

Emily Wall


My research involves decision making using data visualizations and visual analytics. I develop computational strategies to characterize human limitations in decision making (e.g., cognitive bias) and design interventions to promote reflective data analysis and decision making processes. I am an Assistant Professor in the Computer Science Department at Emory University. I completed my Ph.D. in Computer Science at Georgia Tech in 2020 and was a postdoctoral researcher at Northwestern University 2020-2021.

 emily.wall@emory.edu

 [@profembwall](https://twitter.com/profembwall)

 [Google Scholar](#)

 [LinkedIn](#)

 Math & Science Center
W302E

 [emilywall.github.io](https://github.com/emilywall)

 [PDF of CV](#)

Appointments

2021- **Assistant Professor**
[Department of Computer Science](#)
[Emory University](#)

2020-2021 **Postdoctoral Researcher**
[Department of Computer Science](#)
[Northwestern University](#)

Education

2020 **Ph.D. in Computer Science**
[Georgia Institute of Technology](#)
Thesis: Detecting and Mitigating Human Bias in Visual Analytics
Committee: [Alex Endert](#), [John Stasko](#), [Polo Chau](#), [Brian Fisher](#), [Wenwen Dou](#)

2015 **B.S. in Computer Science & Mathematics**
[University of Georgia](#)
summa cum laude

Honors & Awards

2020 [VGTC Best Dissertation](#), Honorable Mention

2019 [GVU Foley Scholar](#), Recipient, Georgia Institute of Technology

2019 [D.E. Shaw Exploration Fellowship](#), Recipient

2019-2020 [Siemens FutureMaker Fellowship](#), Recipient

2018 [GVU Foley Scholar](#), Finalist, Georgia Institute of Technology

2017 [Graduate Student Symposium](#), Participant, AT&T Labs

2017	Doctoral Colloquium , Participant, IEEE VIS
2017-2020	Graduate Fellowship for STEM Diversity (GFSD) , Recipient
2017	NSF Graduate Research Fellowship Program , Honorable Mention
2017	Department of Defense SMART Fellowship , Recipient (Declined)
2015-2019	President's Fellowship , Recipient, Georgia Institute of Technology
2015	CURO Symposium Best Paper Award , University of Georgia
2014	CURO Research Assistantship , University of Georgia
2014	Hahn Family Scholarship for Computer Science , Recipient, University of Georgia
2013	Hollingsworth Award for Excellence in Mathematics , Recipient, University of Georgia
2012-2015	Zell Miller Scholarship , Recipient, University of Georgia

Publications

Journal Articles

Left, Right, and Gender: Exploring Interaction Traces to Mitigate Human Biases

E. Wall, A. Narechania, A. Coscia, J. Paden, and A. Endert

IEEE Transactions on Visualization and Computer Graphics (Proc. VIS'21), 2021.

[PDF](#) | [Video](#)

Lumos: Increasing Awareness of Analytic Behavior during VisualData Analysis

A. Narechania, A. Coscia, *E. Wall*, and A. Endert

IEEE Transactions on Visualization and Computer Graphics (Proc. VIS'21), 2021.

[PDF](#) | [Video](#)

VitaLITy: Promoting Serendipitous Discovery of Academic Literature with Transformers & Visual Analytics

A. Narechania, A. Karduni, R. Wesslen, and *E. Wall*

IEEE Transactions on Visualization and Computer Graphics (Proc. VIS'21), 2021.

[PDF](#) | [Video](#)

A Heuristic Approach to Value-Driven Evaluation of Visualizations

E. Wall, M. Agnihotri, L. Matzen, K. Divis, M. Haass, A. Endert, and J. Stasko

IEEE Transactions on Visualization and Computer Graphics (Proc. InfoVis'18), 2019.

[PDF](#) | [Talk](#) | [Website](#) | [Video FF](#)

Podium: Ranking Data Using Mixed-Initiative Visual Analytics

E. Wall, S. Das, R. Chawla, B. Kalidindi, E. Brown, and A. Endert

IEEE Transactions on Visualization and Computer Graphics (Proc. VAST'17), 2018.

[PDF](#) | [Talk](#) | [Video](#) | [Video FF](#) | [Demo](#)

AxisSketcher: Interactive Nonlinear Axis Mapping of Visualizations through User Drawings

B.C. Kwon, H. Kim, *E. Wall*, J. Choo, H. Park, and A. Endert

IEEE Transactions on Visualization and Computer Graphics (Proc. VAST'16), 2017.

