

Yoon Kyung Lee

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Research Interests

Empathic AI, Emotion, Affective Science/Modeling, Natural Language Processing, Social Intelligence of AI, Human-Robot Interaction, Human Factors.

Current Title

- **Senior Researcher**, Institute of Psychological Science, *Seoul National University*, 24'-

Professional Experience

- **Social Science/Humanities Research Professional**, *University of Texas Austin*, 23'-24'
- **Lecturer**, Cognitive Psychology, *Samsung Art and Design Institute*, June to Sep 2022

Education

- Ph.D. in Cognitive Psychology (Minor: Quantitative Psychology), *Seoul National University*, Korea 2024
- Visiting Ph.D. Cand., *U of Texas at Austin*, 2023-2024
- M.A. in Cognitive Psychology, *Seoul National University*, Korea
- B.S. in Psychology, *The University of Iowa*, IA, USA

Publications

- **Lee, YK.**, Suh, J., Zhan, H., Li, J.J., & Ong, D.C. (2024). Large Language Models Produce Responses Perceived to be Empathic. *The 12th International Conference on Affective Computing & Intelligent Interaction (ACII 2024)* [[pdf](#)]
- **Lee, YK.**, Lee, I., Shin, M., Bae, S., & Hahn, S. (2024). Enhancing Empathic Reasoning of Large Language Models Based on Psychotherapy Models for AI-assisted Social Support. *Korean J of Cognitive Science*, 35(1), 23-48. [[pdf](#)]
- Zhan, H., Zheng, A., **Lee, YK.**, Suh, J., Li, J.J., & Ong, D.C. (2024). Large Language Models are Capable of Offering Cognitive Reappraisal, if Guided. *The 1st Conference of Language Modeling (COLM 2024)*. [[pdf](#)]
- Bae, S., **Lee, YK.**, Lee, J., Kim, J., Jeon, H., Lim, S., Kim, B., & Hahn, S. (2024). Enhancing Empathy in Virtual Reality: An Embodied Approach to Mindset Modulation. *arXiv preprint*. [[pdf](#)]
- **Lee, YK.**, Lee, I., Shin, M., Bae, S., & Hahn, S. (2023). Chain of Empathy: Enhancing Empathetic Response of Large Language Models Based on Psychotherapy Models. *arXiv preprint arXiv:2311.04915*. [[pdf](#)]

- **Lee YK.**, Jung, Y., Kang, K., & Hahn, S. (2023). Developing Social Robots with Empathetic Non-Verbal Cues Using Large Language Models. Late Breaking Report for presentation at the *32nd IEEE International Conference on Robot and Human Interactive Communication (RO-MAN 2023)*. [\[pdf\]](#)
- **Lee YK.**, Park, Y., Shin, M., & Hahn, S. (2023). Effect of Factual and Empathetic Feedback Styles in Robotic Fitness Coaching on Exercise Behavior Change. Late Breaking Report for presentation at the *32nd IEEE International Conference on Robot and Human Interactive Communication (RO-MAN 2023)*.
- **Lee, YK.**, Park, Y. H., & Hahn, S. (2023). A Portrait of Emotion: Empowering Self-Expression through AI-Generated Art. *Proceedings of the Annual Meeting of the Cognitive Science Society (abstract)*. arXiv preprint arXiv:2304.13324. [\[pdf\]](#)
- Bae, S., **Lee, YK.**, & Hahn, S. (2023). Friendly-Bot: The Impact of Chatbot Appearance and Relationship Style on User Trust. In *Proceedings of the Annual Meeting of the Cognitive Science Society* (Vol. 45, No. 45). [\[pdf\]](#)
- Kim, J., Jung, Y., **Lee, YK.**, & Hahn, S. (2023). Relationship Between Perspective-Taking Ability and Psychological and Emotional Characteristics Observed in a Large Emotion Diary Dataset: A Cluster Analysis. *Korean Journal of Health Psychology*, 28(1), 1-25.
- **Lee, YK** & Cho, WI., Bae, S., Choi, H., Park, J., Kim, N., & Hahn, S. (2022). “Feels like I’ve Known You Forever”: Empathy and Self-Awareness in Human Open-Domain Dialogs. *Cognitive Science Society (CogSci) 2022*. [\[pdf\]](#) [\[abstract\]](#)
- Cho, WI* & **Lee, YK***, Bae, S., Kim, JW., Park, SA., Kim, MS., Hahn, S., & Kim, N. (2022). “When Crowd Meets Persona: Creating a Large-Scale Open-Domain Persona Dialogue Corpus. *2022 Tenth AAAI Conference on Human Computation and Crowdsourcing (Work-in-Progress Track)*. [\[pdf\]](#) *equal contribution
- Hong, J., Gu, J., **Lee, YK.**, Hahn, S. (2022). Fishing Free-Riders using Altruism: Zero-Sum Fitness Competition on Prey-Predator System. *Cognitive Science Society (CogSci) 2022*. [\[pdf\]](#)
- **Lee, YK.**, Jung, YW., Lee, I., Park, JE., & Hahn, S. (2021). Building a Psychological Ground Truth Dataset with Empathy and Theory-of-Mind During the COVID-19 Pandemic. *Cognitive Science Society (CogSci) 2021*.[\[pdf\]](#)
- **Lee, YK.**, Lee, I., Park, J. E., Jung, Y., Kim, J., & Hahn, S. (2021). A Computational Approach to Measure Empathy and Theory-of-Mind from Written Texts. *arXiv preprint arXiv:2108.11810*.[\[pdf\]](#)
- Jung, YW., **Lee, YK.**, & Hahn, S. (2021). Web-scraping the Expression of Loneliness during COVID-19. *Cognitive Science Society (CogSci) 2021*.[\[pdf\]](#)
- Park, JE., **Lee, YK.**, & Hahn, S. (2021). Racial Bias in Emotion Inference: An Experimental Study Using a Word Embedding Method. *Cognitive Science Society (CogSci) 2021*.[\[pdf\]](#)

