

Seongmin Lee

CS PhD student at Georgia Tech

My research bridges machine learning and human-computer interaction to advance **Responsible AI**. I design and develop **novel visual explanations** for complex machine learning models, and **scalable algorithms** that promote accountable use of AI.

I have collaborated with researchers and developers at JP Morgan Chase & Co., Cisco Systems, IBM Research, and AVAST Software.

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🎓 Google Scholar

Education

- Aug. 2021 — Present **Ph.D. in Computational Science & Engineering**
Georgia Institute of Technology, Atlanta, GA
Advisor: Duen Horng (Polo) Chau
- Mar 2016 — Feb. 2021 **B.S. in Electrical and Computer Engineering**
Seoul National University, Seoul, South Korea
Graduated with Summa Cum Laude, Overall GPA: 3.91/4.00, Major GPA: 3.94/4.00
- Mar 2013 — Feb. 2016 **Math and Science Specialized High School for Gifted**
Korea Science Academy of KAIST, Busan, South Korea
One year early entrance, Graduated with distinction in GPA

Research Experience

- May 2024 — Aug. 2024 **JP Morgan Chase & Co.**, New York, NY
Summer Associate, Research Technologies Program
Mentor: Hsiang Hsu, Chun-Fu (Richard) Chen
- May 2022 — Jul. 2022 **Cisco Systems, Inc.**, San Jose, CA
Ph.D. Intern
Mentor: Ali Payani
Led model interpretation and visualization development for an open-source project for Responsible AI
- Aug. 2021 — Present **Georgia Institute of Technology**, Atlanta, GA
Graduate Research Assistant, School of Computational Science and Engineering
Advisor: Duen Horng (Polo) Chau
- Jan. 2020 — Feb. 2021 **Seoul National University**, Seoul, South Korea
Undergraduate Research Intern, Data Mining Lab
Advisor: U Kang
- Sep. 2019 — Apr. 2020 **Seoul National University**, Seoul, South Korea
Undergraduate Research Intern, Communication and Machine Learning Laboratory
Advisor: Jungwoo Lee
- Jul. 2018 — Aug. 2018 **The University of Tokyo**, Tokyo, Japan
Undergraduate Research Intern, Biomedical Precision Laboratory
Advisor: Keiichi Nakagawa, Ayumu Ishijima
Constructed a microscopic motion-picture laser camera with sub-nano spatial/temporal resolution, Investigated interaction between human cells and acoustic waves in collaboration with students majoring in biology and physics

Honors and Awards

2023	Next-generation Science and Technology Leader NET Research grant of \$1,500 funded by KOFST. Conducted interdisciplinary research on 'Wearable Devices and AI to Enhance Sustainability and Reliability of Korean Healthcare Data' with 5 other students.
2016 - 2019	The Presidential Science Scholarship Full tuition and stipend of \$5,000 per year. Around 150 students are selected nationally.
2018 - 2019	SNU Engineering Honor Society (STEM) Used to be vice president, currently honorary member of STEM.
2017, 2018	Seoul National University ECE Voluntary Service Award Selected based on the evaluation of the students, staffs, and faculty members of department of ECE.
2014 - 2015	Hansung Sonjaehan Scholarship Stipend of \$5,000 per year. Around 150 high school students studying math and science are selected nationally.

Publications

Transformer Explainer: Interactive Learning of Text-Generative Models

Aeree Cho, Grace C Kim, Alexander Karpekov, Alec Helbling, Zijie J. Wang, Seongmin Lee, Benjamin Hoover, Duen Horng (Polo) Chau

Poster, IEEE Visualization Conference (VIS). 2024.

[Project](#) [PDF](#) [Recording](#) [Code \(★2.3k\)](#) [BibTeX](#)

Diffusion Explainer: Visual Explanation for Text-to-image Stable Diffusion

Seongmin Lee, Benjamin Hoover, Hendrik Strobelt, Zijie J. Wang, ShengYun Peng, Austin P. Wright, Kevin Li, Haekyu Park, Haoyang Yang, Duen Horng (Polo) Chau

Short Paper, IEEE Visualization Conference (VIS). Tampa, USA, 2024.

