David Seunghyun Yoon

Mobile: +1-408-759-0157
E-mail: mysmilesh@gmail.com
Website: http://david-yoon.github.io

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

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)

ACADEMIC ACTIVITIES

Program Committee

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

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

Mutimodal Evaluation Metric and Image Captioning Model, **Korea Univ.**, 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.

[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," to appear in *the Conference on Empirical Methods in Natural Language Processing (EMNLP)*, 2021.

[19] H Lee, T Scialom, **S Yoon**, F Dernoncourt, K Jung, "QACE: Asking Questions to Evaluate an Image Caption," to appear in *the Findings of Empirical Methods in Natural Language Processing (EMNLP-Findings)*, 2021.

[18] H Lee, **S Yoon**, F Dernoncourt, T Bui, K Jung, "UMIC: An Unreferenced Metric for Image Captioning via Contrastive Learning," to appear in *the Annual Conference of the Association for Computational Linguistics (ACL)*, 2021.

[17] K Mrini, F Dernoncourt, **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.

[16] H Lee, **S Yoon**, F Dernoncourt, 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.

[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 *Porc. 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 on 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 Networ," 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

[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 uing 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 Dernoncourt, DS Kim, T Bui, "Utilizing a graph neural network to identify supporting text phrases and generate digital query responses," *pending patent, : US 2021/0058345*, Feb. 25, 2021

[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 Dernoncourt, 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, 2020

[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, Y Lee, **S Yoon**, "Method and apparatus for emotion recognition based on cross attention model," *pending patent, KR10200138372*, Dec. 23, 2020

[8] K Jung, J Shin, **S Yoon**, "Apparatus and method for evaluating sentense by using bidirectional language model," *pending patent, KR1020190165712*, Dec. 12, 2019

[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 1020190165712*, 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

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