

## Research Interests

My research interests are in machine learning and natural language processing. In particular, I work in probabilistic Bayesian topic models and artificial neural networks to simulate and discover latent patterns such as human behaviors in unannotated data such as conversational corpora<sup>1</sup>.

## Employment

**Assistant Professor**, Sungkyunkwan University (SKKU), Suwon, South Korea, Sep 2020 - Present  
I am working as a professor in the College of Computing and Informatics at Sungkyunkwan University. I am the leader of the Human Language Intelligence Lab.

**Junior Data Scientist**, United Nations Global Pulse Lab, Jakarta, Indonesia, June 2016 - Aug 2016  
I interned with Jonggun Lee in the United Nations Global Pulse Lab Jakarta. I developed a topic model based methodology for expanding relevant keywords for specific subjects to identify related tweets in Twitter. This work is published at ICML 2017 workshop [11].

**Research Intern**, Microsoft Research Asia, Beijing, China, Sep 2013 - Feb 2014  
I interned with Chin-Yew Lin in the Knowledge Mining group at Microsoft Research Asia. I developed a topic model to identify self-disclosure in Twitter conversations. This work is published at EMNLP 2014 as a full paper [13].

## Education

KAIST, Ph.D., School of Computing, Mar 2013 - Aug 2020  
Dissertation: Speaker oriented Conversation Model and its Evaluation [4]  
Dissertation committee: Prof. Alice Oh, Dr. Chin-Yew Lin, Prof. Kee-Eung Kim,  
Prof. Meeyoung Cha, and Prof. Sung-Hyon Myaeng  
Outstanding PhD Thesis Award

KAIST, M.S., Computer Science, Feb 2011 - Feb 2013  
GPA: 3.98/4.30  
Thesis: Distributed Online Learning for Topic Models [14]  
Thesis committee: Prof. Alice Oh, Prof. Sung-Eui Yoon, and Prof. Sung-Hyon Myaeng

Sungkyunkwan University, B.S., Computer Engineering, Mar 2004 - Feb 2011  
GPA: 4.45/4.50  
Graduation project: On-Line LECTURE Allocation<sup>2</sup>, Worked with Byung Il Woo,  
Best Project Award

## Publications

- [1] YunSeok Choi, **JinYeong Bak**, CheolWon Na, and Jee-Hyong Lee. Learning sequential and structural information for source code summarization. In *Findings of the Association for Computational Linguistics: ACL-IJCNLP 2021*, Online, August 2021. Association for Computational Linguistics.
- [2] **JinYeong Bak** and Alice Oh. A Leader's Final Decision Classification Model Tested on Meeting Records with BERT. In *Journal of KIISE*, volume 48, 2021.

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<sup>1</sup>Full research statement: [https://nosyu.kr/assets/JinYeong\\_Bak\\_ResearchStatement.pdf](https://nosyu.kr/assets/JinYeong_Bak_ResearchStatement.pdf)