[PDF](#) | [Video](#)

Conference Proceedings

Toward a Design Space for Mitigating Cognitive Bias in Vis

E. Wall, J. Stasko, and A. Endert

IEEE Information Visualization (VIS) Short Papers, 2019.

 [PDF](#) |  [Supplemental](#) |  [Talk](#) |  [Video FF](#)

A Markov Model of Users' Interactive Behavior in Scatterplots

E. Wall, A. Arcalgud, K. Gupta, and A. Jo

IEEE Information Visualization (VIS) Short Papers, 2019.

 [PDF](#) |  [Talk](#) |  [Video FF](#)

A Formative Study of Interactive Bias Metrics in Visual Analytics Using Anchoring Bias

E. Wall, L. Blaha, C. Paul, and A. Endert

Proceedings of the 17th IFIP TC 13 International Conference on Human-Computer Interaction (INTERACT'19), 2019.

 [PDF](#) |  [Video](#)

Using Expert Patterns in Assisted Interactive Machine Learning: A Study in Machine Teaching

E. Wall, S. Ghorashi, and G. Ramos

Proceedings of the 17th IFIP TC 13 International Conference on Human-Computer Interaction (INTERACT'19), 2019.

 [PDF](#) |  [Video](#)

Warning, Bias May Occur: A Proposed Approach to Detecting Cognitive Bias in Interactive Visual Analytics

E. Wall, L. Blaha, L. Franklin, and A. Endert

IEEE Visual Analytics Science and Technology (VAST), 2017.

 [PDF](#) |  [Talk](#) |  [Video](#) |  [Video FF](#)

Supporting Team-First Visual Analytics through Group Activity Representations

S.K. Badam, Z. Zeng, E. Wall, A. Endert, and N. Elmqvist

Graphics Interface, 2017.

 [PDF](#) |  [Video](#)

Workshop Papers

COVID-19 Health Equity Dashboard - Addressing Vulnerable Populations

S. Liu, E. Wall, S. Patel, and Y. Park

Visualization for Communication (VisComm, at VIS'20), 2020.

 [PDF](#)

Four Perspectives on Human Bias in Visual Analytics

E. Wall, L. Blaha, C. Paul, K. Cook, and A. Endert

DECISive: Workshop on Dealing with Cognitive Biases in Visualizations (at InfoVis'17), 2017.

 [PDF](#)

Book Chapters

Four Perspectives on Human Bias in Visual Analytics

E. Wall, L. Blaha, C. Paul, K. Cook, and A. Endert

Cognitive Biases in Visualizations, Ed. G. Ellis, Springer, 2018, Chapter 3, pp. 29-42.

 [Book](#) |  [Chapter](#)

Theses

Detecting and Mitigating Human Bias in Visual Analytics

Emily Wall

Georgia Tech, School of Interactive Computing Ph.D. Thesis. April 2020.

 [PDF](#)

Professional Experience

- 2015-2020 [Georgia Institute of Technology](#), Atlanta, GA
Graduate Research Assistant
Advised by [Dr. Alex Endert](#)
Thesis: Detecting and Mitigating Human Bias in Visual Analytics
- Summer 2018 [Microsoft Research](#), Redmond, WA
Intern, [Machine Teaching Group](#)
Mentored by [Dr. Gonzalo Ramos](#)
Modeled how experts use machine teaching to train ML classifiers. Developed systematic guidelines to help novices train ML classifiers.
- Summer 2016 [Pacific Northwest National Laboratory](#), Richland, WA
Intern, [Visual Analytics Group](#)
Mentored by [Lyndsey Franklin](#) and [Kris Cook](#)
Developed heuristics to characterize bias in real-time from user interaction sequences
- 2013-2015 [Jet Propulsion Laboratory](#), Pasadena, CA
Intern, Systems Engineering Group
Advised by [Marc Sarrel](#)
Used SysML and principles of Model-Based Systems Engineering to visualize network flows for Lockheed Martin's [Orion capsule](#)
- Fall 2014 [University of Georgia](#), Athens, GA
Undergraduate Research Assistant
Advised by [Dr. Don Potter](#)
Developed neural network to predict solar radiation in Georgia; funded by the Georgia Power Advanced Solar Initiative
- Fall 2013 [University of Georgia](#), Athens, GA
Undergraduate Research Assistant
Advised by [Dr. Liming Cai](#)
Used sequence alignment techniques to determine coevolution of species with a common ancestor
- Spring 2013 [University of Georgia](#), Athens, GA
Undergraduate Research Assistant
Advised by [Dr. Prashant Doshi](#)
Created simulation and programmable interface for Parrot A.R. Drone quadcopters to serve as a testbed for autonomous decision making with UAVs
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Grants & Funding

