

Alexander E. Bendeck

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Research Interests

Large language models for visualization, AI & visualization for education, maps & geographic data

Research & Professional Experience

Capital One, Manager, Data Scientist **June 2026 – Present**

- Support integration of credit risk models, data assets, and analytical processes following Capital One's acquisition of Discover Financial Services
- Evaluate model development workflows, data dependencies, and operational processes to identify opportunities for standardization across card portfolios

Georgia Tech Visualization Lab, Graduate Research Assistant **January 2022 – May 2026**

Advised by Prof. John Stasko

- Developed LLM-based tools to support end-to-end data analysis workflows, including question answering, dataset discovery from Web sources, and data integration
- Designed and evaluated systems to improve efficiency and accuracy of data exploration tasks
- Built geospatial data visualizations to analyze U.S. migration patterns using public datasets

MIT Lincoln Laboratory, Summer Research Program Intern **May 2025 – August 2025**

Mentored by Ashley Suh and Harry Li in Group 52 (AI Technology & Systems)

- Built an LLM-powered data integration pipeline to automatically merge structured tabular data from local and web sources
- Evaluated system with U.S. Government analysts, demonstrating reductions in manual data integration time and effort

Tableau Research, Research Intern **May 2023 – August 2023**

Mentored by Dennis Bromley and Vidya Setlur

- Developed novel algorithms for trend detection and semantic labeling in time-series data
- Built a now-patented system enabling interactive search over time-series trends

Chu Data Lab, Graduate Research Assistant **August 2021 – December 2021**

Advised by Prof. Xu Chu

- Developed machine learning models for entity resolution using weak supervision techniques
- Improved matching accuracy across noisy datasets by leveraging heuristic labeling functions

Duke Database Research Group, Research Assistant **August 2019 – December 2020**

Advised by Prof. Jun Yang and Prof. Sudeepa Roy

- Designed and implemented an interactive SQL debugging tool to support query validation and error detection
- Developed front-end interfaces and backend query parsing logic

Education

Georgia Institute of Technology (Georgia Tech), Atlanta, GA **August 2021 – May 2026**

Ph.D. in Computer Science

- Advisor: Prof. John Stasko
- Thesis topic: Large Language Models as Virtual Assistants for Visual Data Analysis

M.S. in Computer Science

- Concentration: Machine Learning | GPA: 4.0/4.0
- Courses: Graduate Machine Learning, Data Visualization, Data & Visual Analytics

- Concentration: Data Science | GPA: 4.0/4.0
- Courses: Machine Learning, Data Mining, Statistical Computing, Database Systems

Journal Articles

How Visually Literate are Large Language Models? Reflections on Recent Advances and Future Directions.

- [Alexander Bendeck](#) and John Stasko. *IEEE Computer Graphics and Applications*, vol. 45, no. 6, pp. 120-129, November/December 2025.

An Empirical Evaluation of the GPT-4 Multimodal Language Model on Visualization Literacy Tasks.

- [Alexander Bendeck](#) and John Stasko. *IEEE Transactions on Visualization and Computer Graphics* (Paper presented at IEEE VIS 2024), vol. 31, no. 1, pp. 1105-1115, January 2025.

Ground Truth Inference for Weakly Supervised Entity Matching.

- Renzhi Wu, [Alexander Bendeck](#), Xu Chu, and Yeye He. *Proceedings of the ACM on Management of Data* (Paper presented at ACM SIGMOD 2023), vol. 1, no. 1, article no. 32, 28 pages, May 2023.

Conference & Workshop Papers

DataForager: Integrating and Visualizing Datasets From the Web Using Large Language Models.

- [Alexander Bendeck](#), Harry Li, Steven Gomez, and Ashley Suh. *Proceedings of the ACM Conference on Advanced Visual Interfaces (AVI)*, article no. 27, 9 pages, June 2026.

An Emergent Design Study Methodology for Education: Reflections on the Robin System for Visualizing U.S. Migration Data.

- [Alexander Bendeck](#), Clío Andris, and John Stasko. *Proceedings of the Workshop on Visualization Education, Literacy, and Activities at IEEE VIS*, pp. 1-10, November 2025.

Robin: An Interactive Visualization System and Instructional Tool to Democratize United States Domestic Migration Data.

- [Alexander Bendeck](#), Clío Andris, and John Stasko. *Proceedings of the Hawaii International Conference on System Sciences (HICSS)*, pp. 5216-5225, January 2025.

Effects of Forecast Order, Cost, and Risk on Decision Making with Multiple Forecast Visualizations.

- Laura Matzen, Mallory Stites, Kristin Divis, [Alexander Bendeck](#), John Stasko, and Lace Padilla. *Proceedings of the Workshop on Uncertainty Visualization at IEEE VIS*, pp. 28-37, October 2024.

SlopeSeeker: A Search Tool for Exploring a Dataset of Quantifiable Trends.

- [Alexander Bendeck](#), Dennis Bromley, and Vidya Setlur. *Proceedings of the ACM Conference on Intelligent User Interfaces (IUI)*, pp. 817-836, April 2024.

Text Mining and Spatial Analysis of Yelp Data to Support Socially Vibrant Cities.

