



Matthew Brehmer

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Data Visualization Researcher

PhD, MSc, BComp

Seattle, Washington

mattbrehmer.github.io

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@mattbrehmer

Education

University of British Columbia

Doctor of Philosophy (Computer Science)

Dissertation: *Why Visualization? Task Abstraction for Analysis and Design*

Supervisory committee: Tamara Munzner (chair), Joanna McGrenere, & Ron Rensink

Vancouver, Canada

2011 – 2016

Master of Science (Computer Science, Sub-Specialization in Human Computer Interaction)

Supervised by Joanna McGrenere & Claudia Jacova

2009 – 2011

Queen's University

Bachelor of Computing (Honours) with Distinction

Specialization in Cognitive Science with Professional Internship

Kingston, Canada

2004 – 2009

Skills

Visualization & Interface Design

I design visualization tools and techniques for data analysis and communication: I write code, I sketch, and I explore and transform data.

Experiment Design & Analysis

I conduct controlled experiments as a way to understand human capabilities with respect to perception and attention (and sometimes these results have actionable implications for human-computer interface design).

Qualitative User Research

I evaluate current data analysis and communication processes, work-in-progress designs, and deployed visualization tools: I conduct work domain analyses, interview studies, chauffeured demos/walkthroughs, and field studies.

Domains

Journalism

As part of an ongoing collaboration between the UBC InfoVis Group and the Associated Press / Knight Foundation Overview Project, I conducted six case studies of journalists who used Overview to investigate and report on large text document collections. Our findings led to generalizable lessons for visualization design. I am also interested in providing journalists with better tools for producing presenting information to readers; and specifically tools for producing visual timelines.

Energy

I have collaborated with a company that develops enterprise energy analysis and reporting software and designed visualizations for analyzing and monitoring energy usage in large portfolios of buildings. I consulted with various stakeholders and prospective users, envisioning ways to interactively locate patterns and anomalies.

Health & Fitness

My M.Sc research pertained to the design and evaluation of C-TOC, a computerized cognitive assessment tool intended for early detection of dementia. I studied the use of C-TOC prototypes by healthy older adults and by adults with diagnosed mild cognitive impairments.

Prior to my M.Sc, I worked in the area of exercise video games (aka active games): I studied the role of physical exertion on cognitive task performance. I also designed GAIM, an XNA/C# toolkit which allowed players with different input peripherals to play active games together.



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Work Experience

Microsoft Research

Research Intern

I conducted research related to information visualization and human-computer interaction, working with the neXus research team and advised by Bongshin Lee.

Redmond, USA

Summer 2015

EnerNOC (formerly Pulse Energy)

Mitacs-Accelerate Graduate Research Intern

I designed visualization prototypes for commercial energy analysis and management software. I consulted with prospective users and other stakeholders, envisioning ways to interactively locate patterns and anomalies in large hierarchical spatio-temporal datasets.

Vancouver, Canada

2013 – 2014

University of British Columbia Department of Computer Science

Research Assistant

I designed and conducted human-computer interaction experiments, collected qualitative data regarding software usability and utility from interview and field studies, performed data analysis in tools such as R and SPSS, and wrote research papers.

Vancouver, Canada

2009 – 2016

Engineering Interactive Systems at Queen's University (EQUIS)

Research Assistant

I designed and conducted an experiment to investigate the role of physical exertion on cognitive task performance. I also designed GAIM, an XNA/C# toolkit which allowed players with different input peripherals to play active games together.

Kingston, Canada

2008 – 2009

EMC Corporation

User Experience Design Intern

I designed the user interface for enterprise rich media content management software, intended for use by the design and marketing departments at a large automotive company. I consulted with stakeholders, developed mockups, and wrote UI code.

Toronto, Canada

2007 – 2008

Killam Properties, Inc.

Web Developer, IT Support Staff

I maintained the website for a Canadian residential property management company.

Halifax, Canada

Summer 2006

Teaching

University of British Columbia Department of Computer Science

Teaching Assistant

I planned and conducted tutorials for up to three dozen senior undergraduate students in a course in advanced human-computer interaction methods, and in an introductory course in human computer interaction.

