

# Seonwoo Min

APPLIED SCIENTIST · AMAZON

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“Sometimes you win. Sometimes you learn.”

## Work Experience

### Amazon

Seattle, United States

Applied Scientist, Stores Foundational AI

Jan 2025 -

- Rufus - Generative AI-powered conversational shopping experience

Applied Scientist, AWS Health AI

Oct 2023 - Jan 2025

- Comprehend Medical - Building NLP solutions for healthcare

### NAVER Cloud - Hyperscale AI Information Extraction Team

Seongnam, South Korea

Research Intern

May 2023 - Sep 2023

- Uncertainty Estimation for Large Language Models

### LG AI Research - Fundamental Research Laboratory

Magok, South Korea

Research Scientist

Aug 2021 - Sep 2022

- Language-Vision Supervision for Domain Generalization

### NAVER Clova - Optical Character Recognition Team

Seongnam, South Korea

Research Intern

Jul 2019 - Aug 2019

- Self-Supervised Training of Protein Language Models

## Education

### Seoul National University

Seoul, South Korea

Ph.D. in Electrical and Computer Engineering

Mar 2015 - Aug 2021

- Data Science & Artificial Intelligence Laboratory (Advisor: Prof. Sungroh Yoon)
- Representation Learning for Biological Sequence Data

B.S. in Electrical and Computer Engineering

Mar 2011 - Feb 2015

- Cum Laude (GPA: 3.64/4.3)

## Selected Publications

Grounding Visual Representations With Texts for Domain Generalization

ECCV 2022

**Seonwoo Min**, Nokyung Park, Siwon Kim, Seunghyun Park, Jinkyu Kim

40+ Citations

Pre-training of Protein Sequence Representations With Structural Information

IEEE Access 2021

**Seonwoo Min**, Seunghyun Park, Siwon Kim, Hyun-Soo Choi, Sungroh Yoon

MLCB Workshop 2019 (**Oral**)

50+ Citations

Deep Learning Improves Prediction of CRISPR-Cpf1 Guide RNA Activity

Nature Biotechnology 2018

Hui Kwon Kim\*, **Seonwoo Min**\*, Myungjae Song, Soobin Jung, Jae Woo Choi, Younggwang Kim,

ISMB Highlight Track 2018 (**Oral**)

Sangeun Lee, Sungroh Yoon, Hyongbum Henry Kim (**\*Co-first Authors**)

300+ Citations

Deep Learning in Bioinformatics

Briefings in Bioinformatics 2017

**Seonwoo Min**, Byunghan Lee, Sungroh Yoon

1900+ Citations

## Awards, Honors, and Scholarships

### Awards

Winner (6/4-lead) & Runner-up (12/3/2-lead)	PhysioNet/Computing in Cardiology Challenge	2021
Nomination Award	Schmidt Science Fellowship	2021
<b>BK21 Plus Outstanding Researcher Award</b>	<b>Minister of Education, South Korea</b>	<b>2020</b>
National R&D Excellence Top 100 Award	Ministry of Science and ICT, South Korea	2019
Travel Award	Neural Information Processing Systems LMRL	2019
Research Excellence Award	Biological Research Information Center, South Korea	2018
Outstanding Highly-cited Paper Award	Electrical and Computer Engineering Department, SNU	2018
Distinguished TA Award	Innovation Center for Engineering Education, SNU	2018
Nomination Award	Microsoft Research Asia Fellowship	<b>2018</b>
Highly-cited Paper Paper Award	Briefings in Bioinformatics, Oxford University Press	2017
Travel Award	Neural Information Processing Systems	2017
Gold Award (Individual) & Silver Award (Team)	Korea University Ski Team Association Championship	2015

### Honors

Chief Graduate Student	Data Science & Artificial Intelligence Laboratory, SNU	2020
Assistant Chief Graduate Student	Data Science & Artificial Intelligence Laboratory, SNU	2019
Graduate Student of the Year	Data Science & Artificial Intelligence Laboratory, SNU	2018
<b>Captain</b>	<b>Seoul National University Ski Team</b>	<b>2015</b>

