

# 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.

✉ seongmin@gatech.edu

🏠 seongmin.xyz

📄 CV PDF

🐦 @SeongminLeee

🔗 @ligi214

🎓 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	<b>Next-generation Science and Technology Leader NET</b> 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	<b>The Presidential Science Scholarship</b> Full tuition and stipend of \$5,000 per year. Around 150 students are selected nationally.
2018 - 2019	<b>SNU Engineering Honor Society (STEM)</b> Used to be vice president, currently honorary member of STEM.
2017, 2018	<b>Seoul National University ECE Voluntary Service Award</b> Selected based on the evaluation of the students, staffs, and faculty members of department of ECE.
2014 - 2015	<b>Hansung Sonjaehan Scholarship</b> Stipend of \$5,000 per year. Around 150 high school students studying math and science are selected nationally.

# Publications

## 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

ArXiv. 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](#) [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 \(★186\)](#) [BibTeX](#)

## ClickDiffusion: Harnessing LLMs for Interactive Precise Image Editing

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

ArXiv. 2024.

[Project](#) [PDF](#) [Code \(★45\)](#) [BibTeX](#)

## 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 \(★131\)](#) [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](#)

### 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, AIIIS 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**

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

## **David Munechika**

Fall 2021 — Present

*B.S. in Computer Science, Georgia Institute of Technology*

## **Kevin Li**

Fall 2021 — Spr. 2023

*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 research funding from Google.

2022

### **Cisco Research Funding**

Co-PIs: Duen Horng (Polo) Chau

Co-authored a proposal resulting in \$200k research 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/](http://cc.gatech.edu/~dchau/)