Danielle Albers Szafir

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Research Statement

My goal is to develop an understanding of visual perception in real-world contexts to drive the design of displays for visual exploration and communication. I focus on developing visualization techniques to support graphical comparisons of large and complex datasets with a special emphasis on enhancing the scalability and interpretability of visual displays across a variety of domains.

Research Interests

Data Visualization
Perceptual Science
Color Science
Computer Graphics and Vision
Human-Computer Interaction
Machine Learning and Data Mining

Education

2009 – 2015 (Projected) **PhD in Computer Science**, University of Wisconsin-Madison.
Dissertation: "Perceptually Informed Scalable Sequence Comparison."
Thesis Committee: Michael Gleicher (*advisor*), Steven Franconeri, Bilge Mutlu, and Kevin Ponto.
Minor studies in Perceptual Psychology and Art History.
GPA: 3.82/4.00.

2009 – 2011 **Masters of Science in Computer Science**, University of Wisconsin-Madison.
GPA: 3.77/4.00.

2007 – 2009 **Bachelors of Science in Computer Science**, University of Washington.
NASA Space Grant Scholar and four-time Dean's List Member.
Graduated with a Bachelors of Science at age 20.
Minor in Mathematics.
GPA: 3.60/4.00.

Publications

Refereed Full Publications

Danielle Albers Szafir, Maureen Stone, and Michael Gleicher. "Adapting Color Difference for Design." *Color and Imaging Conference, 2014*, November 2014 (to appear).

Maureen Stone, **Danielle Albers Szafir**, and Vidya Setlur. "An Engineering Model for Color Discriminability as a Function of Size." *Color and Imaging Conference, 2014*, November 2014 (to appear).

Alper Sarikaya, **Danielle Albers**, Julie Mitchell, and Michael Gleicher. "Visualizing Validation of Protein Surface Classifiers." *Computer Graphics Forum*, 33(3), June 2014. In Proceedings of Eurographics Conference on Visualization (EuroVis, Acceptance Rate: 25%).

Danielle Albers, Michael Correll, and Michael Gleicher. "Task-Driven Evaluation of Aggregation in Time Series Visualization." *CHI '14: Proceedings of the 2014 Annual Conference on Human Factors in Computing Systems*, May 2014. (Acceptance Rate: 23%).

Michael Correll, **Danielle Albers**, Steve Franconeri, and Michael Gleicher. "Comparing Averages in Time Series Data." *CHI '12: Proceedings of the 2012 Annual Conference on Human Factors in Computing Systems*, September 2012. (Acceptance Rate: 23%).

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), October 2011. In Proceedings of IEEE Information Visualization Conference (Acceptance Rate: 26%).

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

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), August 2014.

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

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

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

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

Invited Talks

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

Doctoral Colloquia

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

Workshops

Michael Correll, Eric Alexander, **Danielle Albers Szafir**, Alper Sarikaya, and Michael Gleicher. "Navigating Reductionism and Holism in Evaluation." *BELIV Workshop '14*, November 2014 (to appear).

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

Grants and Fellowships

Andrew W. Mellon Workshop Grant. Co-coordinator for the "Digital Humanities Research Network" grant, 2014.

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

Experience

Academic Experience

2010 – Present **Graduate Researcher**, Department of Computer Sciences, University of Wisconsin-Madison.
Conducting research on visualization with applications in computational biology, the humanities, and vision science under Professor Michael Gleicher.

Research focuses include designing perceptually-motivated scalable visualization techniques for scientific analysis and characterizing visual comparisons over complex datasets.

Collaborating with researchers across multiple countries and disciplines to discover and apply novel findings integrating perception, visualization, and domain science.

Spring 2012 **Guest Lecturer**, Visualization, University of Wisconsin-Madison.
Lectured on perceptually-motivated visualization design for the graduate-level visualization course.

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

Helped grade assignments and assisted with general course administration.

