Seohyun Back

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Research Interest

- **NLP, NLU**: Natural language processing, Natural language understanding
- **MRC**: Deep learning for reading comprehension-based question answering
- **VQA**: Deep learning for visual question answering
- **Text Summarization**: Deep learning for text summarization

Programming Skills

- **Advanced**: Python (tensorflow, pytorch), C, C++, Java **Moderate**: HTML, CSS, Javascript

Education

- **Korea Advanced Institute of Science and Technology (KAIST)** Daejeon, South Korea
  Ph.D. Student in Artificial Intelligence (Advisor : Prof. Jaegul Choo) *Sep 2020 - Present*
- **Korea University (KU)** Seoul, South Korea
  M.E. in Big Data Convergence (Advisor : Prof. Jaegul Choo) *Sep 2016 - Feb 2019*
- **SungKyunKwan University (SKKU)** **[military service 2008 - 2009]** Suwon, South Korea
  B.S. in Computer Science and Engineering (Advisor : Prof. Jeehyong Lee) *Mar 2007 - Aug 2014*

International Publications

NeurQuRI: Neural Question Requirement Inspector for Answerability Prediction in MRC
- ***Seohyun Back**, Sai Chetan Chinthakindi, Akhil Kedia, Haejun Lee and Jaegul Choo*
  International Conference on Learning Representations (ICLR), 2020, Addis Ababa, Ethiopia

MemoReader: Large-Scale Reading Comprehension through Neural Memory Controller
- ***Seohyun Back**, Seunghak Yu, Sathish Indurthi, Jihie Kim and Jaegul Choo*
  Conference on Empirical Methods in Natural Language Processing (EMNLP), 2018, Brussels, Belgium, Long paper

Cut to the Chase: A Context Zoom-in Network for Reading Comprehension
- *Sathish Indurthi, Seunghak Yu, **Seohyun Back** and Heriberto Cuayahuitl*
  Conference on Empirical Methods in Natural Language Processing (EMNLP), 2018, Brussels, Belgium, Short paper

A Multi-Stage Memory Augmented Neural Network for Machine Reading Comprehension
- *Seunghak Yu, Sathish Indurthi, **Seohyun Back** and Haejun Lee*
  Proceeding of the Workshop on MRQA (co-located with ACL), 2018, Melbourne, Australia, Workshop Long paper

Domestic Publications

Text Summarization using Self-Attention and Self-Learning
- *Jisang Yu, **Seohyun Back** and Jaegul Choo*
  Conference on Korea Software Congress (KSC2018), 2018

WAS Framework Designed for Distributed Computing Environments
- *Ungueop Choi, Eunji Kwon, Jeongsub Lee and **Seohyun Back***
  Proceedings of The Korea Contents Association (KoCon) Spring Conference, 2013

Document Summarization Using Mutual Recommendation with LSA and Sense Analysis
- ***Seohyun Back**, Dongwook Lee, Minji Park, Jinhee Park, Hyewuk Jung and Jeehyong Lee*
  Proceedings of Korean Institute of Intelligent Systems (KIIS) Spring Conference, 2012, Best Paper Award

Moving Pattern based Bot Detection Model
- ***Seohyun Back**, Jaekwang Kim and Jeehyong Lee*
  Proceedings of Korean Institute of Intelligent Systems (KIIS) Fall Conference, 2011

Patents

Device, Method, and Program for Enhancing Content Through Iterative Generation (2019)

- ***Seohyun Back**, Jiyeon Hong, Sai Chetan, Cheolseung Jung, Haejun Lee, Yonghyun Ryu and Wonho Ryu*
  US (2019), WO (2019), KR P20190160008

Electronic Device and Method for Providing a Feedback Information for a User Input (2018)

- ***Seohyun Back**, Seunghak Yu, Huiwon Yun and Hojin Jung*
  US US16/718672, EP 20150327.3, KR P20190008608

Voice Recognition Apparatus and Operation Method Thereof (2017)

- ***Seohyun Back**, Doohwa Hong, Jongyoub Ryu, Jiyeon Hong, Sungja Choi and Eunkyoung Kim*
  US US16/211973, WO PCT/KR2018/015428, KR P20170167775

Electronic Device and Method for Controlling External Device Thereof (2016)

- *Jiwoong Choi, **Seohyun Back**, Yongseok Jang and Hyunah Oh*
  US US15/467054, CN 201780012476.9, WO PCT/KR2017/003103, KR P20160106116, EP 17786086.3