### Scholarships

<b>Global Ph.D. Fellowship (~ \$100,000)</b>	<b>National Research Foundation of Korea</b>	<b>2016 - 2020</b>
Global Capability Enhancement Program (~ \$6,000)	National Research Foundation of Korea	2018 - 2019
National Science Scholarship (~ \$25,000)	Korea Student Aid Foundation	2011 - 2014

## Academic/Industry Activities

### Mentoring

AWS AI/ML Scholarship Program	Jun 2024 - Oct 2024
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### Invited Talks

Oasis of Knowledge	<i>Hyperscale AI, NAVER Cloud</i>	Sep 2023
Open Tech Seminar	<i>LG AI Research</i>	Dec 2021
Summer Conference	<i>Korean Institute of Electronics and Information Engineers</i>	Jun 2018
Korea Computer Congress	<i>Korean Institute of Information Scientists and Engineers</i>	Jun 2018
Invited Seminar	<i>Korea Institute of Radiology &amp; Medical Sciences</i>	Sep 2017
Bioinformatics Research Exchange	<i>Bioinformatics Institute of Seoul National University</i>	Apr 2017
Invited Seminar	<i>Laboratory of Genome Editing, Yonsei University</i>	Dec 2016

### Reviewer

International Conference on Learning Representations		2021 - 2025
International Conference on Machine Learning	<i>Top Reviewer in 2020</i>	2020 - 2025
Neural Information Processing Systems	<i>Top Reviewer in 2019</i>	2019 - 2025
Annual AAAI Conference on Artificial Intelligence		2025
Nature Communications		2024
Journal of Chemoinformatics		2023
Methods		2017 & 2021

## Republic of Korea Patents

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- Deep Learning Based System for Evaluating the RNA-Guided Nuclease Activity Sept 2019  
Hui Kwon Kim\*, **Seonwoo Min\***, Myungjae Song, Soobin Jung, Sungroh Yoon, and Hyongbum Kim
- System and Method for Generating Sequences of Personal Authentication Sept 2019  
Ho Bae, **Seonwoo Min**, and Sungroh Yoon

## All Publications

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### Conferences

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- Pure Transformers Are Powerful Graph Learners NeurIPS 2022  
Jinwoo Kim, Dat Nguyen, **Seonwoo Min**, Sungjun Cho, Moontae Lee, Honglak Lee, Seunghoon Hong  
**200+ Citations**
- Transformers Meet Stochastic Block Models NeurIPS 2022  
Sungjun Cho, **Seonwoo Min**, Jinwoo Kim, Moontae Lee, Honglak Lee, Seunghoon Hong
- Grounding Visual Representations With Texts for Domain Generalization ECCV 2022  
**Seonwoo Min**, Nokyoung Park, Siwon Kim, Seunghyun Park, Jinkyu Kim
- Towards High Generalization Performance on Electrocardiogram Classification Computing in Cardiology 2021  
Hyeongrok Han, Seongjae Park, **Seonwoo Min**, Hyun-Soo Choi, Eunji Kim, Hyunki Kim, Sangha Park, Jinkook Kim, Junsang Park, Junho An, Kwanglo Lee, Wonsun Jeong, Sangil Chon, Kwonwoo Ha, Myungkyu Han, Sungroh Yoon  
Winner (6, 4-lead) and Runner-up (12, 3, 2-lead) in PhysioNet Challenge
- Bag of Tricks for Electrocardiogram Classification With Deep Neural Networks Computing in Cardiology 2020  
**Seonwoo Min**, Hyun-Soo Choi, Hyeongrok Han, Minji Seo, Jin-Kook Kim, Junsang Park, Sunghoon Jung, Il-Young Oh, Byunghan Lee, Sungroh Yoon  
6th Place in PhysioNet Challenge
- Deep Recurrent Neural Network-Based Identification of Precursor MicroRNAs NeurIPS 2017  
Seunghyun Park, **Seonwoo Min**, Hyun-Soo Choi, Sungroh Yoon  
**100+ Citations**
- Neural Universal Discrete Denoiser NeurIPS 2016  
Taesup Moon, **Seonwoo Min**, Byunghan Lee, Sungroh Yoon

