
Familiarity with Back-end Sever Design: NoSQL