# YOONJOO LEE

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## RESEARCH INTEREST

My research interest lies in the intersection of human-computer interaction (HCI), natural language processing (NLP), and Education. I aim to support people to learn from and understand information-dense text (e.g., lecture transcript, scientific article) by structuring the information in the context to create conversational questions and answers to scaffold people's understanding.

## EDUCATION

**KAIST** — **Daejeon, Republic of Korea**
Ph.D. Candidate in Computer Science. Advisor: Juho Kim — Sep. 2020 – Present

**Ewha Womans University** — **Seoul, Republic of Korea**
M.S. in Statistics (Applicational Statistics). Advisor: Dongwan Shin — Mar. 2018 – Feb. 2020
B.S. Major in Mathematics Education, Minor in Statistics — Mar. 2014 – Feb. 2018
Graduated with Honors (*Magna Cum Laude*)

**University of California, Davis** — **Davis, CA, USA**
Exchange student in Mathematics — Sep. 2015 – Feb. 2016

## PUBLICATIONS

### Conference and Journal Papers

**[C6] CogQA: Answering Advanced Questions on Scientific Articles (TBD)**
**Yoonjoo Lee**[*], Kyungjae Lee[*], Sunghyun Park, Dasol Hwang, Jaehyeon Kim, Hong-in Lee, Moontae Lee
*Accepted in ICML 2023*

**[C5] DAPIE: Interactive Step-by-Step Explanatory Dialogues to Answer Children's Why and How Questions**
**Yoonjoo Lee**, Tae Soo Kim, Sundong Kim, Yohan Yun, Juho Kim
*CHI 2023: Proceedings of the 2023 CHI Conference on Human Factors in Computing Systems.*

**[C4] Promptiverse: Scalable Generation of Scaffolding Prompts Through Human-AI Hybrid Knowledge Graph Annotation**
**Yoonjoo Lee,** John Joon Young Chung, Tae Soo Kim, Jean Y. Song, Juho Kim
*CHI 2022: Proceedings of the 2022 CHI Conference on Human Factors in Computing Systems*

**[C3] Personalizing Ambience and Illusionary Presence: How People Use "Study with Me" Videos to Create Effective Studying Environments**
**Yoonjoo Lee,** John Joon Young Chung, Jean Y. Song, Minsuk Chang, Juho Kim
*CHI 2021: Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems.*

**[C2] A Machine Learning Approach that meets Axiomatic Properties in Probabilistic Analysis of LTE Spectral Efficiency**
**Yoonjoo Lee**, Yunbae Kim, Seungken Park
*ICTC, Oct. 2019*

**[C1] Probabilistic Analysis of Spectral Efficiency for LTE based on PDCCH Measurement Data**
**Yoonjoo Lee**, Yunbae Kim, Yeonkyu Park, Seungken Park
*IEEE Communications Letters, vol. 23, no. 9, Sep. 2019*

### Posters and Workshop Papers

**[P5] LMCanvas: Object-Oriented Interaction to Personalize Large Language Model-Powered Writing Environments**
Tae Soo Kim, Arghya Sarkar, **Yoonjoo Lee**, Minsuk Chang, and Juho Kim
*CHI 2023 Workshop on Generative AI and HCI*

**[P4] Interactive Children's Story Rewriting Through Parent-Children Interaction**
**Yoonjoo Lee**, Tae Soo Kim, Minsuk Chang, Juho Kim
*ACL 2022 Workshop on Intelligent and Interactive Writing Assistant*

**[P3] XDesign: Integrating Interface Design into Explainable AI Education**
Hyungyu Shin, Nabila Sindi, **Yoonjoo Lee**, Jaeryoung Ka, Jean Y. Song, Juho Kim
*SIGCSE TS 2022 Posters*

**[P2] A Study on the Distribution Analysis of LTE Resource Block Usage from TSME Measurement Data**
**Yoonjoo Lee**, Yunbae Kim, Seungken Park
*KICS, Jun. 2018*

**[P1] A Study on the Estimation of Probability Distribution of the Spectral Efficiency of LTE based on TSME Measurement Data**
Yunbae Kim, **Yoonjoo Lee**, Seungken Park
*KICS, Jun. 2018*

## RESEARCH EXPERIENCE

**Allen Institute for AI (AI2)** **Seattle, US**
*Research Scientist Intern, Semantic Scholar Team* (*Mentor:* Pao Siangliulue, Joseph Chee Chang, Jonathan Bragg) May 2023 –

**LG AI Research** **Seoul, Republic of Korea**
*Research Scientist Intern, Advanced Machine Learning Lab* (*Mentor:* Moontae Lee, Kyungjae Lee) Nov. 2022 – March. 2023
- Designed a schema for questions triggered from academic papers by adapting prior literature in education to a paper reading context.
- Collected various advanced questions based on the proposed schema from academic paper readers [C6].

**KIXLAB, KAIST** **Daejeon, Republic of Korea**
*Graduate Research Intern* (*Mentor:* Juho Kim, Jean Y. Song) Mar. 2020 – Aug. 2020
- Investigated user experiences with VR services by analyzing large-scale text data using various techniques like clustering, topic modeling, and sentiment analysis.