### Journals

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- Polyphonic Music Generation With Sequence Generative Adversarial Networks Journal of KIISE 2024  
Sang-gil Lee, Uiwon Hwang, **Seonwoo Min**, Sungroh Yoon
- Contrastive Time-Series Anomaly Detection TKDE 2023  
Hyungi Kim, Siwon Kim, **Seonwoo Min**, and Byunghan Lee
- Massively Parallel Evaluation of the Activities and Specificities of 17 Small Cas9s Nature Methods 2023  
Sang-Yeon Seo, **Seonwoo Min**, Sungtae Lee, Jung Hwa Seo, Jinman Park, Hui Kwon Kim, Myungjae Song, Dawoon Bae, Sung-Rae Cho, Hyongbum Henry Kim
- Deep Learning to Predict the Editing Efficiencies and Outcomes of Diverse Base Editors Nature Biotechnology 2023  
Nahye Kim, Sungchul Choi, Sungjae Kim, Myungjae Song, Jung Hwa Seo, **Seonwoo Min**, Jinman Park, Sung-Rae Cho, Hyongbum Henry Kim
- Sniper2L, a High-Fidelity Cas9 Variant With High Activity Nature Chemical Biology 2023  
Young-hoon Kim, Nahye Kim, Ikenna Okafor, Sungchul Choi, **Seonwoo Min**, Joonsun Lee, Keunwoo Choi, Janice Choi, Vinayak Harihar, Youngho Kim, Jin-Soo Kim, Jungjoon K. Lee, Taekjip Ha, Hyongbum Henry Kim

Improving Generalization Performance of Electrocardiogram Classification Models *Physiological Measurement* 2023  
Hyeongrok Han, Seongjae Park, **Seonwoo Min**, Hyun-Soo Choi, Eunji Kim, Hyunki Kim, Sangha Park, Jinkook Kim, Junsang Park, Junho An, Kwanglo Lee, Wonsun Jeong, Sangil Chon, Kwonwoo Ha, Myungkyu Han, Sunghroh Yoon

TargetNet: Functional microRNA Target Prediction With Deep Neural Networks *Bioinformatics* 2022  
**Seonwoo Min**, Byunghan Lee, Sunghroh Yoon

DNA Privacy: Analyzing Malicious DNA Sequences Using Deep Neural Networks *TCBB* 2022  
Ho Bae, **Seonwoo Min**, Hyun-Soo Choi, Sunghroh Yoon

Generation of a More Efficient Prime Editor 2 by the Rad51 DNA-Binding Domain *Nature Communications* 2021  
Myungjae Song, Jung Min Lim, **Seonwoo Min**, Jeong-Seok Oh, Dong Young Kim, Jae-Sung Woo, Hiroshi Nishimasu, Sung-Rae Cho, Sunghroh Yoon, Hyongbum Henry Kim  
**50+ Citations**

Pre-training of Protein Sequence Representations With Structural Information *IEEE Access* 2021  
**Seonwoo Min**, Seunghyun Park, Siwon Kim, Hyun-Soo Choi, Sunghroh Yoon  
**50+ Citations**  
*MLCB Workshop 2019 (Oral)*

Protein Transfer Learning Improves Identification of Heat Shock Protein Families *PLOS ONE* 2021  
**Seonwoo Min**, Hyungi Kim, Byunghan Lee, Sunghroh Yoon

Learned Embeddings From Deep Learning to Visualize and Predict Protein Sets *Current Protocols* 2021  
Christian Dallago, Konstantin Schütze, Michael Heinzinger, Tobias Olenyi, Maria Littmann, Amy X. Lu, Kevin K. Yang, **Seonwoo Min**, Sunghroh Yoon, James T. Morton, Burkhard Rost  
*NeurIPS LMRL Workshop 2020*  
**50+ Citations**

