Danielle Albers Szafir

University of Colorado Boulder

315 UCB
Department of Information Science
University of Colorado
Boulder, CO 80309

Homepage: http://www.daniellesz afir.com

☎ *303.492.8532*
✉ *danielle.szafir@colorado.edu*

Research Statement

My research bridges data visualization and perception to drive the design of novel systems for analyzing large and complex datasets. I focus on expanding our knowledge of perception in order to evaluate how visualization design impacts users' abilities to accomplish their analytical goals. Through this process, I derive quantified insight into the role of perception in interpreting visualizations by gauging how real viewers in natural environments perceive encoded information. I use this knowledge to design systems and techniques that overcome scalability and interpretability limitations in existing designs. The resulting visualizations address research problems across a variety of domains, including genomics, proteomics, biochemistry, and the humanities.

Research Interests

Information Visualization, Computer Graphics, Perceptual Science, Bioinformatics, Human-Computer Interaction, Color Science, Computer Vision, Machine Learning and Data Mining, and Graphic Design.

Research Experience

2015–Present **Assistant Professor**, *Department of Information Science*, University of Colorado Boulder.
Founding faculty member of the Department of Information Sciences in the College of Media, Communication, and Information.
Affliate appointment: Department of Computer Science.

2010–2015 **Research Assistant**, *Department of Computer Sciences*, University of Wisconsin-Madison.

2013 **Research Intern**, *Tableau Software*, Menlo Park, CA.

2012 **Software Development Intern**, *Google*, Madison, WI.

2009 **Software Development Intern**, *Boston Scientific, CRM*, Redmond, WA.

2008–2009 **Software Development Intern**, *Apptio*, Bellevue, WA.

Education

2009–2015 **Ph.D. in Computer Sciences**, *University of Wisconsin-Madison*.
Dissertation: "Improving Color for Data Visualization."
Thesis Committee: Michael Gleicher, Steven Franconeri, Bilge Mutlu, Robert Roth, & Kevin Ponto.
Minor studies in perceptual psychology and art history.

2009–2011 **Master of Science in Computer Sciences**, *University of Wisconsin-Madison*.

2007–2009 **Bachelor of Science in Computer Science**, *University of Washington*.
NASA Space Grant Scholar, four-time Dean's List Member, graduated at age 20.
Minor in mathematics.

Honors & Awards

2014 **MERL Best Student Paper Award**, *IS&T 22nd Color and Imaging Conference for "Adapting Color Difference for Design"*.

2014 **Invited Participant**, *Genres of Scholarly Knowledge Production 2014*.

2014 **Honorable Mention for Best Presentation**, *McPherson Eye Research Institute Symposium*.

2014 **Andrew W. Mellon Workshop Grant**, *Digital Humanities Research Network*.

2013 **Best SciVis Poster Award**, *IEEE VIS for "Lightness Constancy in Surface Visualization"*.

2013 **Invited Participant**, *IEEE VIS Doctoral Colloquium*.

2010–2012 **Research Fellow**, *BACTER Institute, University of Wisconsin-Madison*.

2007–2009 **NASA Space Grant Scholar**, *NASA Space Grant, University of Washington Chapter*.

2007–2009 **Dean's List Member**, *University of Washington*.

Publications

Journal Publications

Danielle Albers Szafir, Steve Haroz, Michael Gleicher, and Steven Franconeri. "Four Types of Ensemble Encoding for Data Visualizations." *Journal of Vision*, 2015 (in revision).

Danielle Albers Szafir, Alper Sarikaya, and Michael Gleicher. "Lightness Constancy in Surface Visualization." *Transactions on Visualization and Computer Graphics*, 2015 (in revision).

Alper Sarikaya, **Danielle Albers**, Julie Mitchell, and Michael Gleicher. "Visualizing Validation of Protein Surface Classifiers." *Computer Graphics Forum*, 33(3), 2014. In the Proceedings of the Eurographics Conference on Visualization.

Danielle Albers, Colin Dewey, and Michael Gleicher. "Sequence Surveyor: Leveraging Overview for Scalable Genomic Alignment Visualization." *IEEE Transactions of Visualization and Computer Graphics*, 17(5), 2011. In the Proceedings of the IEEE Information Visualization Conference.

Michael Gleicher, **Danielle Albers**, Rick Walker, Ilir Jusufi, Charles Hansen, and Jonathan Roberts. "Visual Comparison for Information Visualization." *Information Visualization*, 10(4), 2011.