**Electronics and Telecommunications Research Institute (ETRI)** **Daejeon, Republic of Korea**
*Graduate Research Assistant, Data Sciences Group* (*Mentor:* Yunbae Kim, Seungken Park) Mar. 2018 – Dec. 2019
- Performed analysis of Spectral Efficiency for LTE with probabilistic modeling and Deep Neural Networks. [P1, C1, C2]
- Participated in research about predicting future Resource Block Usage by applying stochastic modeling and Recurrent Neural Networks. [P2]

*Undergraduate Research Intern, Data Sciences Group* Jan. 2018 – Feb. 2018
- Devised a module for pre-processing and summarizing mobile traffic data in Python.

## TEACHING

**Introduction to Social Computing** Fall 2020, Fall 2021
*KAIST CS473, Instructor: Juho Kim*

**Time Series Analysis** Spring 2019
*Ewha Womans University, Instructor: Dongwan Shin*

**Regression Analysis** Fall 2018
*Ewha Womans University, Instructor: Donghwan Lee*

## SERVICES

### Program Committee
- CHI LBW 2023

### Reviewer
- CHI 2023, 2022
- UIST 2022
- ACL 2023
- CSCW 2023
- C&C 2022
- IEEE Transactions on Learning Technologies

### Student Volunteer
*CHI 2022*

**KAIST-Google ExploreCSR** 2022
*Student Organizer*

**Programming Mentoring** 2016 – 2017
*Leader of Student Organizer*

**Mathematics Mentoring in Ewha Girls High School** 2015 – 2017
*Mentor*

## HONORS, AWARDS, AND SCHOLARSHIPS

**Research Assistant Scholarship** 2019
*College of Natural Sciences, Ewha Womans University*

**Admission Scholarship** 2018
*College of Natural Sciences, Ewha Womans University*

**Honors Scholarship** 2014, 2015, 2016, 2017
*College of Education, Ewha Womans University*

**Dean's List** 2014, 2015, 2016, 2017
*College of Education, Ewha Womans University*

**Ewha Womans University Alumnae Association Scholarship** 2017
*College of Education, Ewha Womans University*

**Electronics and Telecommunications Research Institute (ETRI)** **Daejeon, Republic of Korea**
*Research Assistant, Data Sciences Group* Feb. 2018 – May 2019
- Created applicable transformation making results follow approximately jointly normal distribution with measurement data
- Derived the key probabilities for SE analysis and adopted Deep Neural Network(DNN) to extend the analysis from measured cases to general cases.

**Time Series Analysis Research Lab, Ewha Womans University** **Seoul, Republic of Korea**
*Time Series Research Lab (Advisor: Professor Dongwan Shin)* Jan. 2019 – Dec. 2019
- Built prediction models for high frequency data

**Probabilistic Analysis** **Daejeon, Republic of Korea**
*ETRI* Feb. 2018 – May 2019
- Created applicable transformation making results follow approximately jointly normal distribution with measurement data
- Derived the key probabilities for SE analysis and adopted Deep Neural Network(DNN) to extend the analysis from measured cases to general cases.

**Deep Learning** **Daejeon, Republic of Korea**
*ETRI* Feb. 2018 - Dec.2018
- Participated in research on busy hour RB usage rates data
  - Stochastic modeling: Derived a method to estimate probability density of the data by the family of Exponentiated Exponential Distribution using quantiles
  - Deep Learning: Predicted future RBU using Long Short-Term Memory(LSTM), Gated Recurrent Unit(GRU), Encoder-Decoder versions models

**Time Series Analysis** **Seoul, Republic of Korea**
*Time Series Research Lab (Advisor: Professor Dongwan Shin)* Jan. 2019 – Dec. 2019
- Built prediction models for high frequency data
  - Deep Learning: Used DNN, LSTM for Realized Volatility(RV) classification and regression
  - Time Series model: Used Autoregressive Integrated Moving Average(ARIMA) and Heterogeneous Autoregressive(HAR) model to forecast RV and compared with Deep Learning model based on prediction error
- Applied dimension reduction methods to simplify original data structure with 40 financial features and forecast future RV

**KAIST-Google ExploreCSR** Spring 2022 – Present
*Student Organizer*

**Programming Mentoring** Mar. 2016 – Dec. 2017
*Leader of Student Organizer*
- Planned and led lectures about Python and Ruby on Rails for college students, prepared learning materials including lecture slides and coding assignments
- Organized a Hackathon event for 100+ students to promote cooperation with students from other schools

**Mathematics Mentoring in Ewha Girl's High School**, Seoul, South Korea Feb. 2015 – Dec. 2017
- Taught math to high school students every week with follow-up Q&A sessions

## ACADEMIC SERVICES

### Reviewer

CHI 2022
C&C 2022
IEEE Transactions on Learning Technologies

### Student Volunteer

CHI 2022

## SERVICE AND LEADERSHIP

**KAIST-Google ExploreCSR** Spring 2022 – Present
*Student Organizer*

**Programming Mentoring** Mar. 2016 – Dec. 2017
*Leader of Student Organizer*

**Mathematics Mentoring in Ewha Girl's High School** Feb. 2015 – Dec. 2017
*Mentor*

My research interest is supporting people to perform tasks ranging from teaching, writing, to prototyping effectively by 1) building AI powered systems with humans in the loop and 2) analyzing and adapting large scale data and models. Specifically, one of my research goals is to create computational methods and systems that support scalable teaching and learning using human-AI collaboration.