Jihwan Lee
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PERSONAL PROFILE

PhD student at **Signal Analysis and Interpretation Lab (SAIL), University of Southern Calfiornia**, advised by **Shrikanth Narayanan**. My research interests are: speech synthesis, computational linguistics, brain-computer-interfaces (BCIs), speech/language decoding from neural signals, etc. Prior to that, I worked at Language and Voice Team, Samsung Research, focusing on making text-to-speech models more personalized, multi-lingual, multi-style, controllable, on-device-friendly, and secure. I graduated Summa Cum Laude from **Seoul National University** with a B.S. in Electrical and Computer Engineering and a B.A. in Linguistics.

EDUCATION

University of Southern California
PhD Student (advisor: Shrikanth Narayanan)

Signal Analysis and Interpretation Laboratory (SAIL), Electrical and Computer Engineering

Los Angeles, California

Aug. 2023 - Present

Seoul National University
College of Liberal Studies (GPA: 3.9/4.3; summa cum laude)

Bachleor of Science in Electrical and Computer Engineering
Thesis: Non-Stop Intersection Simulator (supv. Hyungbo Shim)

Bachleor of Arts in Linguistics
Thesis: AI Language Acquisition - Pattern Generalization or Rote Memorization (supv. Sunwoo Jeong)

Seoul, South Korea

Feb. 2021

RESEARCH EXPERIENCE

Vision and Learning Lab, Seoul National University (supv. Gunhee Kim)
Research Assistant Intern

Seoul, South Korea
Jun. 2020 - Dec. 2020

- **Text Generation**: Worked on the decoder part of GPT-series. Attempted to mitigate the repetition problem in text generation by developing a new decoding method.

Computational Linguistics Lab, Seoul National University (supv. Hyopil Shin)
Research Assistant Intern

Seoul, South Korea
Feb. 2020 - Jun. 2020

- **AI-based Legal RPA Solution**: Participated in a project that automatizes legal document processing such as patents.

- **Pre-trained Language Models**: Tested the performance of KR-BERT, a pre-trained BERT model released by the lab, comparing with other pre-trained models using various downstream tasks.

WORK EXPERIENCE

Language and Voice Team, Samsung Research (supv. Chanwoo Kim)
Researcher/Engineer

Seoul, South Korea
Jan. 2021 - Aug. 2023

- **Text-to-Speech**: Working on making text-to-speech systems to be multi-lingual, multi-style, controllable, and secure. Developing personalized text-to-speech systems with only limited recordings of the target speaker via few- or zero-shot scheme.

- **Digital Human/Robot**: Deployed text-to-speech service for digital humans and robots via MQTT framework, connected along with other modules including voice/lip activity detection, speech recognition, machine translation, natural language generation, etc. Demos performed at internal OpenLab event and 2022 CES.

- **1st Place at Samsung Research Business Idea Contest**: Won the first place at Samsung Research Business Idea Contest, proposing Auto-Dub: an automatic system dubbing any videos in different languages while maintaining the original speaker's voice identity, embedded in Galaxy smartphone's default Gallery App.

Security Lab, Samsung Research (supv. Taeho Kgil)
Software Engineer Intern

Seoul, South Korea
Jul. 2019 - Aug. 2019

- **Security**: Participated in a project that detects malicious WiFi access points, assisting automatization of attacking and detecting processes.

- **Qraft Technologies**   Seoul, South Korea
  Software Engineer Intern   *Dec. 2018 - Apr. 2019*
  - **Finance**: Developed an AI-based forex prediction model, that predicts currency exchange rate in the near future. Applied deep learning architectures, originally developed for vision, to finance field.

PUBLICATIONS

[v] **Jihwan Lee**, Aditya Kommineni, Tiantian Feng, Kleanthis Avramidis, Xuan Shi, Sudarsana Kadiri, and Shrikanth Narayanan, 'Toward fully-end-to-end listened speech decoding from EEG signals", *in Proc. Interspeech 2024*

[v] Heejin Choi, Jae-Sung Bae, Joun Yeop Lee, Seongkyu Mun, **Jihwan Lee**, Hoon-Young Cho, and Chanwoo Kim, "MELS-TTS: Multi-Emotion Multi-lingual Multi-Speaker Text-to-Speech System via Disentangled Style Tokens", *in Proc. ICASSP 2024*

[v] Joun Yeop Lee, Jae-Sung Bae, Seongkyu Mun, **Jihwan Lee**, Ji-Hyun Lee, Hoon-Young Cho, and Chanwoo Kim, "Hierarchical Timbre-Cadence Speaker Encoder for Zero-shot Speech Synthesis", *in Proc. Interspeech 2023*

[v] **Jihwan Lee**, Joun Yeop Lee, Heejin Choi, Seongkyu Mun, Sangjun Park, Jae-Sung Bae, and Chanwoo Kim, "Into-TTS: Intonation Template Based Prosody Control System", *arXiv preprint arXiv:2204.01271*

[v] **Jihwan Lee**, Jae-Sung Bae, Seongkyu Mun, Heejin Choi, Joun Yeop Lee, Hoon-Young Cho, and Chanwoo Kim, "An Empirical Study on L2 Accents of Cross-lingual Text-to-Speech Systems via Vowel Space", *arXiv preprint arXiv:2211.03078*

[v] Seongkyu Mun, Dhananjaya Gowda, **Jihwan Lee**, Changwoo Han, Dokyun Lee, and Chanwoo Kim, "Prototypical Speaker-interference Loss for Target Voice Separation Using Non-parallel Audio Samples", *in Proc. Interspeech 2022*

PATENTS

- **Electronic Device and Controlling Method of Electronic Device**
  (Intonation Template Based Prosody Control System)
  Jihwan Lee, Joun Yeop Lee, Heejin Choi, Seongkyu Mun
  US/KR Patent (US in progress; KR #P2022-0171848)

SKILLS AND LANGUAGES

- **Skills**: Python, C++, Tensorflow, Pytorch, Keras, MATLAB, Linux, MQTT, etc
- **Languages**: Korean(Native), English(Advanced), German(Intermediate), Chinese(Beginner), Spanish(Beginner)

AWARDS, HONORS, AND SCHOLARSHIP

- Annenberg Fellowship   *Aug. 2023 - Jul. 2024*
- 1st Place at Samsung Research Business Idea Contest   *Dec. 2021*
- *summa cum laude* (Seoul National University)   *Feb. 2021*
- Samsung Scholarship (approx. $5,000 / semester)   *Summer 2019 - Summer 2020*

ADDITIONAL INFORMATION

- Samsung Data Science Certificate   *November 2022*
- Samsung Software Professional Certificate   *May 2021*
- SNU in Silicon Valley   *Summer 2018*
- Exchange Student @ Universität Bonn   *Sep 2017 - Feb 2018*
- Visiting Student @ Peking University   *Summer 2017*
- Military Sevice   *Jul 2015 - Jul 2017*
- Visiting Student @ Freie Universität Berlin   *Summer 2014*
- Private Tutoring (Mathematics/Science)   *2014 - 2015*

SOME RANDOM FACTS ABOUT ME

- I love learning new languages. When I travel overseas, I always try to learn some of basic phrases in the language spoken there.
- I enjoy water sports. I recently obtained a free diving license. I also love surfing and sailing.
- I have the third degree Taekwondo black belt, also qualified as a Sr. instructor.