MATTHEW BREHMER, PHD

INFORMATION VISUALIZATION RESEARCHER

✉ mattbrehmer@**gmail**

👤 mattbrehmer.github.io

⊞ **aka.ms**/mabrehme

🐦 **twitter**/mattbrehmer

💼 **linkedin**/matthewbrehmer

🐙 **github**/mattbrehmer

▦ **bl.ocks**/mattbrehmer

I am a **postdoctoral researcher at Microsoft Research** in Redmond, Washington, where I specialize in information visualization for storytelling and journalism. I am a member of the EPIC Research Group, HCI@MSR, Project Steller, and the Microsoft Data Journalism Team.

EXPERTISE

VISUALIZATION AND INTERFACE DESIGN

I design, develop, and deploy visualization tools and techniques for data analysis and communication.

➡ EXAMPLES PROJECTS: Timeline Storyteller, Portfolio Sandbox, SoundConsensus, ShinyFork

➡ RELATED PUBLICATIONS: J6, J5, T3

QUANTITATIVE HUMAN FACTORS RESEARCH

I conduct controlled experiments as a way to understand human capabilities with respect to perception and attention with the objective of deriving actionable implications for interface design.

➡ RELATED PUBLICATIONS: C4, T2, C3, T1

QUALITATIVE HUMAN FACTORS RESEARCH

I evaluate current data analysis and communication processes, work-in-progress designs, and deployed visualization tools by means of work domain analyses, interviews, chauffeured walkthroughs, and field studies.

➡ RELATED PUBLICATIONS: J5, J2, W3, W2, TR1, T2

APPLICATION DOMAINS

DATA JOURNALISM AND STORYTELLING

I aim to provide journalists and storytellers with usable and expressive tools for presenting information visually to their audience, such as with tools like Timeline Storyteller, TimeLineCurator, and ChartAccent.

➡ RELATED PUBLICATIONS: J4, J6

As part of my PhD, I conducted case studies of journalists who used *Overview* to investigate and report on large text document collections. Our findings provided transferible lessons for visualizing analyzing document collections and hierarchical data.

➡ RELATED PUBLICATION: J2

ENERGY MANAGEMENT AND CONSERVATION

As part of my PhD, I designed and developed visualization prototypes for analyzing and monitoring energy usage in portfolios of commercial buildings. I consulted with various stakeholders and prospective users, envisioning and implementing designs for interactively locating patterns and anomalies.

HEALTH AND FITNESS

My MSc 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.

→ RELATED PUBLICATIONS: C4, J3, T2, W1

Prior to my MSc, 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 developed *GAIM*, an XNA/C# toolkit which allowed players with different input peripherals to play active games together.

→ RELATED PUBLICATIONS: C2, C1, T1

EDUCATION

DOCTOR OF PHILOSOPHY   2011 - 2016

PhD in Computer Science
University of British Columbia (UBC), Vancouver, Canada
→ THESIS: *Why Visualization? Task Abstraction for Analysis and Design*
→ SUPERVISORY COMMITTEE: Tamara Munzner (UBC Computer Science), Joanna McGrenere (UBC Computer Science), and Ronald A. Rensink (UBC Psychology)
→ EXAMINATION COMMITTEE: Jason Dykes (giCentre, City University London), Alfred Hermida (UBC Journalism), and Giuseppe Carenini (UBC Computer Science)
→ RELATED PUBLICATIONS: T3, J1, J2, J5, TR1, W2

MASTER OF SCIENCE   2009 - 2011

MSc in Computer Science, specialization in Human-Computer Interaction
University of British Columbia (UBC), Vancouver, Canada
→ THESIS: *Usability and the Effects of Interruption in C-TOC: Self-Administered Cognitive Testing on a Computer*
→ SUPERVISED BY: Joanna McGrenere (UBC Computer Science) and Claudia Jacova (UBC Medicine)
→ RELATED PUBLICATIONS: C4, J3, W1, T2

BACHELOR OF COMPUTING   2004 - 2009

BComp, specialization in Cognitive Science with Professional Internship
Queen's University, Kingston, Canada
→ THESIS: *Assessing the Effect of Exercise Intensity on Cognitive Task Performance in an Exercise Video Game*
→ RELATED PUBLICATION: T1

EMPLOYMENT HISTORY

Microsoft Research EPIC Group   2016 - Present
Postdoctoral Researcher
Redmond, USA

University of British Columbia Department of Computer Science   2009 - 2016
Graduate Research Assistant
Vancouver, Canada

