Ellen Da-eun Lee

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Research Interests

Affective Computing in Healthcare Applications

My research interests mainly revolve around Affective Computing with NLP and Multi-Modal Learning about developing accessible AI healthcare systems to address tangible real-world challenges.
For additional information, please visit my webpage: **[Research Highlights]**

Education

Sungkyunkwan University, Republic of Korea — Mar. 2020 - Aug. 2024
- Ph.D. in Applied Artificial Intelligence
- Advisor: Prof. Jinyoun Han
- Thesis: Predicting Suicidality with Explainable Deep Learning Models

Sookmyung Women's University, Republic of Korea — Mar. 2012 - Feb. 2017
- B.A. in Social Psychology

Professional Experience

Sungkyunkwan University, Republic of Korea — Sep. 2024 - Dec. 2024
- **Adjunct Professor** in Dept. Applied Artificial Intelligence

University of South Florida, Tampa, FL, USA — Oct. 2023 - Mar. 2024
- **Visiting Scholar** in Computer Science & Engineering
- Advisor: Prof. Seungbae Kim

RaonData, South Korea — Jul. 2022 - Oct. 2022
- **AI research Intern**
- Processing speech data to develop TTS models

Korea Psychological Autopsy Center, South Korea — Apr. 2018 - Aug. 2019
- **Data Scientist**
- 5-year time-series analysis of suicides in South Korea

Publications

(= (co-) corresponding author, ** = equal contribution)*

—Under Review & Work in Progress

[U-1] **Predicting Future Suicidality in Bipolar and Major Depressive Disorders on Social Media**
- Jeon, H.**, **Lee, D.****, Son, S., An, J., & Han, J.*
- ***Work in Progress*** - Aim to analyze the distinctive features of bipolar disorder and depression, to use these differences to create a predictive model for assessing future suicide risk associated with mental illnesses.

[U-2] **Gesture-aware Automatic Speech Recognition System for Individuals with Speech Disorder**
- **Lee, D.**, Jeon, H., You., D, Kim, S., & Han, J.*

- ***Work in Progress*** - Aim to analyze the voice replacement gesture characteristics of patients with speech disorders and develop an Automatic Speech Recognition System by incorporating gesture information.

[U-3] **An Effective Balancing Approach for Gender Bias Mitigatiion**
- Park, S., Kim, M., **Lee, D.**, Park, E., & Han, J.*
- ***Work in Progress*** - Aim to propose a data sampling approach to mitigate gender bias in state-of-the-art image captioning models.

— Conference

[C-1] **Multilingual Mild Cognitive Impairment Detection with Multimodal Approach**
- Barrera-Altuna, B., **Lee, D.**, Zarnaz, Z., Han, J., Kim, S.*
- **Interspeech 2024**

[C-2] **Detecting Bipolar Disorder from Misdiagnosed Major Depressive Disorder with Mood-Aware Multi-Task Learning**
- **Lee, D.****, Jeon, H**., Son, S., Park, C., An, J., Kim, S., & Han, J.*
- **NAACL 2024** - The North American Chapter of the ACL 2024
- [PDF] [DATASET & CODE] [VIDEO]

[C-3] **Fighting against Fake News on Newly-Emerging Crisis: A Case Study of COVID-19**
- Yang, M.**, Park, C.**, Kang, J., **Lee, D.**, Choi, D., & Han, J.*
- ***The Web 2024*** - The ACM Web Conference 2024 *(Short paper)*
- [PDF] [DATASET & CODE]

[C-4] **A Dual-Prompting for Interpretable Mental Health Language Models**
- Jeon, H.**, You, D.**, **Lee, D.**, Son, S., Kim, S., & Han, J.*
- **CLPsych 2024** - The 9th Workshop on Computational Linguistics & Clinical Psychology
- [PDF] [VIDEO]

[C-5] **Learning Co-Speech Gesture for Multimodal Aphasia Type Detection**
- **Lee, D.****, Son, S.**, Jeon, H., Kim, S., & Han, J.*
- **EMNLP 2023** - The 2023 Conference on Empirical Methods in Natural Language Processing
- [PDF] [CODE] [VIDEO]

[C-6] **Towards Suicide Prevention from Bipolar Disorder with Temporal Symptom-Aware Multitask Learning**
- **Lee, D.**, Son, S., Jeon, H., Kim, S., & Han, J.*
- **ACM KDD 2023** - The 29th ACM SIGKDD International Conference on Knowledge Discovery & Data Mining
- [PDF] [DATASET & CODE] [VIDEO]

[C-7] **Detecting Suicidality with a Contextual Graph Neural Network**
- **Lee, D.**, Kang, M., Kim, M., & Han, J.*
- **CLPsych 2022** - The 8th Workshop on Computational Linguistics & Clinical Psychology
- [PDF] [DATASET & CODE]

[C-8] **Cross-Lingual Suicidal-Oriented Word Embedding toward Suicide Prevention**
- **Lee, D.**, Park, S., Kang, J., Choi, D., & Han, J.*
- **EMNLP Findings 2020** - The 2022 Conference on Empirical Methods in Natural Language Processing Findings
- [PDF] [DATASET & CODE] [VIDEO]

— Journal

[J-1] **Detecting depression on video logs using audiovisual features**
- Min, K.**, Yoon, J.**, Kang, M., **Lee, D.**, Park, E., & Han, J.*
- **HSSComms 2023** - Humanities & Social Sciences Communications 2023, 10, 788 (SSCI, JCR 2022 IF = 3.5)
- [PDF]

[J-2] **Machine learning for mental health in social media: bibliometric study**
- Kim, J., **Lee, D.**, Park, E.*
- **JMIR 2021** - Journal of Medical Internet Research 2023, 23(3), e24870. ISSN: 1438-8871 (SCIE, JCR 2019 IF=5.034, Q1 in Medical Informatics)
- [PDF]