Refereed Conference Publications

Danielle Albers Szafir, Maureen Stone, and Michael Gleicher. "Adapting Color Difference for Design." *IS&T 22nd Color and Imaging Conference*, 2014. **[Best Paper Award]**

Maureen Stone, **Danielle Albers Szafir**, and Vidya Setlur. "An Engineering Model for Color Discriminability as a Function of Size." *IS&T 22nd Color and Imaging Conference*, 2014.

Danielle Albers, Michael Correll, and Michael Gleicher. "Task-Driven Evaluation of Aggregation in Time Series Visualization." *Proceedings of the 2014 Annual Conference on Human Factors in Computing Systems (CHI)*, 2014.

Michael Correll, **Danielle Albers**, Steve Franconeri, and Michael Gleicher. "Comparing Averages in Time Series Data." *Proceedings of the 2012 Annual Conference on Human Factors in Computing Systems (CHI)*, 2012.

Refereed Abstracts

Danielle Albers, Michael Correll, Michael Gleicher, and Steve Franconeri. "Ensemble Processing of Color and Shape: Beyond Mean Judgments." *Journal of Vision*, 14(9), 2014.

Danielle Albers, Alper Sarikaya, and Michael Gleicher. "Lightness Constancy in Surface Visualization." *Poster Abstracts of IEEE VIS*, 2013. **[Best Poster Award]**

Alper Sarikaya, **Danielle Albers**, and Michael Gleicher. "Understanding Performance of Protein Structural Classifiers." *Poster Abstracts of IEEE VIS*, 2013.

Danielle Albers, Colin Dewey, and Michael Gleicher. "Sequence Surveyor: Leveraging Overview for Large-Scale Genomic Alignment Visualization." *Proceedings of VizBi 2011: Visualizing Biological Data*, 2011.

Danielle Albers and Michael Gleicher. "Poster: Perceptual Principles for Scalable Sequence Alignment Visualization." *2010 IEEE Information Visualization Poster Proceedings*, 2010.

Danielle Albers and Michael Gleicher. "Perceptual Principles for Scalable Sequence Alignment Visualization." *Proceedings of the 7th Symposium on Applied Perception in Graphics and Visualization*, 2010.

Invited Talks

Danielle Albers Szafir. "Perceptually-Driven Visualization of Complex Data." Rochester Institute of Technology, Rochester, New York, 2015.

Danielle Albers Szafir. "Perceptually-Driven Visualization of Complex Data." *Digital Arts Colloquium*, University of Iowa, Iowa City, Iowa, 2015.

Danielle Albers Szafir. "Perceptually-Driven Visualization of Complex Data." *Data @ ASU*, Arizona State University, Tempe, Arizona, 2015.

Danielle Albers Szafir. "Perceptually-Driven Visualization of Complex Data." *Information Science Seminar*, University of Colorado Boulder, Boulder, Colorado, 2015.

Danielle Albers Szafir. "Informing Visualization in the Humanities through Perception and Genomics." *Genres of Scholarly Knowledge Production*, Umeå University, Umeå, Sweden, 2014.

Workshops & Colloquia

Eric Alexander and **Danielle Albers Szafir**. "D3.js: Javascript for Data Visualization." *Second Annual Digital Humanities+Art Symposium: Going Public.* 2015.

Michael Correll, Eric Alexander, **Danielle Albers Szafir**, Alper Sarikaya, and Michael Gleicher. "Navigating Reductionism and Holism in Evaluation." *BELIV '14: Beyond Time and Errors—Novel Evaluation Methods for Visualization*, 2014.

Danielle Albers Szafir. "Thinking with Data." *Digital Humanities Research Network*, 2014.

Danielle Albers. "Perceptually Informed Scalable Sequence Comparison." *IEEE VIS Doctoral Colloquium*, 2013.

Danielle Albers and Michael Gleicher. "Seeing Double: Crowdsourced Models of Color Discrimination." *Midgraph: Midwest Graphics Workshop*, 2012.

Campus Talks

Danielle Albers Szafir. "Perceptually-Driven Information Visualization." *HCC Seminar*, University of Colorado Boulder, 2015.

Danielle Albers Szafir. "Insights at a Glance: Visualization at UW-Madison." *MERI at a Glance*, McPherson Eye Research Institute, Madison, Wisconsin, 2014.

