Sanghoon Kim

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Skills & Interests

Natural Language Processing

- Experience in building task-oriented conversational agents through Dialogflow, analyzing user experience through user studies, and publishing the research outcome as a paper.
- Research experience in designing user-friendly conversational interfaces by utilizing knowledge in the field of linguistics.
- Interested in research questions and practical challenges for building usable conversational systems.

Web Software Engineering

- 2 years of front-end engineering experience using React and state management libraries.
- Experience in handling and rendering gigabyte-scale images on web browsers.
- Experience in building back-end services for managing dialog history of a conversational agent and serving machine learning models using Python frameworks.

Work Experience

Web Front-end Engineer, Lunit Inc. *Aug. 2021 - Present*

- Working as a TRP (Technical Research Personnel) for fulfilling military service.
- Developing an annotation tool and a back office console for pathologists to better-annotate cancer cells and tissues from large-scale slide images, thus improving cancer prediction quality of artificial intelligence models.
- Technology used: React, Next.js, Redux, Redux-saga, Recoil

2021 Work Highlights

- Improved the rendering performance of the annotation tool up to 4.2x faster with optimizing Redux action dispatches and custom hooks.
- Migrated the default bundler of the annotation tool from create-react-app to Vite, resulting in up to 2x faster production bundling performance.

2022 Work Highlights

- Improved the manageability and reliability of the back office console by updating legacy dependencies, such as Material UI v4 to v5, applying ESLint rules, and resolving 250+ errors and warnings from the rules.
- Integrate Sentry and Elastic APM for tracking issues and exceptions on the annotation tool and the console.
- Wrote and significantly improved tens of documentation and references for the applications, ranging from project management to module references, postmortems, technical reports, and onboarding documents.

Education

Google Machine Learning Bootcamp 2022 *Jun. 2022 - Oct. 2022*

Learned development techniques in the field of deep learning utilizing TensorFlow and PyTorch.
Earned the following credentials with the support of the Google Developers Group:

- TensorFlow Developer Certificate (expires Aug. 2025)
- Deep Learning Specialization
- Natural Language Processing Specialization
- Machine Learning Engineering for Production

Korea Advanced Institute of Science and Technology (KAIST) *Sep. 2019 - Aug. 2021*

M.Sc. in Computer Science (Advisor: Prof. In-Young Ko) Overall GPA: 4.05 / 4.3
Thesis: A Conversational Service Mashup Model to Support End-User Service Mashup in IoT Environments
Keywords: Internet of Things, IoT Automation, Conversational Agent, Chatbot
Scholarship supported by Korean government with monthly stipend of at least KRW 800,000 (about $800).

Ulsan National Institute of Science and Technology (UNIST) *Mar. 2015 - Aug. 2019*

B.Sc. *magna cum laude* in Electrical and Computer Engineering
Majored in Computer Science and Engineering Overall GPA: 3.78 / 4.3
Minored in Management Engineering Major GPA: 3.99 / 4.3

Publications

International Conferences

[3] C. Lee, S. Park, H. Song, J. U. Ryu, S. Kim, H. Kim, S. Pereira, and D. Yoo, "Interactive Multi-Class Tiny-Object Detection," In *2022 IEEE/CVF Conference on Computer Vision and Pattern Recognition* (**CVPR 2022**)

[2] S. Kim and I.-Y. Ko, "A Conversational Approach for Modifying Service Mashups in IoT Environments," In *Proceedings of the 2022 CHI Conference on Human Factors in Computing Systems* (**CHI '22**)

[1] C. Lee, S. Kim, D. Han, H. Yang, Y. Park, B. C. Kwon, and S. Ko, "GUIComp: Design and Evaluation of Mobile GUI Design Assistant with Real-Time, Multi-Faceted Feedback," In *Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems* (**CHI '20**)

Domestic Conferences

[3] K.D. Baek, S. Kim, and I.-Y. Ko, "Development of Platform-independent IoT Service Framework for Solving Heterogeneity Problem (이종성 문제 해결을 위한 플랫폼 독립적인 IoT 서비스 프레임워크)," In *Proceedings of 2020 Korea Software Congress* (KSC2020)

[2] S. Kim and I.-Y. Ko, "Conversational Services Composition Model to Support End-User Services Composition in IoT Environments (IoT 환경에서 최종 사용자 서비스 조합을 지원하기 위한 대화형 서비스 조합 모델)," In *Proceedings of 2020 Korea Computer Congress* (KCC2020) **[Best Paper Award]**

[1] S. Kim and I.-Y. Ko, "Precondition and Goal State Assertion for Improving the Reliability of Trigger-Action Based Service Mashup (트리거-액션 기반 서비스 매쉬업의 신뢰도를 개선하기 위한 전제 상태 및 목표 상태 검증 방법)," In *Proceedings of the 22nd Korea Conference on Software Engineering* (KCSE '20), Short Paper

Domestic Journals

[1] S. Kim and I.-Y. Ko, “A User-Centric Conversational Service Mashup Model and Engine (사용자 중심의 대화형 IoT 서비스 매쉬업 모델과 엔진),” In *Journal of KIISE* (JOK), 48(5), pp. 584-594, May 2021.