Domestic Patents

[P-1] **Appratus for Predicting Aphasia Type and Method Thereof**
- Inventor: Han, J.*, **Lee, D.**, Son, S., & Jeon, H.
- Application No.: 10-2024-0060023
- Filing Date: 2024-05-07

[P-2] **Appratus for Predicting Future Suicide Risk and Method Thereof**
- Inventor: Han, J.*, **Lee, D.**, Son, S., & Jeon, H.
- Application No.: 10-2024-0056538
- Filing Date: 2024-04-29

Research Projects

[R-1] **NRF International Mobility Program 2023**, $MIST^1$ and NRF^2
- Research Associate (*in Charge*) Oct. 2023 - Sep.2024
- Developing AI models for detecting Dementia using speech data
- Collaborating with University of South Florida (USF)
- Published 1 conference articles as a first author

[R-2] **A Clinical Decision Support System for Retinal Disease Detection with Explainable AI**, NRF^2
- Research Associate Mar. 2023 - Feb. 2027
- Analyzing image segmentation techniques on retinal disease detection

[R-3] **Developing Deep learning Models and Korean Datasets for Detecting Suicide Risk**, NRF^2
- Research Associate (*in Charge*) May. 2022 - Apr. 2024
- Constructed novel Korean social media datasets, and developed suicide risk detection models
- Published 2 conference articles as a first author

[R-4] **Developing Artificial Intelligence Application Models and Constructing Dataset for solving social issues**, $ETRI^3$
- Research Associate (*in Charge*) Jun. 2021 - Aug. 2021
- Analyzed and constructed mental health related Q&A dataset
- Implemented web application using Flask and uploaded project tutorial video
- Published 1 conference article as a first author

[R-5] **Developing a Model for Detecting Fake News on COVID-19**, $ETRI^3$
- Research Associate Jul. 2020 - Nov. 2020
- Analyzed a social network on YouTube and developed a COVID-19 fake news detection model
- Published 1 journal article as a third author

****Sponsor**

1 MIST: Ministry of Science and ICT, The government of the Republic of Korea
2 NRF : The National Research Foundation of South Korea
3 ETRI: Electronics and Telecommunications Research Institute, South Korea

Honors & Awards

Best Researcher Award Jan. 2024
- Dept. of Applied AI, Sungkyunkwan University

Scholarship for Korea-U.S. Research program ($1,300) Jul. 2023
- National Research Foundation of Korea (NRF) funded by the Ministry of Science & ICT
- Supported for being one of the 10 elite young female STEM researchers.

SIGKDD '23 Student Travel Award ($800) Aug. 2023
- The 29th ACM SIGKDD International Conference on Knowledge Discovery & Data Mining

Graduate Scholarship ($22,000; 1/2 Tuition) 2020 - 2023
- Sungkyunkwan University

Services

Reviewer
- ACL '24 / CLPsych '23 / PKDD '24 / EMNLP '24 / CIKM '24

Volunteer
- ACM KDD '23 / EMNLP '23

Teaching Fellow

Adjunct Professor

Sungkyunkwan University, Seoul, South Korea
- DAI5019: Graph Mining, Graduate Course Fall 2024

Teaching Assistant

Sungkyunkwan University, Seoul, South Korea
- DIM5004: Interactive Graph Mining, Graduate Course Spring 2024
- DAI5019: Graph Mining, Graduate Course Fall 2022
- AAI3005: Data Mining, Undergraduate Course Spring 2021
- AAI3006: Machine Learning, Undergraduate Course Spring 2021
- DAI5002: AI Programming, Graduate Course Fall 2020
- SWE2022: Intro to Programming, Undergraduate Course Fall 2020

Directed Students

Sungkyunkwan University, Seoul, South Korea
- Undergraduate Research Program, Tutor
  - Machine-Generated Text Detection Fall 2023
  - Mental Status Detection Summer 2021

University of South Florida, Tampa, USA
- Undergraduate Research Tutor
  - Speech-Based Cognitive Assessment in Chinese and English Spring 2024

Talks & Panels

Graph Neural Network-based Diagnosis Prediction Apr. 2024
- Dept. of Applied AI, SKKU

Learning Co-Speech Gesture for Multimodal Aphasia Type Detection Mar. 2024
- Global and National Security Institute (GNSI), USF

Detecting Suicidality in Social Media Using Deep Learning Oct. 2023
- Institute for Artificial Intelligence + X, USF

Graph Neural Network-based Diagnosis Prediction Oct. 2023
- Dept. of Applied AI, SKKU

Detecting Suicidality in Social Media Using Deep Learning Sep. 2023
- Dept. of Applied AI, SKKU

Towards Suicide Prevention from Bipolar Disorder with Temporal Symptom-Aware Multitask Learning *[Best Presenter Award]* Sep. 2023
- AI Colloquium 2023, SKKU

Artificial Intelligence & Mental Health Aug. 2023
- Invited Talk at Doonchon Highschool, South Korea

Cross-Lingual Suicidal-Oriented Word Embedding toward Suicide Prevention Nov. 2021
- AI Colloquium 2021, SKKU

References

Prof. Jinyoung Han (e-mail: jinyounghan@skku.edu)
- Associate Professor
- Department of Applied Artificial Intelligence, Sungkyunkwan University, Seoul, Republic of Korea

Prof. Seungbae Kim (e-mail: seungbae@usf.edu)
- Assistant Professor
- Computer Science and Engineering Department, University of South Florida, Tampa, FL, USA

Prof. Daejin Choi (e-mail: djchoi@inu.ac.kr)
- Assistant Professor
- Computer Science and Engineering Department, Incheon National University, Incheon, Republic of Korea