Grants & Fellowships

Andrew W. Mellon Workshop Grant. "Digital Humanities Research Network," 2014.

BACTER Research Fellowship. Department of Energy's Institute for Bringing Computational Techniques to Energy Research (BACTER Institute) at the University of Wisconsin-Madison, 2010-2012.

Teaching

2009 **Teaching Assistant**, *Human-Computer Interaction*, University of Wisconsin-Madison.
Assisted students with concepts from the first graduate-level human-computer interaction course offered by the University.

2009 **Laboratory Instructor**, *Introduction to Programming*, University of Wisconsin-Madison.
Supervised four semester-long hands-on programming sessions and worked one-on-one with students in an introductory programming course (mean instructor rating: 4.58/5.00).

2008–2009 **Mathematics and English Instructor**, *Kumon of Redmond*, Redmond, WA.
Instructed K-12 and adult students in concepts from mathematics and English, working with small groups of students progressing through individualized curricula.

Undergraduate Research Mentorship

2015 **Yusef Suhail**, *Web-based N-Grams Visualization with TextDNA*

2014 **Andrew Hermus**, *Scalable Visualization for Text Analytics* (w. Eric Alexander)

2013 **Benjamin Reddersen**, *Rendering Techniques for Molecular Surface Visualization*

Professional Activities & Service

Outreach

2010–Present **ACM-W Mentor**, *Department of Computer Sciences, University of Wisconsin-Madison*.
Mentored 15 undergraduate women in computer sciences with interests in computer graphics and visualization.

2009 **Majors Fair Representative**, *Department of Computer Sciences, University of Wisconsin-Madison*.
Provided information about computer science and gave demos of current undergraduate research projects to incoming freshmen.

2009 **Department Guide**, *Department of Computer Sciences, University of Washington*.
Guided elementary school students through a series of hands-on activities and presentations from computer science researchers.

Service

2015 **Information Science Curriculum Committee**, *University of Colorado Boulder*.

2015 **Information Science Faculty Search Committee**, *University of Colorado Boulder*.

2015 **Computer Science Graduate Program Committee**, *University of Colorado Boulder*.

2014–2015 **Digital Humanities Research Network Founding Member & Coordinator**, *University of Wisconsin-Madison*.

2012–2015 **Visualization Reading Group Founder & Coordinator**, *University of Wisconsin-Madison*.

2015 **Organizing Committee Member**, *University of Wisconsin-Madison Digital Humanities+Art Symposium*.

2014–2015 **Program Committee Member**, *BioVis: Symposium on Biological Data Visualization*.

2015 **Reviewer**, *Transactions on Cartography and Geographic Information Science*.

2013–2015 **Reviewer**, *IEEE Information Visualization*.

2015 **Reviewer**, *IEEE Visual Analytics Science and Technology (VAST)*.

2014 **Reviewer**, *BMC Medical Informatics and Decision Making*.

2013 **Reviewer**, *BioVis: Symposium on Biological Data Visualization*.

Professional & Academic Memberships

2010–Present ACM Member

2014–2015 IS&T Student Member

2012–2015 WHCI+D Member

2010–2015 IEEE Student Member

2008–Present Sigma Alpha Lambda Honor Society Member

2008–Present Phi Theta Kappa International Honor Society Member

Volunteer Positions

2009–2014 **Web Manager**, *University of Wisconsin-Madison Women's Hockey Club*.

2011–2012 **Assistant Practice Coach**, *Wisconsin Timberwolves Special Needs Hockey Team*.

2010 **GRE Tutor**, *University of Wisconsin-Madison*.

2007–2008 **Ice Hockey Officiating Mentor**, *Cascade Hockey Officiating Association*.

Professional References

Michael Gleicher, Professor
Department of Computer Sciences
University of Wisconsin-Madison
1210 W. Dayton Street
Madison, WI 53706
gleicher@cs.wisc.edu

Steven Franconeri, Associate Professor
Department of Psychology
Northwestern University
Swift Hall 102, 2029 Sheridan Road
Evanston, IL 60208
franconeri@northwestern.edu

Maureen Stone, Research Scientist
Tableau Software
837 N. 34th Street, Suite 200
Seattle, WA 98103
mstone@tableausoftware.com

Kevin Ponto, Assistant Professor
Design Studies Department
University of Wisconsin-Madison
330 N. Orchard Street
Madison, WI 53715
kbponto@wisc.edu