<sup>2</sup>Online system for lecture allocation and mileage management

- [3] Bonggun Shin, Sungsoo Park, **JinYeong Bak**, and Joyce C. Ho. Controlled molecule generator for optimizing multiple chemical properties. In *Proceedings of the Conference on Health, Inference, and Learning*, 2021.
- [4] **JinYeong Bak**. Speaker oriented conversation model and its evaluation. PhD dissertation, KAIST, Daejeon, South Korea, 2020.
- [5] **JinYeong Bak** and Alice Oh. Speaker sensitive response evaluation model. In *Proceedings of the 58th Annual Meeting of the Association for Computational Linguistics*, 2020.
- [6] **JinYeong Bak** and Alice Oh. Variational hierarchical user-based conversation model. In *Proceedings of the 2019 Conference on Empirical Methods in Natural Language Processing*, 2019.
- [7] **JinYeong Bak** and Alice Oh. Conversational decision-making model for predicting the king's decision in the annals of the Joseon dynasty. In *Proceedings of the 2018 Conference on Empirical Methods in Natural Language Processing*, 2018.
- [8] Gabriel Lima and **JinYeong Bak**. Speech emotion classification using raw audio input and transcriptions. In *Proceedings of the 2018 International Conference on Signal Processing and Machine Learning*, 2018.
- [9] Sungjoon Park, **JinYeong Bak**, and Alice Oh. Rotated word vector representations and their interpretability. In *Proceedings of the 2017 Conference on Empirical Methods in Natural Language Processing*, 2017.
- [10] Jongin Lee, Daeki Cho, Junhong Kim, Eunji Im, **JinYeong Bak**, Kwan Hong Lee, John Kim, and others. Itchtector: A wearable-based mobile system for managing itching conditions. In *Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems*. ACM, 2017.
- [11] **JinYeong Bak**, Imaduddin Amin, Jong Gun Lee, and Alice Oh. Keyword expansion for understanding crisis events in Indonesian tweets. In *ICML Workshop on Interactive Machine Learning and Semantic Information Retrieval*, 2017.
- [12] **JinYeong Bak** and Alice Oh. Five centuries of monarchy in Korea: Mining the text of the annals of the Joseon dynasty. In *Proceedings of the 9th SIGHUM Workshop on Language Technology for Cultural Heritage, Social Sciences, and Humanities (LaTeCH)*, 2015.
- [13] **JinYeong Bak**, Chin-Yew Lin, and Alice Oh. Self-disclosure topic model for classifying and analyzing Twitter conversations. In *Proceedings of the 2014 Conference on Empirical Methods in Natural Language Processing*, 2014.
- [14] **JinYeong Bak**. Distributed online learning for topic models. Master's thesis, KAIST, Daejeon, South Korea, 2012.
- [15] **JinYeong Bak**, Dongwoo Kim, and Alice Oh. Distributed online learning for latent Dirichlet allocation. In *Proceedings of Workshop on Big Learning : Algorithms, Systems, and Tools at the Neural Information Processing Systems*, 2012.
- [16] **JinYeong Bak**, Suin Kim, and Alice Oh. Self-disclosure and relationship strength in Twitter conversations. In *Proceedings of the 50th Annual Meeting of the Association for Computational Linguistics*, 2012.
- [17] Suin Kim, **JinYeong Bak**, and Alice Oh. Do you feel what I feel? social aspects of emotions in Twitter conversations. In *Proceedings of the AAAI International Conference on Weblogs and Social Media*, 2012.
- [18] Suin Kim, **JinYeong Bak**, Yohan Jo, and Alice Oh. Do you feel what I feel? social aspects of emotions in twitter conversations. In *Proceedings of Workshop on Computational Social Science and the Wisdom of Crowds*, 2011.
- [19] Rae Young Ko, Duk Sun Kim, **JinYeong Bak**, and Sang Gu Lee. Development of mobile sage-math and its use in linear algebra. In *J. Korea Soc. Math. Ed. Ser. E: Communications of Mathematical Education*, 2009.
- [20] Duk Sun Kim, **JinYeong Bak**, and Sang Gu Lee. The educational models using enhanced mathematics ict in the Korean it environments. In *J. Korea Soc. Math. Ed. Ser. E: Communications of Mathematical Education*, 2008.

**Academic Services - Reviewer and Program Committee**

[AAAI] 2020, 2021, 2022  
[AAACL] 2020  
[ACL] 2015, 2016, 2017, 2018, 2019, 2020, 2021  
[ACML] 2016  
[ARR] July/Sep 2021  
[COLING] 2020  
[EACL] 2016  
[EMNLP] 2015, 2016, 2019, 2020, 2021  
[ICLR] 2021, 2022  
[ICML] 2020  
[ICWSM] 2015, 2016  
[JOK] 2020, 2021  
[LaTeCH-CLfL] 2016, 2017, 2018, 2019, 2020, 2021  
[NAACL] 2019, 2021  
[NeurIPS] 2021  
[SAC] 2021  
[TACL] 2019  
[The Web Conference] 2019, 2020  
[W-NUT] 2020, 2021

**Academic Services - Others**

Mentor of group mentoring, ACL 2020  
Volunteer of birds of a feather meetup, ACL 2020  
Volunteer of micro-blogging, ACL 2020  
Session chair, POLTEXT 2019  
Student volunteer, ACL 2012, EMNLP 2018, EMNLP 2019, ICLR 2020

**Projects**

“National Program for Excellence in SW”, IITP, Apr 2021 - NOW  
“A study on automatic evaluation model for generated natural language texts in terms of topic consistency”, NRF, June 2021 - NOW

“Digital SOC D.N.A. based Health Care Laboratory for Carbon Neutralization”, NRF, June 2021 - NOW

“Development of Digital Therapeutics for Depression from COVID19”, KEIT, June 2021 - NOW

“Standard Development of Blockchain based Network Management Automation Technology”, IITP, Sep 2020 - May 2021

“Artificial Intelligence Graduate School Program”, IITP, Sep 2020 - NOW

“Explainable Human-level Deep Machine Learning”, IITP, Sep 2017 - Aug 2020

“Machine Learning Center”, IITP, Mar 2013 - Mar 2017

“Distributed online topic modeling for big data analysis”, Samsung Electronics, Dec 2012 - Nov 2013