- Lee, I., Lee, YK., & Hahn, S. (2021). Understanding Emotional Information from Images and Texts: A Cross-Cultural Study. *HCI International 2021 (HCII)*, Accepted.
- Kim K*, & Lee, YK*, Ahn, H., Hahn, S., & Song, O. (2020). Pedestrian Intention Prediction for Autonomous Driving Using a Multiple Stakeholder Perspective Model. *2020 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*.[\[pdf\]](#)
- Lee, YK., Rhee, YE., Ryu JK., & Hahn, S. (2020). Gentlemen on the Road: Understanding How Pedestrians Interpret Yielding Behavior of Autonomous Vehicles using Machine Learning, *arXiv preprint arXiv:2005.07872*.[\[pdf\]](#)
- Lee, YK., Bang, H., Rhee, YE., Kwon, M., Kwang, J., & Hahn, S. (2019). An Empirical Study of Pedestrian-Vehicle Interaction Using Virtual Reality. *Proceedings in HCI Korea 2019*. Jeju, Republic of Korea.[\[link\]](#) [\[pdf\]](#)
- Lee, YK (2018). *Effects of SNS on Social and Emotional Well-being of Older Adults in Korea*, M.A. Thesis, Seoul National University.[\[pdf\]](#)

Academic Services (Reviewer)

- **Journal:** *PRESENCE: Virtual and Augmented Reality*, *Korean Journal of Cognitive Science*
- **Int. Conference:** *Cognitive Science Society (CogSci)*

Talks

- “[Ver.2] Scaling up Psychology: From Cognitive Psychology to Human-AI Interaction II”, *Connectome Lab Invited Talk, SNU*, Seoul, Korea, Aug 2022 [\[slides\]](#)
- “Introduction to Mental Healthcare Chatbots: Designs and Challenges”, *Dongkuk University AI Center*, Korea, Jan 2022 [\[slide\]](#)
- “[Ver.1] Scaling up Psychology: From Cognitive Psychology to Human-AI Interaction I”, *Applied Cognitions (AppCog), Human Factors Psychology Laboratory, SNU*, Seoul, Korea, March 2021
- “Effects of SNS on Social Interactions and Depressive Symptoms of Older Adults in Korea”, *Annual Meeting of the Korean Cognitive Science Society 2019*, Seoul, Korea, April 2019
- “Empirical Study of Pedestrian-Vehicle Interaction”, *SNU Human-Computer Interaction Forum*, SNU, July 2018
- “Python for Psychologists: Introduction to PsychoPy”, *Psygrams, NAVER D2 Startup Factory*, Seoul, Korea, June 2018