2019-2020	Toward Mitigating Cognitive Bias for Data-Driven Decision Making with Visual Analytics Siemens FutureMaker Fellowship Co-PIs: Dr. Alex Endert Funded: \$101,435
2019	Detecting and Mitigating Human Bias in Visual Analytics GVU Foley Scholar Co-PIs: Dr. Alex Endert Funded: \$5,000
2017-2020	Toward Mitigating Cognitive Bias for Data-Driven Decision-Making With Visual Analytics Graduate Fellowship for STEM Diversity (GFSD) Co-PIs: Dr. Alex Endert Funded: \$20,000 / year for 3 years
2014	Predicting Solar Radiation in Georgia CURO Research Assistantship Co-PIs: Dr. Don Potter Funded: \$1,000

Teaching

Instructor

Fall 2021	Information Visualization (CS 485 / 584) Emory University
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Teaching Assistant

Spring 2019	Introduction to Information Visualization (CS 4460) (133 students) Georgia Institute of Technology
Fall 2017	Information Visualization (CS 7450) (74 students) Georgia Institute of Technology
Fall 2013	Introduction to Computing and Programming (CSCI 1301) University of Georgia
Fall 2012	Introduction to Computing and Programming (CSCI 1301) University of Georgia

Guest Lecturer

Feb 2019	Introduction to Javascript Introduction to Information Visualization (CS 4460), Georgia Institute of Technology
Dec 2017	Cognition in Visualization Information Visualization (CS 7450), Georgia Institute of Technology
Nov 2017	Visual Analytics

Presentations

Invited Talks

As We Are: Detecting and Mitigating Human Bias in Visual Analytics

- > *April 2021*. University of Utah, Data Science Seminar. Virtual Seminar.
- > *October 2020*. Pacific Northwest National Laboratory. Virtual Brown Bag.
- > *September 2020*. Emory University. Atlanta, GA. [!\[\]\(d328bb1c8b293dce97ce8ae48fe06a23_img.jpg\) Abstract](#)
- > *May 2020*. CMU & AFRL, Center for Excellence on Human-Machine Teaming. Virtual Brown Bag.
- > *May 2020*. Siemens. Virtual Brown Bag.
- > *March 2020*. Cornell University, Info Science Colloquium. Ithaca, NY. [!\[\]\(de0615d88b2098828c20ab3d39ea2ef6_img.jpg\) Abstract](#)
- > *February 2020*. University of Washington, Allen School Colloquium. Seattle, WA. [!\[\]\(6c3f3105811ec6ad9c7c82c1ac88875f_img.jpg\) Watch](#)
- > *February 2020*. Emory University. Atlanta, GA. [!\[\]\(024fb6c2c3e2004cd99a0b34ebd984a9_img.jpg\) Abstract](#)
- > *February 2020*. New York University. New York, NY. [!\[\]\(a018cbc70ca4f8300f04774122af480d_img.jpg\) Abstract](#)
- > *February 2020*. University of Wisconsin. Madison, WI.

Left, Right, and Gender: Mitigating Implicit Human Bias in Visual Analytics

- > *January 2020*. Georgia Institute of Technology, Gvu Demo Showcase. Atlanta, GA. [!\[\]\(c33cb967c8fc4f5e27188a389b621c8e_img.jpg\) Watch](#)

The Interactive Analytics Library: Treating Interaction as Data

- > *May 2017*. Pacific Northwest National Laboratory. Richland, WA.
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Posters and Demonstrations

Warning, Bias May Occur: Detecting and Mitigating Cognitive Bias in Visual Analytics (Poster & Demo)

- > *October 2019*. Georgia Institute of Technology, Gvu Demo Showcase. Atlanta, GA.
- > *June 2019*. Summer Institute on Bounded Rationality. Berlin, Germany.
- > *April 2019*. Georgia Institute of Technology, Gvu Demo Showcase. Atlanta, GA.

Warning, Bias May Occur: A Proposed Approach to Detecting Cognitive Bias in Interactive Visual Analytics (Demo)

- > *April 2018*. CRA-W Grad Cohort. San Francisco, CA.
- > *April 2018*. Georgia Institute of Technology, Gvu Demo Showcase. Atlanta, GA.
- > *April 2017*. Georgia Institute of Technology, Gvu Demo Showcase. Atlanta, GA.