Vancouver, Canada

2009 – 2010

Volunteering

External Reviewer: IEEE InfoVis, VAST, & TVCG, EuroVis, ACM TOCHI, CHI, & SIGGRAPH Asia

2013 – 2016

Student Volunteer: ACM CHI Conference

2011, 2013, 2015, 2016

University of British Columbia Department of Computer Science

Graduate Admissions and Recruitment Committee

Vancouver, Canada

2013 – 2015

University of British Columbia Computer Science Graduate Students' Association

Vice President (Social Events)

Graduate Student Orientation Committee

Un-Distinguished Lecture Series Organizer

Vancouver, Canada

2010 – 2011

2012

2010 – 2011, 2012 – 2013

Awards & Honours

Invited to the 2014 IEEE VIS Doctoral Colloquium, Mitacs-Accelerate Graduate Research Internship Program Award, UBC CS Student Service & Volunteering Awards, NSERC Postgraduate Scholarship, UBC Four Year Doctoral Fellowship, UBC CS Merit Scholarship, Queen's Entrance Scholarship



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Research Publications

* papers accepted

Timelines Revisited: A Design Space and Considerations for Expressive Storytelling.

2017

Brehmer, Lee, Bach, Henry Riche, & Munzner. To appear in *IEEE Trans. Visualization & Computer Graphics* (TVCG).

Matches, Mismatches, and Methods: Multiple-View Workflows for Energy Portfolio Analysis.

2016

Brehmer, Ng, Tate, & Munzner. In *IEEE Trans. Visualization & Computer Graphics / Proc. InfoVis 2015*, 22(1). p. 449-458.

39 / 178*

(22%)

TimeLineCurator: Interactive Authoring of Visual Timelines from Unstructured Text.

2016

Fulda, **Brehmer**, & Munzner. *IEEE Trans. Visualization & Computer Graphics / Proc. Visual Analytics Science & Technology (VAST 2015)*, 22(1). p.300-309.

31 / 149*

(21%)

Overview: The Design, Adoption, and Analysis of a Visual Document Mining Tool For Investigative Journalists.

2014

Brehmer, Ingram, Stray, & Munzner. *IEEE Trans. Visualization & Computer Graphics / Proc. InfoVis*, 20(12). p. 2271-2280.

45 / 196*

(23%)

Visualizing Dimensionally-Reduced Data: Interviews with Analysts and a Characterization of Task Sequences.

2014

Brehmer, Sedlmaier, Ingram, & Munzner. *Proc. ACM Workshop on BEyond time and errors: novel evaLuation methods for Information Visualization (BELIV)*. p.1-8.

23 / 30*

(77%)

Pre-Design Empiricism for Information Visualization: Scenarios, Methods, and Challenges.

2014

Brehmer, Carpendale, Lee, & Tory. *Proc. ACM Workshop on BEyond time and errors: novel evaLuation methods for Information Visualization (BELIV)*. p.147-151.

23 / 30*

(77%)

C-TOC (Cognitive Testing on Computer): Investigating the Usability and Validity of a Novel Self-administered Cognitive Assessment Tool in Aging and Early Dementia. Jacova, McGrenere, Lee, Wang, Le Huray, Corenblith,

2014

Brehmer, Tang, Hayden, Beattie, & Hsiung. *Alzheimer and Related Disorders*.

23 / 30*

(77%)

A Multi-Level Typology of Abstract Visualization Tasks.

2013

Brehmer & Munzner. *IEEE Trans. Visualization & Computer Graphics / Proc. InfoVis*, 19(12), p. 2376–2385.

38 / 152*

(25%)

Investigating Interruptions in the Context of Computerised Cognitive Testing for Older Adults

2012

Brehmer, McGrenere, Tang, & Jacova. *Proc. ACM Conf. Human Factors in Computing Systems (CHI)*, p.2649-2658.

370 / 1577*

(23%)

The Haptic Crayola Effect: Exploring the Role of Naming in Learning Haptic Stimuli.

2011

Hwang, Maclean, **Brehmer**, Hendy, Sotirakopoulos, & Choi. *Proc. IEEE World Haptics Conference*, p. 385-390.

Activate Your GAIM: A Toolkit for Input in Active Games.

2010

Brehmer, Graham, & Stach. *Proc. ACM Academic Conference on the Future of Game Design and Technology (Future Play)*, p. 151-158.

Classifying Input for Active Games.

2009

Stach, Graham, **Brehmer**, & Hollatz. *Proc. ACM Advances in Computer Entertainment (ACE)*, p. 379-382.

Programming

R, JavaScript (D3.js), HTML, CSS, ActionScript / Flex, Processing, Java, C#, C, Matlab

Software Tools

OmniGraffle, Visio, Photoshop, SPSS, Tableau Desktop, Weka, Fusion Tables, ScraperWiki, InqScribe, Dedoose, Git, SVN, LaTeX, iWork, Office, GarageBand, Logic Pro