- [Alexander Bendeck](#) and Clío Andris. *Proceedings of the 11th International Workshop on Urban Computing*, 10 pages, August 2022.

I-Rex: An Interactive Relational Query Explainer for SQL.

- Zhengjie Miao, Tiangang Chen, [Alexander Bendeck](#), Kevin Day, Sudeepa Roy, and Jun Yang. *Proceedings of the VLDB Endowment (PVLDB), Vol 13, Demonstration Track*, pp. 2997-3000, August 2020.

Teaching Experience

Georgia Tech CSE 6242 (Data & Visual Analytics), Teaching Assistant **August 2024 – May 2026**

- Grade homework assignments and course project deliverables, revise homework assignments, and hold Q&A sessions

Georgia Tech CS 6730 (Data Visualization Principles), Teaching Assistant **Fall 2023**

- Graded assignments, advised students on course projects, and held regular office hours

Duke COMPSCI 230 (Discrete Math), Undergraduate Teaching Assistant **Fall 2020**

- Graded assignments and held regular office hours
Duke COMPSCI 101 (Intro to CS in Python)

Head undergraduate TA **Spring 2019 – Fall 2019**

- Revised course assignments and improved assignment auto-grading system based on student feedback; oversaw grading of assignments by other TAs
- Co-programmed and deployed a web app for exam prep used by over 120 students

Undergraduate TA **Fall 2018**

- Graded assignments and held regular office hours

Duke Mathematics Department, Office hours staff member **Spring 2018**

- Tutored Duke students enrolled in MATH 212 (Multivariable Calculus)

Research Mentorship

▪ **Hanxuan Zhang**, Master's student at Georgia Tech **Spring 2025 – Present**

▪ **Wenxi Hu**, Master's student at Georgia Tech **Spring 2025 – Present**

▪ **Wilson Chen**, Undergraduate student at Georgia Tech **Fall 2024**

Honors & Awards

Georgia Tech Goizueta Foundation Fellow **Fall 2023**

- Received a financial award for exceptional Georgia Tech Ph.D. students of Hispanic and Latino origin

Georgia Tech President's Fellow **Fall 2021**

- Received a 4-year financial award for highly qualified Georgia Tech Ph.D. applicants in the top 10% of their application pool

Phi Beta Kappa Honor Society inductee **Spring 2021**

- Selected based on record of high academic achievement

Duke University Dean's List with Distinction **Fall '17, '18, '19; Spring '18, '19**

- Awarded in every eligible semester for placement in the top 10% of Arts & Sciences undergraduates by GPA

Duke Undergraduate Research Support Small Grant recipient **2018-19 Academic Year**

- Received funding for my work as part of a neuroscience research study team

Florida Engineering Society Scholarship recipient **Spring 2017**

- Received a \$1000 merit scholarship based on high school record and STEM interest

2017 National Merit Scholarship Finalist **Spring 2017**

- Named as a finalist for the 2017 National Merit Scholarship

Service

- **Reviewer:** IEEE VIS Conference (2023, 2024, 2025), EuroVis Conference (2024, 2025), *IEEE TVCG Journal* (2024, 2025), *Information Visualization Journal* (2024), ACM UIST Conference (2025, 2026)

- **Program Committee Member:** PacificVis Conference Short Papers (2026)

Patents

Systems and Methods for Exploring Quantifiable Trends in Line Charts Filed in 2024, Granted

- Inventors: [Alexander Bendeck](#), Dennis Bromley, and Vidya Setlur
- U.S. Patent #12,511,307

Search Tool for Exploring Quantifiable Trends in Line Charts Filed in 2024, Granted

- Inventors: [Alexander Bendeck](#), Dennis Bromley, and Vidya Setlur
- U.S. Patent #12,216,678

Activities & Mentoring

Georgia Tech Latino Organization of Graduate Students

Vice President **Fall 2024 – Summer 2025**

- Assisted the President with administrative duties, helped run executive board meetings, and represented the organization at networking and social events

Internal Outreach Committee chair **Fall 2023 – Summer 2024**

- Organized graduate student mentorship program, faculty panels, and networking opportunities for new and prospective graduate students

Member **Fall 2021 – Present**

- Helping to facilitate mentorship and networking events for graduate students

GVU Brown Bag Talks, Student organizer **Spring 2023**

- Coordinated graduate student “lightning talks” for the GVU Brown Bag seminar series

Duke Statistical Science Majors Union, Member and student mentor **Fall 2020 – Spring 2021**

- Mentored two first-year students interested in data science for the 2020-21 school year

Duke Mi Gente Cultural Organization, Member and student mentor **Fall 2019 – Spring 2021**

- Mentored one first-year student in the “Mi Familia” program for the 2020-21 school year
- Mentored three first-year students in the “Mi Familia” program for the 2019-20 school year

Skills

- **Programming:** Python (NumPy, sklearn, Pandas, PyTorch, Flask), R (dplyr, rshiny, plotly, leaflet), Java, JavaScript (React.js, Vue.js, D3.js), HTML/CSS, MATLAB, SQL
- **Productivity:** Git, GitHub, Zoom, Slack, Microsoft Teams, LaTeX
- **Languages:** English (native language), Spanish (elementary proficiency)