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 Cisco Systems, IBM Research, and AVAST Software.

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🏠 seongmin.xyz   🐙 @ligi214
📄 CV PDF   🎓 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 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

High-Performance Transformers for Table Structure Recognition Need Early Convolutions
ShengYun Peng, Seongmin Lee, Xiaojing Wang, Rajarajeswari Balasubramaniyan, Duen Horng (Polo) Chau
Oral Paper, Neural Information Processing Systems (NeurIPS) TRL Workshop (TRL). New Orleans, LA, USA, 2023.
🔗 Project   📄 PDF   </> Code   📋 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
Poster Paper, IEEE Visualization Conference (VIS). Melbourne, Australia, 2023.
Demo Paper, VISxAI Workshop at IEEE Visualization Conference (VISxAI). Melbourne, Australia, 2023.
Demo Paper, Conference on Computer Vision and Pattern Recognition (CVPR). Vancouver, Canada, 2023.
🔗 Project   ▶ Demo   📄 PDF   🎥 Recording   🖼 Poster   </> Code (⭐85)   📋 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.
Poster Paper, Artificial Intelligence & Human-Computer Interaction Workshop at ICML (AI&HCI). Honolulu, HI, USA, 2023.
🔗 Project   📄 PDF   </> Code   📋 BibTeX   ⚓ DOI

Towards Mitigating Spurious Correlations in Image Classifiers with Simple Yes-no Feedback
Seongmin Lee, Ali Payani, Duen Horng (Polo) Chau
Poster Paper, Artificial Intelligence & Human-Computer Interaction Workshop at ICML (AI&HCI). Honolulu, HI, USA, 2023.
🔗 Project   📄 PDF   📋 BibTeX

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

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

arXiv:2305.03039 (arXiv). 2023.

🔗 Project ▶ Demo 📄 PDF </> Code 📑 BibTeX

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

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

Fall 2022 · **Graduate Teaching Assistant**

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.

Jan. 2021 · **Lab Session Lecturer**

LG Chem, Seoul, South Korea

Deep Learning Course

Nov. 2020 · **Lab Session Lecturer**

SK Hynix, Seoul, South Korea

Deep Learning Course

Fall 2020, Fall 2019 · **Undergraduate Student Tutor**

Seoul National University, Seoul, South Korea

Introduction to Algorithm
Selected as tutor for two consecutive years based on interviews and academic performanace

Spring 2017 · **Undergraduate Student Tutor**

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

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

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/