Autumn 2009 **Laboratory Instructor**, Introduction to Programming, University of Wisconsin-Madison.
Supervised semester-long hands-on programming sessions for an introductory programming course.

Worked one-on-one with students to enforce course concepts in weekly consulting hours.

Industry Experience

Autumn 2013 **Research Intern**, Tableau Software, Menlo Park, CA.
Worked with Vidya Setlur and Maureen Stone investigating multiple aspects of color in visualization.

Investigated interactions of color, task, and data in existing visualization approaches.

Conducted a series of internal and external experiments gauging perceptual effects of color appearance as pertains to information visualization contexts.

Summer 2012 **Software Development Intern**, Google, Madison, WI.
Designed and implemented a novel web-based bioinformatics data storage and analytics platform prototype leveraging cutting-edge cloud technologies.

Worked with developers at several domestic and international offices to interface multiple computational and storage platforms.

Developed a working knowledge of web development best practices and MapReduce-based analysis techniques to help handle data at massive scales.

Summer 2009 **Software Development Intern**, Boston Scientific, CRM, Redmond, WA.
Designed an application to derive automated testing suites from XML requirement files for complete parameter-based testing of Class 3 medical devices.

Worked in an Agile development environment to implement the above tool in Python.

Communicated with employees at off-site locations in order to design a thorough and complete testing paradigm capable of delivering quality output content and structure.

2008 – 2009 **Software Development Intern**, Apptio, Bellevue, WA.
Served as an intern for a leading software-as-a-service company founded by one of Seattle's most successful serial entrepreneurs.

Analyzed software for debugging and development using Java and GWT for product development.

Other Experience

2008 – 2009 **Mathematics and English Instructional Assistant**, Kumon of Redmond, Redmond, WA
2008 – 2009 **Ice Hockey Official**, Puget Sound Hockey Officials Association, Seattle, WA
2005 – 2009 **Ice Hockey Official**, Cascade Hockey Officiating Association, Seattle, WA

Outreach

2012 – Present **Visualization Reading Group Coordinator**, University of Wisconsin-Madison, Madison, WI.
2010 – Present **WACM Mentor**, Department of Computer Sciences, University of Wisconsin-Madison, Madison, WI.
2009 **Majors Fair Representative**, Department of Computer Sciences, University of Wisconsin-Madison, Madison, WI.

Undergraduate Research Mentorship

2014 Andrew Hermus
2013 Benjamin Reddersen

Service

2014 **Program Committee Member**, BioVis: Symposium on Biological Data Visualization
2014 **Reviewer**, IEEE Information Visualization
2014 **Reviewer**, BMC Medical Informatics and Decision Making
2013 **Reviewer**, IEEE Information Visualization
2013 **Reviewer**, BioVis: Symposium on Biological Data Visualization

Volunteer Positions

2009 – 2014 **Web Manager**, University of Wisconsin-Madison Women's Hockey Club, Madison, WI.
2011 – 2012 **Assistant Practice Coach**, Wisconsin Timberwolves Special Needs Hockey Team, Madison, WI.
2010 **GRE Tutor**, University of Wisconsin-Madison, Madison, WI.
2009 **Department Guide**, Department of Computer Sciences, University of Washington, Seattle, WA.
2007 – 2008 **Ice Hockey Officiating Mentor**, Cascade Hockey Officiating Association, Seattle, WA.

Computing Languages

Programming: JavaScript, Java, Python, C#, C++, C, SQL, ActionScript, XML, HTML, PHP, Ruby, Haskell, Scheme
Scientific: JMP, Matlab, R

Professional and Academic Memberships

ACM Student Member
IEEE Student Member
Sigma Alpha Lambda Honor Society Member
Phi Theta Kappa International Honor Society Member

Honors and Awards

2014 **Honorable Mention**, McPherson Eye Research Institute Best Student Presentation
2013 **Best SciVis Poster Award**, IEEE VIS
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