Podium: Ranking Data Using Mixed-Initiative Visual Analytics (Poster & Demo)

- > *April 2018*. Georgia Institute of Technology, Gvu Demo Showcase. Atlanta, GA.
 - > *April 2017*. Georgia Institute of Technology, Gvu Demo Showcase. Atlanta, GA.
 - > *April 2018*. CRA-W Grad Cohort. San Diego, CA.
 - > *April 2016*. Georgia Institute of Technology, Gvu Demo Showcase. Atlanta, GA.
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Mentoring

2020-2021

Jenni Hutson, B.A. Computer Science and Radio/TV/Film, Northwestern University,
Class of 2021

	Developed system for visualization recommendations that support decision making
2020	Star Liu , B.S. Quantitative Sciences, Emory University, Class of 2021 Developed system for visualizing health inequities during the COVID-19 pandemic, first author of case study on COVID-19 Health Equity Dashboard <i>Now: MS Health Sciences Informatics Student at Johns Hopkins</i>
2020	Jamal Paden , B.S. Computer Science, Georgia Institute of Technology, Class of 2020 Conducted usability testing for bias mitigation interventions, coauthor of Left, Right, and Gender
2017-2018	Yingxiao Ouyang , M.S. HCI, Georgia Institute of Technology, Class of 2019 Conducted usability testing and prototyping for bias mitigation interventions <i>Now: UX Designer at Walmart Labs</i>
2017	Qiaochu Mu , M.S. HCI, Georgia Institute of Technology, Class of 2018 Conducted usability testing and prototyping for bias mitigation interventions <i>Now: UX Designer at Alibaba Group</i>
2016-2017	Bharath Kalidindi , B.S. Computer Science, Georgia Institute of Technology, Class of 2018 Developed system for ranking data from user interaction, coauthored publication of Podium <i>Now: Software Engineer at Yahoo</i>

Service

Professional Service

2021	Organizing Committee Elections Chair, VIS 2021
>	Program Committee Member ACM CHI, 2022 IEEE VIS, 2021 Vis4Good Workshop at IEEE VIS, 2021 IEEE VIS Short Papers, 2020 VISxAI Workshop at IEEE VIS, 2019 CHI Late Breaking Work, 2018
2020-2021	Organizer TRust and EXpertise in Visual Analytics (TREX) Workshop at IEEE VIS 2021 TRust and EXpertise in Visual Analytics (TREX) Workshop at IEEE VIS 2020
2017	Panelist Advancing Visualization Inclusion and Diversity (AVID) Workshop at IEEE VIS
>	Reviewer IEEE VIS: 2017-2021 CHI: 2018-2021 TVCG: 2018-2021 EuroVis: 2020-2021 CG&A: 2021 CSCW: 2021 International Journal of Human-Computer Studies: 2019 KDD IDEA: 2017 VAST Challenge: 2016

Institutional Service

- 2021 **Faculty Search Committee**
Computer Science Department, Emory University
- 2021 **Graduate Admissions Committee**
Computer Science Department, Emory University
- 2018-2020 **Graduate Student Council Chair**
Representative of graduate students in the School of Interactive Computing, Georgia Tech
- 2017-2018 **Graduate Student Council Travel Committee**
Responsible for reviewing and awarding travel grants to graduate student applicants in the College of Computing, Georgia Tech
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Selected Media

- Nov 2019 **A Reflection on VIS2019: Or, How Doomed Are We?** Medium Blog Post, Multiple Views on Visualization Research Explained. [Read](#)
by Michael Correll
- Nov 2019 **Highlights from IEEE VIS 2019**, Uncharted Software Blog. [Read](#)
by Rosa Romero-Gómez
- May 2019 **Battling Bias**. Ep. 3, Tech Unbound Podcast. [Listen](#)
with Josh Preston
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Other Professional Activities

- Aug 2021 [Visualization Summer Camp](#)
Minneapolis, MN
- Oct 2019 [NextProf Nexus Workshop](#)
Atlanta, GA
- Jun 2019 [Summer Institute on Bounded Rationality](#)
Berlin, Germany
- Apr 2018 [CRA-W Grad Cohort Workshop](#)
San Francisco, CA
- Oct 2016 [Grace Hopper Celebration of Women in Computing](#)
Houston, TX
- Apr 2016 [CRA-W Grad Cohort Workshop](#)
San Diego, CA
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