Teaching & Advising

- **Graduate Supervisor,**
 - *SNU Brain, Mind, and Behavior Interdisciplinary Program*, 2022.
Jisang Park, Business & Computer Science Major, Thesis: “[From Bimodal to Multimodal: Augmented MELD for Emotion Recognition in Conversations](#)”

- *SNU Undergraduate Research Practicum Program*, 2022.
Jung Lee, Psychology Major, Thesis: “[*Mental Healthcare Chatbot Using Music Recommendation System for Emotion-based Conversations*](#)”
- **Python Instructor**, *Self-Paced Learning & Tutoring (SPLIT) Program*, Dept. of Engineering, SNU, 2019 [[materials](#)]
- **Teaching Assistant**, *Psychology and Artificial Intelligence*, Korean Mass Open Online Course (K-MOOC), 2019-2023 [[link](#)]
- **Instructor**, *Natural Language Processing (NLP) Workshop*, Dept. of Psychology, SNU, 2022
- **Instructor**, *Introduction to Text Mining with Python (Tutorial Session)*, IT Education for Faculty Members, Ajou University, Korea, March 2019 [[code](#)]
- **Teaching Assistant**, *Introduction to Psychology*, Dept. of Psychology, SNU, 2016-2018
- **Graduate Coordinator**, Brain, Mind, and Behavior Interdepartmental Program, Dept. of Psychology, SNU, 2017-2018
- **Manager**, SONA System (Research Participant Pool Management), Dept. of Psychology, SNU, 2017-2018

Datasets

- **Lee, YK.** (2023). Empathetic ToM Feedback Dataset. Version 1. [[github](#)]
- **Lee, YK et al.** (2022). OPELA: Open-domain conversations by Personas with Empathy, Long-term memory, and Attractive personality Dataset. SmilegateAI & Seoul National University. Version 1. [[github](#)]
- **Lee, YK et al.,** (2021). Covid19-Tom-Empathy-Diary Dataset. Version 1 [[github](#)]

Programming Workshops

- Prompt Engineering 101, Institute of Psychological Science, *SNU*, 2023. [[material](#)]
- Introduction to Chatbots: RASA Framework, *SNU*, 2021 [[code](#)]
- Introduction to Python, *SNU*, 2019 [[code](#)]
- Introduction to Deep Learning with Keras, *SNU*, 2019 [[code](#)]
- Introduction to NLP with Python, *SNU*, 2019 [[code](#)]
- Introduction to Reinforcement Learning, *SNU*, 2019 [[code](#)]
- Building Psychology Experiments with PsychoPy, *SNU*, 2018 [[code](#)]

Poster Presentations (non-archival)

- **Lee, YK, & Hahn, S.** (2019). Study of Pedestrian-Vehicle Interaction Using Virtual Reality. *The 57th Annual Meeting of the Psychonomic Society*. November 14-17, Montreal, Canada.

- **Lee, YK.**, Jyung M., & Hahn, S. (2018). Individual Differences in Emotion Regulation Strategy and Buying Decision after Stressful life-events, *Association for Psychological Science*, San Francisco, CA
- **Lee, YK.**, Kwon, M., Bang, H., & Hahn, S. (2018). Social and Emotional Effect of Smartphone Application Use in Korean Elderly Smartphone Users, *Korean Society for Cognitive and Biological Psychology*, Suwon, Republic of Korea.
- Bang, H., **Lee, YK.**, Lee, J., & Hahn, S. (2018). Effects of motivation on task performance and choice of task demand. *The 59th Annual Meeting of the Psychonomic Society*. November 15-18. New Orleans, LA.
- Hahn, S., Kwon, H., Ryu, J., **Lee, YK.**, Kwon, M., & Bang, H. (2018). Trust in Autonomous Vehicles: An empirical study with interdisciplinary perspectives. *Annual Conference of Korean Psychological Association*, March, Seoul, Republic of Korea.
- Hahn, S., Kim, TW., Kwon, DY., & **Lee, YK.** (2017). Aging and Technology Efficacy. *The 58th Annual Meeting of the Psychonomic Society*, Vancouver, Canada
- Kim TW., **Lee, YK.**, & Hahn, S. (2016). The Role of Perceptual Salience in Affective Conditioning. *Annual Meeting of the Psychonomic Society*, Boston, MA.

