

# SEONGMIN LEE

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## RESEARCH INTERESTS

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Graph Mining, Data Mining, Transfer Learning, Text Mining, Natural Language Processing

## EDUCATION

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**Seoul National University** Mar. 2016 - Present  
Candidate for *B.S.* in Electrical and Computer Engineering (*Summa Cum Laude expected*)

**Korea Science Academy of KAIST** Mar. 2013 - Feb. 2016  
Math and science specialized high school, 1 year early entrance

## RESEARCH EXPERIENCES

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**Data Mining Laboratory, Seoul National University** Jan. 2020 - Present  
*Research Internship (Advisor: Prof. U Kang)*

- **Multi-EPL:** Algorithm for accurate multi-source domain adaptation
  - Train a model without labels for the target dataset by using knowledge from other relevant datasets
  - Solved the limitations of the existing methods of not considering shifts among source domains and multi-mode structures that differently labeled data follow distinct distributions
  - Further enhanced the performance by using multiple feature extractors for ensemble learning
- **AUBER:** Automated BERT Regularization
  - Investigated the problem of BERT that the tasks less than 10,000 training data are hard to fine-tune
  - Exploited reinforcement learning to prune the attention heads from BERT for a better regularization

**Communication and Machine Learning Laboratory, Seoul National University** Sep. 2019 - Apr. 2020  
*Research Internship and Bachelor's Thesis (Advisor: Prof. Jungwoo Lee)*

- **DropGradient:** Algorithm to resolve class imbalance problem in semantic segmentation
  - Identified various types of class imbalance such as object size, frequency, and the number of pixels in semantic segmentation
  - Demonstrated the effect of data imbalance on the model performance experimentally and theoretically
  - Presented an algorithm, DropGradient, to recover the performance degradation, by applying importance sampling on gradient norm

**Biomedical Precision Engineering Laboratory, The University of Tokyo** Jul. 2018 - Aug. 2018  
*Research Internship (Advisor: Prof. Keiichi Nakagawa, Dr. Ayumu Ishijima)*

- **Observation of Interaction between Human Cell and Acoustic Wave**
  - Constructed a microscopic motion-picture camera system with the temporal resolution of sub-nano second level and the spatial resolution of micrometer level using optical equipment and laser
  - Generated acoustic wave using laser pump beam with the duration time of 35fs and observed the short-term interaction between HeLa cells and the acoustic wave
  - Processed the images taken from the camera system to clearly reveal the interaction

## PREPRINT

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**Seongmin Lee**, Hyunsik Jeon, and U Kang, “Ensemble Multi-Source Domain Adaptation with Pseudolabels” [arXiv]

Hyun Dong Lee\*, **Seongmin Lee\***, and U Kang, “AUBER: Automated BERT Regularization” [arXiv]

(\* these authors contributed equally to this work)

## PATENT

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**Seongmin Lee**, Hyun Dong Lee, and U Kang, "Pruning Method for Attention Head in Transformer Neural Network for Regularization and Apparatus Thereof", 10-2020-0162397 (27 Nov 2020)

## HONORS and AWARDS

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**The Presidential Science Scholarship**, *Korea Student Aid Foundation* Mar. 2016 - Dec. 2019  
Full tuition and stipend of USD 5K per year (around 150 students selected nationally)

**SNU Engineering Honor Society, STEM**, *Seoul National University* Mar. 2018 - Present  
Used to be Vice president, currently Honorary member of STEM

**Student Reporter Scholarship**, *Seoul National University* Mar. 2018 - Dec. 2020  
USD 3K per year

**Voluntary Service Award**, *Electrical and Computer Eng., Seoul National University* Dec. 2018, Dec. 2017  
Awarded for greatly contributing to the department and conducting a lot of volunteer activities

## COURSE PROJECTS

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**Multi-pipelined CPU with cache and DMA**, Computer Organization Spring 2019  
Implemented multi-pipelined CPU architecture including cache and DMA using Verilog

**EDSR platform for mobile cell phone**, Creative Engineering Design Fall 2018  
Implemented EDSR (Enhanced Deep Residual network for Super Resolution) using TensorFlow and Caffe2 to operate the program on mobile phones

## CONFERENCE

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**AIIS Retreat**, *Seoul National University* Jun. 2020  
Poster presentation about *Multi-Source Domain Adaptation with Pseudo-labels*

## TEACHING EXPERIENCES

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**Deep Learning Course for SK Hynix**, Lab session lecturer Nov. 2020

**Introduction to Algorithm**, Undergraduate student tutor Fall 2020

**Introduction to Algorithm**, Undergraduate student tutor Fall 2019

**Introduction to Physics I**, Undergraduate student tutor Spring 2017

## SKILLS

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**Programming Languages** C/C++, Python, Java, Verilog, MATLAB

**Frameworks** Tensorflow, PyTorch, Caffe2

**English Skill** iBT: 109 (R28, L28, S26, W27), GRE: Verbal 163, Writing 4.5

## EXTRA-CURRICULAR ACTIVITIES

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**SNU Buddy**, *Seoul National University* Sep. 2020 - Dec. 2020  
Buddy program for the international exchange students

**Northeast Asia Student Round Table (SRT)** Aug. 2019  
Participated in the international debate meeting with students from six Northeast Asian countries as a Korean delegate

**Young Generation Forum (YGF)**, *The Korean Federation of Science and Technology Societies* Jun. 2018  
Participated as a representative of Korean students and discussed the direction of engineering with the students from all over the world

**Student Vice President**, *Electrical and Computer Eng., Seoul National University* Nov. 2017 - Oct. 2018  
Elected as a vice president of the department of Electrical and Computer Engineering

**Student Reporter**, *Electrical and Computer Eng., Seoul National University* Sep. 2017 - Feb. 2021  
Published brochures about the department every semester

## VOLUNTEER EXPERIENCE

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**Vision Mentoring**, *Seoul National University*

Jul. 2019

Organized and gave lectures on engineering for high school students (More than 700 students attended)

**Dream Camp Mentoring**, *Seoul National University*

Feb. 2019, Feb. 2018

Conducted mentoring program about “how to materialize one’s dream” for high school students in countryside

**Talent Sharing Volunteer Camp**, *Korea Student Aid Foundation*

Jan. 2017, Aug. 2016

Conducted self-planned mentoring programs for elementary school students in underprivileged areas