Posters

[2] K. Kim, S. Kim, C. Lee, and S. Ko, “Poster: Modeling Exploration/Exploitation Decisions through Mobile Sensing for Understanding Mechanisms of Addiction,” In *Proceedings of the 17th Annual International Conference on Mobile Systems, Applications, and Services* (MobiSys ’19)

[1] Y. Han, C. Lee, S. Kim, and S. Ko, “Poster: System Architecture for Progressive Augmented Reality,” In *Proceedings of the 17th Annual International Conference on Mobile Systems, Applications, and Services* (MobiSys ’19)

Patents

[2] An Implicature-Based Interaction Model to Modify Automation Rules in IoT Environments. Korea Patent No. 10-2429334, Aug. 01, 2022 (고인영, 김상훈. IoT 환경에서 자동화 규칙을 수정하기 위한 함축 기반 상호작용 모델. 등록번호 10-2429334).

[1] Conversational Services Composition Model to Support End-User Services Composition in IoT Environments. Korea Patent No. 10-2395122, May 02, 2022 (고인영, 김상훈. IoT 환경에서 최종 사용자 서비스 조합을 지원하기 위한 대화형 서비스 조합 모델. 등록번호 10-2395122).

Research Experience

Paper Reviewer

ACM CHI 2023, Late-Breaking Work (LBW) Track
PACM IMWUT (UbiComp), 2021

Internship at iVADER Lab., UNIST — *Jan. 2018 - May 2019*

Research Intern (Advisor: Prof. Sungahn Ko)
Participated in a project which aims to formulate problems during mobile application prototyping and build solutions for helping users to design mobile applications.

Internship at NECSST Lab., UNIST — *Sep. 2016 – Aug. 2017*

Research Intern (Advisor: Prof. Sam H. Noh)
Studied briefly about Linux kernel, distributed computer & storage systems, and flash memory & FTL (Flash Translation Layer).

Open Source Software Contributions

OpenSeadragon (★2.7k, https://github.com/openseadragon/openseadragon**)**

- Fix #2065 and add setMaxLevel for #2059 (#2066)
- Fix getLevelScale to use image dimensions (#2059)

Lunit Frontend Components (★22, https://github.com/lunit-io/frontend-components**)**

- Fix a bug where changing the url of a tiledImage caused a crash (#151)
- Added support for custom tileSource (#148)
- Fix min / max zoom level is not applied (#147)

Other Experience

Invited Talk, Dept. of Computer Science and Engineering, UNIST *Mar. 31st, 2023*

Presented a career talk titled "Between Research and Development: Web Frontend Development by Technical Research Personnel."

Teaching Assistant, School of Computing, KAIST

2019 Fall – Introduction to Services Computing (CS459) **[Best TA Award]**
2020 Spring – Data Structure (CS206) **[Best TA Award]**
2020 Fall – Introduction to Services Computing (CS459)

International Exchange Student to HKUST, Hong Kong *Jun. 2018 - Aug. 2018*

Domestic Exchange Student to SNU, Republic of Korea *Jun. 2016 - Aug. 2016*
Dec. 2016 - Feb. 2017

Awards

Gary Marsden Travel Awards (GMTA) 2022 *Mar. 2022*

Awarded $2,655 of travel grant by the ACM SIGCHI (Association for Computing Machinery) for the CHI '22 attendance.

Academic Performance Scholarship, UNIST *Mar. 2015 - Aug. 2019*

Full-tuition scholarship with monthly stipend of KRW 160,000 (about $160).

Dean's List, UNIST *Spring 2017*
Spring 2018
Fall 2018

2017 Spring semester (GPA: 3.92 / 4.3)
2018 Spring semester (GPA: 4.10 / 4.3)
2018 Fall semester (GPA: 4.05 / 4.3)

Excellence Award (3rd) in UNIST×NAVER D2SF×LikeLion Hackathon *Nov. 2018*

Awarded by LikeLion foundation with KRW 1,000,000 (about $1,000) in prize.

Excellence Award (6th) in 2017 Korea Supercomputing Challenge *Oct. 2017*

Awarded by the president of KSCSE (Korean Society for Computational Science and Engineering) with KRW 500,000 (about $500) in prize.