

# Seohyun Back

Research Engineer, Samsung Research  
M.S. candidate, Korea University

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## RESEARCH INTEREST

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- **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

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

## EDUCATION

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- **Korea University** Seoul, South Korea  
*M.S. candidate in Big Data Convergence (Advisor : Prof. Jaegul Choo)* Sep 2016 - Present
- **Sungkyunkwan University (military service 2008 - 2009)** Suwon, South Korea  
*B.S. in Computer Science and Engineering (Advisor : Prof. Jeehyong Lee)* Mar 2007 - Aug 2014

## PUBLICATIONS

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- **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*  
*Proceedings of the Workshop on MRQA, Melbourne, Australia, 2018. Association for Computational Linguistics (ACL)*
- **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

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- **Answer Appropriateness Judgement in Question Answering System (2017)**  
*Seohyun Back, Doohwa Hong, Jongyoub Ryu, Jiyeon Hong, Sungja Choi and Eunkyoun Kim*  
*US (2018), WO (2018), KR P20170167775*
- **Electronic Device and Method for Controlling External Device Thereof (2016)**  
*Seohyun Back, Jiwoong Choi, Yongseok Jang and Hyunah Oh*  
*US US15/467054, CN (2018), WO PCT/KR2017/003103, KR P20160106116, EP 17786086.3*

## RESEARCH EXPERIENCE

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- **Samsung Research AI Center (Language Understanding Lab)** Seoul, South Korea  
*Research Engineer (Supervisor : Dr. Seunghak Yu)* *Sep 2016 - Present*
  - **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. Three papers accepted in ACL MRQA and EMNLP in 2018.
  - **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

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- **Samsung DMC Research (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* *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

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

## HONORS AND AWARDS

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- **Samsung Best Paper Award Gold\* Prize:** Among 1,580 submissions, AI division, 1st prize (Fall 2018)
- **Samsung Best Paper Award Silver\* Prize:** Among 1,580 submissions, AI division, accept rate 2.02% (Fall 2018)
- **Samsung Best Paper Award Bronze\* Prize:** Among 1,580 submissions, 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 (Fall 2013)
- **KIIS Best Paper Award:** Korean Institute of Intelligent Systems 2012 (Spring 2012)
- **Smart Contents Startup Company 1st\* Prize:** Whoyster, National IT industry Promotion Agency (Fall 2011)
- **Smart Home Idea Award Triple 2nd\* Prize:** Korea Association of Smart Home (Fall 2010)
- **SKKU Mobile App Competition Silver\* Prize:** Sungkyunkwan University (Spring 2010)

## SCHOLARSHIPS

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- **Academic Scholarship:** Korea University (Fall 2017)
- **Seoul Accord Scholarship:** Selected student, Sungkyunkwan University (Fall 2011)
- **Jang Yeong-sil Scholarship:** Freshmen for outstanding academic records, Sungkyunkwan University (2007 - 2013)

## EXTRACURRICULAR ACTIVITIES

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- **Study and Open source Coding Club (SOCC)** Seoul, South Korea  
*Organizer, AI division educator* *Dec 2013 - Present*
  - **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* *Jun 2013 - Nov 2013*
  - **Software mentoring course:** Studied agile methods and information retrieval.

## LANGUAGES

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