[Project](#) [Demo](#) [PDF](#) [Recording](#) [Poster](#) [Code \(★191\)](#) [BibTeX](#)

LLM Attributor: Interactive Visual Attribution for LLM Generation

Seongmin Lee, Zijie J. Wang, Aishwarya Chakravarthy, Alec Helbling, ShengYun Peng, Mansi Phute, Duen Horng (Polo) Chau, Minsuk Kahng

Poster, IEEE Visualization Conference (VIS). 2024.

[Project](#) [PDF](#) [Recording](#) [Code](#) [BibTeX](#)

SuperNOVA: Design Strategies and Opportunities for Interactive Visualization in Computational Notebooks

Zijie J. Wang, David Munechika, Seongmin Lee, Duen Horng (Polo) Chau

Extended Abstracts on ACM Human Factors in Computing Systems (CHI). 2024.

[Project](#) [Demo](#) [PDF](#) [Code \(★61\)](#) [BibTeX](#)

UniTable: Towards a Unified Framework for Table Structure Recognition via Self-Supervised Pretraining

ShengYun Peng, Seongmin Lee, Xiaojing Wang, Rajarajeswari Balasubramaniyan, Duen Horng (Polo) Chau
ArXiv. 2024.

[Project](#) [PDF](#) [Code \(★331\)](#) [BibTeX](#)

ClickDiffusion: Harnessing LLMs for Interactive Precise Image Editing

Alec Helbling, Seongmin Lee, Duen Horng (Polo) Chau

CVPR 2024 Workshop on AI for Content Creation Workshop (CVPR). 2024.

[Project](#) [PDF](#) [Code \(★64\)](#) [BibTeX](#)

Mobile Fitting Room: On-device Virtual Try-on via Diffusion Models

Justin Blalock, David Munechika, Harsha Karanth, Alec Helbling, Pratham Mehta, Seongmin Lee, Duen Horng (Polo) Chau

CVPR 24 Workshop on Virtual Try-On (CVPR). 2024.

[Project](#) [PDF](#) [BibTeX](#)

High-Performance Transformers for Table Structure Recognition Need Early Convolutions

ShengYun Peng, Seongmin Lee, Xiaojing Wang, Rajarajeswari Balasubramanian, Duen Horng (Polo) Chau
Oral Paper, Neural Information Processing Systems (NeurIPS) TRL Workshop (TRL). New Orleans, LA, USA, 2023.

[Project](#) [PDF](#) [Code](#) [BibTeX](#)

VisGrader: Automatic Grading of D3 Visualizations

Matthew Hull, Vivian Pednekar, Hannah Murray, Nimisha Roy, Emmanuel Tung, Susanta Routray, Connor Guerin, Justin Chen, Zijie J. Wang, Seongmin Lee, Mahdi Roozbahani, Duen Horng (Polo) Chau
Full Paper, IEEE Visualization and Visual Analytics (VIS). Melbourne, Australia, 2023.

[Project](#) [PDF](#) [Code](#) [BibTeX](#)

Concept Evolution in Deep Learning Training: A Unified Interpretation Framework and Discoveries

Haekyu Park, Seongmin Lee, Benjamin Hoover, Austin Wright, Omar Shaikh, Rahul Duggal, Nilaksh Das, Judy Hoffman, Duen Horng (Polo) Chau
Full Paper, ACM International Conference on Information and Knowledge Management (CIKM). Birmingham, United Kingdom, 2023.

[Project](#) [PDF](#) [Code](#) [BibTeX](#) [DOI](#)

Explaining Website Reliability by Visualizing Hyperlink Connectivity

Seongmin Lee, Sadia Afroz, Haekyu Park, Zijie J. Wang, Omar Shaikh, Vibhor Sehgal, Ankit Peshin, Duen Horng (Polo) Chau
Short Paper, IEEE Visualization and Visual Analytics (VIS). Oklahoma City, OK, USA, 2022.

