







# Emily Wall

My research involves decision making using data visualization 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 will be joining the Department of Computer Science at Emory University as an Assistant Professor in Fall 2021. I am currently completing a Postdoc at Northwestern University with Jessica Hullman and Steve Franconeri (Summer 2020 - Summer 2021). I completed my Ph.D. in Computer Science at Georgia Tech in 2020.

 <a href="mailto:emily.wall@emory.edu">emily.wall@emory.edu</a>	 <a href="#">Google Scholar</a>
 <a href="https://github.com/emilywall">emilywall.github.io</a>	 <a href="#">LinkedIn</a>
 <a href="#">@embwall</a>	 <a href="#">PDF of CV</a>

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## Appointments

2021-	<b>Assistant Professor</b> <a href="#">Department of Computer Science</a> <a href="#">Emory University</a>
2020-2021	<b>Postdoctoral Researcher</b> <a href="#">Department of Computer Science</a> <a href="#">Northwestern University</a>

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## Education

2020	<b>Ph.D. in Computer Science</b> <a href="#">Georgia Institute of Technology</a> Thesis: Detecting and Mitigating Human Bias in Visual Analytics Committee: <a href="#">Alex Endert</a> , <a href="#">John Stasko</a> , <a href="#">Polo Chau</a> , <a href="#">Brian Fisher</a> , <a href="#">Wenwen Dou</a>
2015	<b>B.S. in Computer Science &amp; Mathematics</b> <a href="#">University of Georgia</a> <i>summa cum laude</i>

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## Honors & Awards

2020	<a href="#">VGTC Best Dissertation</a> , Honorable Mention
2019	<a href="#">GVU Foley Scholar</a> , Recipient, Georgia Institute of Technology
2019	<a href="#">D.E. Shaw Exploration Fellowship</a> , Recipient
2019	<a href="#">Siemens FutureMaker Fellowship</a> , Recipient

2018	<a href="#"><u>GVU Foley Scholar</u></a> , Finalist, Georgia Institute of Technology
2017	<a href="#"><u>Graduate Student Symposium</u></a> , Participant, AT&T Labs
2017	<a href="#"><u>Doctoral Colloquium</u></a> , Participant, IEEE VIS
2017-2020	<a href="#"><u>Graduate Fellowship for STEM Diversity (GFSD)</u></a> , Recipient
2017	<a href="#"><u>NSF Graduate Research Fellowship Program</u></a> , Honorable Mention
2017	<a href="#"><u>Department of Defense SMART Fellowship</u></a> , Recipient (Declined)
2015-2019	<a href="#"><u>President's Fellowship</u></a> , Recipient, Georgia Institute of Technology
2015	<a href="#"><u>CURO Symposium Best Paper Award</u></a> , University of Georgia
2014	<a href="#"><u>CURO Research Assistantship</u></a> , University of Georgia
2014	<a href="#"><u>Hahn Family Scholarship for Computer Science</u></a> , Recipient, University of Georgia
2013	<a href="#"><u>Hollingsworth Award for Excellence in Mathematics</u></a> , Recipient, University of Georgia
2012-2015	<a href="#"><u>Zell Miller Scholarship</u></a> , Recipient, University of Georgia

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## Publications

### Journal Articles

#### 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.

[!\[\]\(a870788d6ed9b8fd294b7654a8c8526b\_img.jpg\) PDF](#) | [!\[\]\(18065afa4ef6662bca9f3f6088f7de30\_img.jpg\) Talk](#) | [!\[\]\(b985170eefb48b9b3ef593e79310e8f5\_img.jpg\) Website](#) | [!\[\]\(65defa7fe6c24be84c2514c965593962\_img.jpg\) 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.

[!\[\]\(c50c8b7b2cc2cf9ff925edec0ee94c0d\_img.jpg\) PDF](#) | [!\[\]\(8bed43dc33ecdde61e2f76c8f5517125\_img.jpg\) Talk](#) | [!\[\]\(047f882704cdc566325d0a83645d692e\_img.jpg\) Video](#) | [!\[\]\(4f39bb1f5d124de68e2d5e309adc07d7\_img.jpg\) Video FF](#) | [!\[\]\(9956dc689101f4d2cd02413c5e727ccb\_img.jpg\) Demo](#)

#### AxiSketcher: 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.

[!\[\]\(f60b7a900783ac3fd531bfd9c111be6d\_img.jpg\) PDF](#) | [!\[\]\(fe5cf1978663f480c504f8fc2019fe62\_img.jpg\) Video](#)

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### 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.

[!\[\]\(166772600a13ad0a433053f90fe45649\_img.jpg\) PDF](#) | [!\[\]\(98e7c6b0160281a12fbadc337ff6b6c3\_img.jpg\) Supplemental](#) | [!\[\]\(1ba9b47b7fe5cef14198dd1f193307f3\_img.jpg\) Talk](#) | [!\[\]\(24aa5934ea13bd038851b1095544b8b7\_img.jpg\) 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.