Recording of Temporal Information About Biological Events Using Cas9 *Cell* 2021  
Jihye Park, Jung Min Lim, Seok-Jae Heo, Jinman Park, Yoojin Chang, Hui Kwon Kim, Dongmin Jung, Ji Hea Yu, **Seonwoo Min**, Sunghroh Yoon, Sung-Rae Cho, Inkyung Jung, Taeyoung Park, Hyongbum Henry Kim

Predicting the Efficiency of Prime Editing Guide RNAs in Human Cells *Nature Biotechnology* 2020  
Hui Kwon Kim, GooSang Yu, Jinman Park, **Seonwoo Min**, Sungtae Lee, Sunghroh Yoon, Hyongbum Henry Kim  
**200+ Citations**

Prediction of the Sequence-Specific Cleavage Activity of Cas9 Variants *Nature Biotechnology* 2020  
Nahye Kim, Hui Kwon Kim, Sungtae Lee, Jung Hwa Seo, Jae Woo Choi, Jinman Park, **Seonwoo Min**, Sunghroh Yoon, Sung-Rae Cho, Hyongbum Henry Kim  
**100+ Citations**

Sequence-Specific Prediction of the Efficiencies of Adenine and Cytosine Base Editors *Nature Biotechnology* 2020  
Myungjae Song, Hui Kwon Kim, Sungtae Lee, Younggwang Kim, Sang-Yeon Seo, Jinman Park, Nahye Kim, Jae Woo Choi, Hyewon Jang, Jeong Hong Shin, **Seonwoo Min**, Jhejiu Quan, Jihun Kim, Hoon-Chul Kang, Sunghroh Yoon, Hyongbum Henry Kim  
**100+ Citations**

High-Throughput Analysis of xCas9, SpCas9-NG and SpCas9 in Human Cells *Nature Biomedical Engineering* 2020  
Hui Kwon Kim, Sungtae Lee, Younggwang Kim, Jinman Park, **Seonwoo Min**, Jae Woo Choi, Tony Huang, Sunghroh Yoon, David Liu, Hyongbum Henry Kim  
**100+ Citations**

SpCas9 Activity Prediction by DeepSpCas9 With High Generalization Performance *Science Advances* 2019  
Hui Kwon Kim, Younggwang Kim, Sungtae Lee, **Seonwoo Min**, Jung Yoon Bae, Jae Woo Choi, Jinman Park, Dongmin Jung, Sunghroh Yoon, Hyongbum Henry Kim  
**200+ Citations**

Learning-Based Instantaneous Drowsiness Detection Using Wired and Wireless EEG *IEEE Access* 2019  
Hyun-Soo Choi, **Seonwoo Min**, Siwon Kim, Ho Bae, Jee-Eun Yoon, Inha Hwang, Dana Oh, Chang-Ho Yun, Sunghroh Yoon

Deep Learning Improves Prediction of CRISPR-Cpf1 Guide RNA Activity  
Hui Kwon Kim\*, **Seonwoo Min\***, Myungjae Song, Soobin Jung, Jae Woo Choi, Younggwang Kim,  
Sangeun Lee, Sungroh Yoon, Hyongbum Henry Kim (**\*Co-first Authors**)

*Nature Biotechnology* 2018  
*ISMB Highlights Track 2018 (Oral)*

**300+ Citations**

Deep Learning in Bioinformatics  
**Seonwoo Min**, Byunghan Lee, Sungroh Yoon

*Briefings in Bioinformatics* 2017

**1900+ Citations**

## **ArXiv** .....

Supervised Neural Discrete Universal Denoiser for Adaptive Denoising  
Sungmin Cha\*, **Seonwoo Min\***, Sungroh Yoon and Taesup Moon (**\*Co-first Authors**)

*ArXiv* 2021