[Project](#) [Demo](#) [PDF](#) [BibTeX](#)

NOVA: A Practical Method for Creating Notebook-Ready Visual Analytics

Zijie J. Wang, David Munechika, Seongmin Lee, Duen Horng (Polo) Chau
Poster Paper, IEEE Visualization and Visual Analytics (VIS). Oklahoma City, OK, USA, 2022.

[Project](#) [Demo](#) [PDF](#) [Poster](#) [Code](#) [BibTeX](#)

VisCUIT: Visual Auditor for Bias in CNN Image Classifier

Seongmin Lee, Zijie J. Wang, Judy Hoffman, Duen Horng (Polo) Chau
Demo Paper, Conference on Computer Vision and Pattern Recognition (CVPR). New Orleans, LA, USA, 2022.

[Project](#) [Demo](#) [PDF](#) [Recording](#) [Code](#) [BibTeX](#)

MisVis: Explaining Web Misinformation Connections via Visual Summary

Seongmin Lee, Sadia Afroz, Haekyu Park, Zijie J. Wang, Omar Shaikh, Vibhor Sehgal, Ankit Peshin, Duen Horng (Polo) Chau
Extended Abstracts on ACM Human Factors in Computing Systems (CHI). New Orleans, LA, USA, 2022.

[Project](#) [Demo](#) [PDF](#) [BibTeX](#) [DOI](#)

Multi-EPL: Accurate Multi-source Domain Adaptation

Seongmin Lee, Hyunsik Jeon, U Kang
Public Library of Science (PLOS ONE). 2021.

[Project](#) [PDF](#) [Code](#) [BibTeX](#)

Unsupervised multi-source domain adaptation with no observable source data

Hyunsik Jeon, Seongmin Lee, U Kang
Public Library of Science (PLOS ONE). 2021.

[Project](#) [PDF](#) [Code](#) [BibTeX](#)

Auber: Automated BERT Regularization

Hyun Dong Lee*, Seongmin Lee*, U Kang
Public Library of Science (PLOS ONE). 2021.

[Project](#) [PDF](#) [Code](#) [BibTeX](#) *Authors contributed equally

Patent

Pruning Method for Attention Head in Transformer Neural Networks for Regularization and Apparatus Thereof

Seongmin Lee, Hyun Dong Lee, U Kang
10-2020-0162397, 2020.

Book

I Got to Wish to Go Engineering School

SNU Engineering Honor Society (STEM)

Megastudy Books, 2021.

Wrote Part 3 "Life as a Lab Intern"

Talks

Expanding Your Career Canvas: Pitching Strategies for Diverse Audiences

Aug 2024 Fostering Innovation in Rising Experts (FIRE) at United States-Korea Conference (UKC)

Diffusion Explainer: Diffusion Explainer: Visual Explanation for Text-to-image Stable Diffusion

Nov 2023 Georgia Tech, School of CSE Recruiting Event

STEM Global Engineer Seminar

May 2023 Seoul National University, SNU Engineering Honor Society (STEM)

MisVis: Explaining Website Reliability by Visualizing Hyperlink Connectivity

Nov. 2022 Georgia Tech, School of CSE Recruiting Event

Mar. 2022 AVAST Software, Fake News Monthly Sync Up

Multi-Source Domain Adaptation with Pseudo-labels

Jun. 2020 Seoul National University, AIIS Retreat

STEM Vision Mentoring

Jul. 2019 Seoul National University, STEM Vision Mentoring

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

Teaching

Graduate Teaching Assistant

Spring 2024 *Georgia Institute of Technology, Atlanta, GA*

Data and Visual Analytics (CSE6242), Instructor: Duen Horng (Polo) Chau, Mahdi Roozbahani
Online course with 1201 graduate students enrolled.