### Teaching Experience

Lecturer, “Bayesian Learning”, SKKU, Spring 2021

Lecturer, “Natural Language Processing”, SKKU, Spring 2021

Lecturer, “Natural Language Processing”, DSME, {Oct 2020, June 2021}

Lecturer, “Probability and Random Process”, SKKU, {Fall 2020, Spring 2021}

Lecturer, “Artificial Intelligence for Data Scientists”, elice, {Apr 2017 - Aug 2017, Jun 2018 - Sep 2018}

Teaching assistant, “Artificial Intelligence and Machine Learning”, KAIST, {Fall 2011, Spring 2013, Spring 2015, Fall 2018}

Teaching assistant, “Introduction to Programming”, KAIST, {Spring/Fall 2014, Fall 2015, Spring/Fall 2016, Spring/Fall 2017}

Teaching assistant, “IT Convergence User-centered Service Design”, KAIST - Microsoft Design Expo, Spring 2015

Teaching assistant, “Operating Systems”, SKKU, Fall 2010

Teaching assistant, “Discrete Mathematics”, SKKU, Spring 2010

### Talks

“Evaluation and Scalability of Conversation models”, Korea Institute of Science and Technology Information, Daejeon, South Korea, 2021.08.20.

“Automatic evaluation methods for conversation models”, SOCAR, Seoul, South Korea, 2021.07.28.

“Automatic evaluation methods for conversation models”, 2021 Summer Conference, Korean Artificial Intelligence Association, Online, 2021.07.09.

“2021 NLP Research Trends”, CJ Olive Networks, Seoul, South Korea, 2021.06.08.

“Automatic evaluation methods for conversation models”, AI Frontiers Summit 2021, The Korean Institute of Communications and Information Sciences, Seoul, South Korea, 2021.05.21.

“Scaling laws in Natural Language Processing”, 2021 Spring Colloquium, SKKU Department of

Physics, Suwon, South Korea, 2021.03.03.

“Conversation Model and its Evaluation”, 2020 Fall Conference, Korean Artificial Intelligence Association, Online, 2020.11.20.

“Speaker-oriented Conversation Model and its Evaluation”, Online Seminar, Dongguk University, Seoul, South Korea, 2020.11.18.

“Speaker-oriented Conversation Model and its Evaluation”, BK21 Artificial Intelligence Colloquium, Ajou University, Online, 2020.11.10.

“Speaker-oriented Conversation Model and its Evaluation”, Fall 2020 CSE GSAI Seminar Series, Postech, Online, 2020.09.09.

“Speaker-oriented Conversation Model and its Evaluation”, Machine Learning for Language, NYU, Online, 2020.06.16.

“Variational Hierarchical User-based Conversation Model”, KAIST-NAVER Clova AI Workshop, KAIST, Daejeon, South Korea, 2019.06.19.

“Conversational decision-making model for predicting the kings decision in the annals of the Joseon dynasty”, NAVER, Seongnam, South Korea, 2018.12.14.

“Conversational decision-making model for predicting the kings decision in the annals of the Joseon dynasty and Word vector Interpretability”, Samsung Electronics, Suwon, South Korea, 2018.11.30.

“Self-disclosure in Twitter conversations”, Qatar Computing Research Institute, Doha, Qatar, 2014.10.23.

“Bayesian Nonparametric Topic Modeling”, Korean machine learning summer school, Seoul, South Korea, 2013.08.22.

## **Programming Skills**

Language: Python, Java, C++, C, PHP, JavaScript

Library: TensorFlow, PyTorch, NumPy, scikit-learn, KoNLPy

GitHub repositories: <https://github.com/NoSyu>

## **Extracurricular Activities**

Advisory committee member, Korea Tourism Organization, 2021

Students representative of department of computer science in student council, KAIST, 2014

Social service personnel, Banyeo library, Busan, South Korea, May 2005 - July 2007

Member and representative, Linux & Open-source learned club (SKKULUG), SKKU, 2004 - 2010

## **References**

Prof. Alice Haeyun Oh, KAIST, [alice.oh@kaist.edu](mailto:alice.oh@kaist.edu)

Mr. Byung Il Woo, SK C&C, [outerlight@gmail.com](mailto:outerlight@gmail.com)

Dr. Chin-Yew Lin, Microsoft Research, [cyl@microsoft.com](mailto:cyl@microsoft.com)

Prof. Eunseok Lee, SKKU, [leees@skku.edu](mailto:leees@skku.edu)

Dr. Jonggun Lee, SOCAR, [jonggunlee@gmail.com](mailto:jonggunlee@gmail.com)

Prof. Sang Gu Lee, SKKU, [sglee@skku.edu](mailto:sglee@skku.edu)