Research Experience

- **Samsung Research, AI Center (AI Core Lab)** — Seoul, South Korea
  Research Engineer — *Sep 2016 - Present*
  - **Question Generation**: Proposed and developed a pre-training method for question generation. Achieved state-of-the-art results in KorQuAD (Korean QA dataset in SQuAD style) using generated synthetic QA data.
  - **Multi-hop MRC**: Proposed and developed a new deep neural network for Multi-hop MRC tasks. Achieved multiple state-of-the-art results in HotpotQA leaderboards. (both in distractor and fullwiki setting)
  - **Machine reading comprehension (Question Answering)**: Proposed and developed a new deep neural network for QA tasks using external memory. Achieved multiple state-of-the-art results in popular QA competition leaderboards; MS MARCO (1st), TriviaQA (1st) and SQuAD (5th, single model). Also achieved state-of-the-art result on QUASAR and NarrativeQA datasets. (Supervisor : Dr. Seunghak Yu)
  - **Text summarization**: Reproduced several existing abstractive summarization models for research baselines.
  - **Voice assistant (Bixby)**: Developed a rejection module to exclude non-processable commands.
- **Samsung Creative Lab (C-lab)** — Seoul, South Korea
  Research Engineer — *Sep 2015 - Aug 2016*
  - **Indoor pointing system**: Customized GMM algorithm to predict indoor pointing using mobile device based on collected RF signal. The final project was acquired by Samsung Electronics Mobile Division.
  - **Machine learning library**: Developed own machine learning library for the python; Pytrain.
- **Information and Intelligence System Lab (IIS Lab)** — Suwon, South Korea
  Research Intern in SungKyunKwan University — *Jul 2011 - Jun 2012*
  - **Text summarization**: Proposed and developed a new extractive model. Best paper award in KIIS 2012.
  - **Auto playing bot detection**: Proposed and developed a method to detect auto playing bot in MMORPG.

Work Experience

- **Samsung DMC Research Institute (Acoustic and Sound Technology Lab)** — Suwon, South Korea
  Software Engineer — *Jul 2014 - Aug 2015*
  - **Commercial chatbot**: Developed chitchat model, crawler, dialog manager and customized intent classifier.
  - **Machine translation**: Integrated ASR, MT, TTS modules to make end-to-end system and built PoC.
  - **Dialog summarization**: Integrated ASR, dialog manager modules to make phone call summarization.
- **Samsung Software Membership** — Suwon, South Korea
  Software Engineer — *Jan 2011 - Jun 2014*
  - **Large-scale quiz system**: Developed distributed quiz server systems with multiple connections.
  - **Web market framework**: Developed p2p market solution that consist of web server and Android application.
  - **Distributed streaming system**: Developed web browser p2p streaming system using web-rtc protocol.
- **Whoyster** — Anyang, South Korea
  Software Engineer, Co-Founder, CEO — *Jul 2011 - Jun 2012*
  - **Document summarization solution**: Developed a tool for document analysis and extractive summarization.
  - **Funding**: Equipments and location was funded by National IT Industry Promotion Agency (NIPA).

Teaching Experience

- **Tashkent University of Information Technologies (TUIT)** Tashkent, Uzbekistan
  Software Engineering Tutor, Volunteer *Jul 2013 - Aug 2013*
  - **Machine learning**: Teaching basics of machine learning models including KNN, D-Tree, NaiveBayes. (50 hours)
  - **Java & Android**: Teaching fundamentals of Java language and Android application. (40 hours)

Honors and Awards

- **Samsung Best Paper Award 2019 Bronze* Prize**: AI division, accept rate 4.37% (Fall 2019)
- **Samsung Best Paper Award 2018 Gold* Prize**: AI division, 1st prize (Fall 2018)
- **Samsung Best Paper Award 2018 Silver* Prize**: AI division, accept rate 2.02% (Fall 2018)
- **Samsung Best Paper Award 2018 Bronze* Prize**: AI division, accept rate 4.17% (Fall 2018)
- **SEC Annual Awards Bronze* Prize**: Best achievement award in R&D, Samsung Electronics (Fall 2017)
- **Super Rookie 1st* Prize**: Highest performer of new employee's project, Samsung Electronics (Spring 2015)
- **Elite Membership Student**: Selected one of the best members, Samsung Software Membership (Spring 2014)
- **SSM Best Project Award 1st* Prize**: Best achievement award, Samsung Software Membership (Spring 2013)
- **KIIS Best Paper Award**: Korean Institute of Intelligent Systems 2012 (Spring 2012)
- **Smart Home Idea Award Triple 2nd* Prize**: Korea Association of Smart Home (Fall 2010)
- **SKKU Mobile App Competition Silver* Prize**: Sungkyunkwan University (Fall 2010)

Scholarships

- **Academic Scholarship**: Korea University (Spring 2018)
- **Digital Contest Scholarship**: Selected student, Sungkyunkwan University (Fall 2010)
- **Jang Yeong-sil Scholarship**: Freshmen for outstanding academic records, Sungkyunkwan University (Spring 2007)

Extracurricular Activities

- **Study and Open-source Coding Club (SOCC)** Seoul, South Korea
  Organizer *Dec 2013 - Feb 2020*
  - **Conducting AI studies**: Paper reading, Tensorflow programming, NLP/NLU, Statistical analysis.
  - **Organizing conference**: Planning and conducting IT conference every year with almost a hundred participants.
  - **Funding**: Conference cost and location was funded by NAVER LABS (Jun 2014 - Dec 2015).
- **The 3rd Software Maestro (Government-led training program)** Seoul, South Korea
  Student in software engineering *Jul 2012 - Nov 2012*
  - **Software mentoring course**: Studied agile methods and information retrieval.

Languages

- **English**: Business **Korean**: Native