R&D Projects

[Ind]: Industry, [Gov]: Government, [Acc]: (Academic) Institution

- **Project Lead & Researcher**
 - [Acc] Development of Educational VR Program to Promote Empathy: Increasing Cooperation and Prosocial Behavior through Immersive VR Experience. *Seoul National University Faculty of Liberal Education*. 2022-2023
 - [Ind] Self-aware and Empathetic Conversational Agent based on Persona. *Smilegate.AI*, 2022
 - [Gov] AI Data Voucher, *Korean Data Agency, Ministry of Science and ICT Affiliation*, 2021
 - [Gov] AI-based Online Personal Psychological Monitoring & Management System. *Seoul Business Agency*, 2021
 - [Gov] Development of an AI-based Service Platform for Psychological Self-Test and Management. *Korean Ministry of SMEs and Startups*, 2019-2020
 - [Gov] Development of Immersive Tourism Technology Utilizing 4D Technology and Affective Modeling, *Korea Creative Content Agency*, 2018-2019
- **Researcher**
 - [Acc] Smart Aging Avatars: Research on Intelligent Biofeedback and Visualized Human-AI Interaction Technologies. *SNU Interdisciplinary Research Project*, 2022
 - [Gov/Acc] Center for Human-AI Interaction Project, *SNU AI Institute*, 2020. 9-12

- [Gov/Acc] Center for AI Ethical, Legal, Social Issues Project, *SNU AI Institute*, 2020. 6-12
- [Acc] Trust in autonomous vehicles: empirical studies with interdisciplinary perspectives. *Korean Psychological Association*, 2018
- [Acc] Assessment of Perceptual, Cognitive, Psychomotor Ability of Older Adults for Development of Interface Design. *Seoul National University Interdisciplinary Research Program*, 2016-2017

Awards & Grants

- **2023 Social Science Future Academic Researcher Grant**, Title: “A Portrait of Emotion: Empowering Self-Expression through AI-Generated Art”, *SNU*, 04/2023-1/2024
- **2021 Social Science Future Academic Researcher Grant**, *SNU*, Title: “*Personality and Emotion Prediction of Mental Health Conversational Agent using Pre-trained Deep Learning Model*”, *SNU*, 04/2021-1/2022
- **2020 Social Science Future Academic Researcher Grant**, *SNU*, Title: “*Theory of Mind and AI: Empathy Learning of AI Using Visual Question Answering and Big Data*”, *SNU*, 04/2020-1/2021
- **Teaching and Research Scholarship**, *SNU*, 2016-2022
- **Macromill-Embrain Best Research Award**, Korea Cognitive Science Society, 2019
- Dean’s List, University of Iowa, 2012-14.

Research Experiences

- Social Science/Humanities Research Professional, CASCog Lab (PI: Desmond Ong), Department of Psychology, *University of Texas at Austin*, USA. 2023-2024
- Doctoral Researcher, Human Factors Psychology Laboratory (PI: Sowon Hahn), Department of Psychology, *Seoul National University*, Korea, 2018-2022
- Undergraduate Researcher, Mechanisms of Audio-Visual Categorization Laboratory (PI: Bob McMurray), *University of Iowa*, USA. 2013-2015
 - Conducted an independent project speech categorization of Korean words by English native speakers
 - Ran multiple trials of eye-tracking experiments (EyeLink II and 1000 plus)
 - Analyzed LPC synthesis of phoneme stimuli using Praat
- Undergraduate Research Assistant, Child Decision Making Laboratory (PI: Irwin Levin & Elaine Bossard), *University of Iowa*, USA, 2013
 - Collected data for decision-making research (Iowa gambling tasks)

Skills

- Programming Languages | Python, R
- ML Framework | PyTorch, TensorFlow
- Chatbot Framework | Rasa, DialogFlow, ChatFuel

- Design | Photoshop, Illustrator
- Cloud Computing | Google Cloud Platform
- Data Analysis | R, SPSS, BigQuery
- Phonetic Analysis | Praat, Kaldi (ASR)
- Experiment Builder | PsychoPy, OpenCV
- Eye-tracking | Eyelink 2000+

References

- Sowon Hahn, Ph.D.
Professor, Department of Psychology, Seoul National University
- Jiook Cha, Ph.D.
Professor, Department of Psychology, Seoul National University
- Desmond Ong, Ph.D.
Professor, Department of Psychology, U of Texas at Austin
- Bob McMurray, Ph.D.
Professor, Department of Psychological and Brain Sciences, The U of Iowa