Graduate Teaching Assistant

Fall 2022 *Georgia Institute of Technology, Atlanta, GA*

Data and Visual Analytics (CSE6242), Instructor: Duen Horng (Polo) Chau, Mahdi Roozbahani
Online course with 1146 graduate students enrolled.

Lab Session Lecturer

Jan. 2021 *LG Chem, Seoul, South Korea*

Deep Learning Course

Lab Session Lecturer

Nov. 2020 *SK Hynix, Seoul, South Korea*

Deep Learning Course

Undergraduate Student Tutor

Fall 2020, Fall 2019 *Seoul National University, Seoul, South Korea*

Introduction to Algorithm

Selected as tutor for two consecutive years based on interviews and academic performance

Undergraduate Student Tutor

Spring 2017

Seoul National University, Seoul, South Korea
Introduction to Physics I
Selected as tutor based on academic performance

Mentoring

- Fall 2021 — Present **David Munechika**
B.S. in Computer Science, Georgia Institute of Technology
- Fall 2021 — Spr. 2023 **Kevin Li**
B.S. in Computer Science and Biomedical Engineering, Georgia Institute of Technology
Now: ML Ph.D at Carnegie Mellon University
- Fall 2021 — Spr. 2023 **Alex Yang**
M.S. in Computer Science, Georgia Institute of Technology
Now: Software Engineer at Goldman Sachs
- Fall 2021 — Spr. 2022 **Omar Shaikh**
B.S. in Computer Science, Georgia Institute of Technology
🏆 Sigma Xi Best Undergraduate Research Award, Georgia Institute of Technology
Now: CS Ph.D at Stanford University

Grants and Funding

- 2024 **Democratizing Visual AI: Enhancing Efficiency and Usability of Large Vision Models for Fostering Under-Resourced Access**
NSF Medium Grant
Co-PIs: Judy Hoffman, Celine Lin, Duen Horng (Polo) Chau
Co-authored winning proposal. Contributed to experiment with on-device implementation of the CLIP model.
- 2023 **Scaling Up Educators' Capacities: Automating Visualization Assessment via Generative AI**
Google Award for Inclusion Research
Co-PIs: Duen Horng (Polo) Chau
Co-authored a proposal resulting in \$60k resesarch funding from Google.
- 2022 **Cisco Research Funding**
Co-PIs: Duen Horng (Polo) Chau
Co-authored a proposal resulting in \$200k resesarch funding on responsible AI from Cisco.

Service

Reviewer

7th Workshop on Visualization for AI Explainability (**VISxAI**), 2024
ACM Conference On Computer-Supported Cooperative Work and Social Computing (**CSCW**), 2023

Institutional

- 2022 – Present **Georgia Tech CSE Website Committee**
Improve external and internal communication in collaboration with a communication officer and faculty members
- 2021 – Present **Georgia Tech Korean Student Association**
Serve as a treasury and web administrator
- 2020 **SNU Buddy**
Selected as the best buddy out of over 60 buddy students based on the votes from international exchange students.
- 2017 – 2018 **Seoul National University ECE Student Vice President**
Elected from student vote.
- 2017 – 2021 **Seoul National University ECE Student Reporter**
Published a magazine about research, people, and events of Department of ECE every semester.
- 2018, 2019 **Dream Camp Mentoring**
Conducted mentoring program about "how to materialize one's dream" for high school students in countryside

2016, 2017 **KOSAF Talent Sharing Volunteer Camp**
Conducted self-planned mentoring for elementary school students in underprivileged areas in Korea

Member

2021 - Present Association for Computing Machinery (**ACM**)
2021 - Present Institute of Electrical and Electronics Engineers (**IEEE**)
2018 — 2019 SNU Engineering Honor Society (**STEM**)

References

Dr. Polo Chau, Associate Professor
School of Computational Science and Engineering
Georgia Institute of Technology
cc.gatech.edu/~dchau/