[!\[\]\(a8ff699ced33317c53c86f9bf3171905\_img.jpg\) PDF](#) | [!\[\]\(7c08f656893b221194f2f1726f0b91e6\_img.jpg\) Talk](#) | [!\[\]\(e4c419dad7fb4b2eb7c1b5471321c3b4\_img.jpg\) 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. Elmquist

*Graphics Interface*, 2017.

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

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## 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](#)

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## 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](#)

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## Theses

### Detecting and Mitigating Human Bias in Visual Analytics

Emily Wall

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

 [PDF](#)

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## 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](#), Seattle, 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

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## Teaching

### 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

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### Guest Lectures

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**  
Information Visualization (CS 7450), Georgia Institute of Technology

Jun 2017 **Visualization Design: Do's and Don'ts**  
Introduction to Information Visualization (CS 4460), Georgia Institute of Technology

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## Presentations

### Invited Talks

**As We Are: Detecting and Mitigating Human Bias in Visual Analytics**  
> *October 2020*. Pacific Northwest National Laboratory. Virtual Brown Bag.

- > *September 2020*. Emory University. Atlanta, GA. [!\[\]\(2dc8cdc0c918df88cde61039ecf68682\_img.jpg\) 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. [!\[\]\(793119bf0d613bd9b598fb8668922511\_img.jpg\) Abstract](#)
- > *February 2020*. University of Washington, Allen School Colloquium. Seattle, WA. [!\[\]\(0a4819029e810ca9d2aba79260b63a4d\_img.jpg\) Watch](#)
- > *February 2020*. Emory University. Atlanta, GA. [!\[\]\(5b78a2fafd05db5e14d20573d68ef9b3\_img.jpg\) Abstract](#)
- > *February 2020*. New York University. New York, NY. [!\[\]\(25fe2c0d7244c22c84de6bda963b471d\_img.jpg\) 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 Brown Bag. Atlanta, GA. [!\[\]\(5ba1bc70d78f05c00988641e5e513c62\_img.jpg\) Watch](#)

### **The Interactive Analytics Library: Treating Interaction as Data**

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

## **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.

## **Mentoring**

2020-2021	<b>Jenni Hutson</b> , B.A. Computer Science and Radio/TV/Film, Northwestern University, Class of 2021 Developed system for visualization recommendations that support decision making
2020	<b>Star Liu</b> , B.S. Quantitative Sciences, Emory University, Class of 2021 Developed system for <a href="#">visualizing health inequities</a> during the COVID-19 pandemic, first author of case study on <a href="#">COVID-19 Health Equity Dashboard</a>
2020	<b>Jamal Paden</b> , B.S. Computer Science, Georgia Institute of Technology, Class of 2020 Conducted usability testing for bias mitigation interventions
2017-2018	<b>Yingxiao Ouyang</b> , 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	<b>Qiaochu Mu</b> , M.S. HCI, Georgia Institute of Technology, Class of 2018

Conducted usability testing and prototyping for bias mitigation interventions

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](#)  
*Now: Software Engineer at Yahoo*

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## Service

### Professional Service

- > **Program Committee Member**  
IEEE VIS Short Papers, 2020  
VISxAI Workshop at IEEE VIS, 2019  
CHI Late Breaking Work, 2018
- > **Reviewer**  
IEEE VIS: 2017-2020  
CHI: 2018-2020  
TVCG: 2018-2020  
EuroVis: 2020  
International Journal of Human-Computer Studies: 2019  
KDD IDEA: 2017  
VAST Challenge: 2016
- 2020 **Organizer**  
[TRust and EXpertise in Visual Analytics \(TREX\) Workshop at IEEE VIS](#)
- 2017 **Panelist**  
Advancing Visualization Inclusion and Diversity (AVID) Workshop at IEEE VIS

### Institutional Service

- 2018-2020 **Graduate Student Council Chair**, School of Interactive Computing  
Representative of graduate students in the School of Interactive Computing
  - 2017-2018 **Graduate Student Council Travel Committee**  
Responsible for reviewing and awarding travel grants to graduate student applicants in the College of Computing
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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

Oct 2019	<b>NextProf Nexus Workshop</b> Atlanta, GA
Jun 2019	<b>Summer Institute on Bounded Rationality</b> Berlin, Germany
Apr 2018	<b>CRA-W Grad Cohort Workshop</b> San Francisco, CA
Oct 2016	<b>Grace Hopper Celebration of Women in Computing</b> Houston, TX
Apr 2016	<b>CRA-W Grad Cohort Workshop</b> San Diego, CA

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