Microsoft Research Nexus Group   2015
Graduate Research Intern
Redmond, USA

Pulse Energy (now a division of EnerNOC)   2013 - 2014
Mitacs Research Intern
Vancouver, Canada

University of British Columbia Department of Computer Science   2009 - 2011
Graduate Teaching Assistant
Vancouver, Canada

Queen's University School of Computing   2009
Research Assitant
Kingston, Canada

EMC Corporation (now Dell EMC)   2007 - 2008
User Interface Design Intern
Toronto, Canada

Killam Properties, Inc.   2006
Information Technology Staff and Web Developer
Halifax, Canada

TALKS

Slides and videos from these talks are available at mattbrehmer.github.io/#talks

Timelines Revisited: A Design Space and Considerations for Expressive   2017-10-03
Storytelling
IEEE InfoVis 2017 (Phoenix, USA)
→ RELATED PUBLICATION: J6

Expressive Storytelling With Timelines   2017-08-31
Uber Visualization Night: A Journey Through Space and Time (Seattle, USA)

Timelines Revisited: Considerations for Expressive Storytelling   2017-07-11
King's College London Department of Informatics (London, UK)

Timelines Revisited: Considerations for Expressive Storytelling   2017-07-10
City University London giCentre (London, UK)

The Timeline Storyteller Custom Visual for Power BI   2017-06-13
Microsoft Data Insights Summit BI Power Hour (Seattle, USA)

Timelines Revisited: Considerations for Expressive Storytelling   2017-04-28
Northeastern University NUVis Visualization Consortium (Boston, USA)

Timelines Revisited: Considerations for Expressive Storytelling   2017-04-27

What Story Does Your Timeline Tell?
OpenVisConf 2017 (Boston, USA)

2017-04-24

Timelines Revisited: Considerations for Expressive Storytelling
Radcliffe Institute at Harvard University (Cambridge, USA)

2016-12-08

Why Visualization? Task Abstraction for Analysis and Design
Dissertation Defence (Vancouver, Canada)
→ RELATED PUBLICATION: T3

2016-03-23

Storytelling with Timeline Data
Data-Driven Storytelling Dagstuhl Seminar (Wadern, Germany)

2016-02-11

Why Visualization? Task Abstraction for Analysis and Design
Microsoft Research (Redmond, USA)

2016-02-01

Matches, Mismatches, and Methods: Multiple-View Workflows for Energy Portfolio Analysis
IEEE InfoVis 2015 (Chicago, USA)
→ RELATED PUBLICATION: J5

2015-10-28

Matches, Mismatches, and Methods: Multiple-View Workflows for Energy Portfolio Analysis
University of Washington (Seattle, USA)

2015-09-04

The Future of Data and Design ... In Visualization Research
Vancouver Data Visualization Meetup (Vancouver, Canada)

2015-05-19

Overview: The Design, Adoption, and Analysis of a Visual Document Mining Tool For Investigative Journalists
IEEE InfoVis 2014 (Paris, France)
→ RELATED PUBLICATION: J2

2014-11-14

Visualizing Dimensionally-Reduced Data: Interviews with Analysts and a Characterization of Task Sequences
ACM BELIV 2014 (Paris, France)
→ RELATED PUBLICATION: W3

2014-11-10

Pre-Design Empiricism for Information Visualization: Scenarios, Methods, and Challenges
ACM BELIV 2014 (Paris, France)
→ RELATED PUBLICATION: W2

2014-11-10

Visualization Task Abstraction from Multiple Perspectives
IEEE VIS Doctoral Colloquium 2014 (Paris, France)

2014-11-08

A Multi-Level Typology of Abstract Visualization Tasks
IEEE InfoVis 2013 (Atlanta, USA)
→ RELATED PUBLICATION: J1

2013-10-15

Investigating Interruptions in the Context of Computerised Cognitive Testing for Older Adults
ACM CHI 2012 (Austin, USA)

2012-05-10

A Tale of Two Studies: Investigating the Impact of Interruptions on Task Performance in Older Adults   2011-05-14
GRAND NCE AGM 2011 (Vancouver, Canada)
→ RELATED PUBLICATION: W1

PUBLICATIONS

Pre-print versions of these publications are available at mattbrehmer.github.io/#pubs

PUBLICATION TYPES: J = *journal article*, C = *conference proceedings*, W = *workshop paper*, TR = *techinical report*, BC = *book chapter*, T = *thesis*, PO = *poster*.

Evaluating Data-Driven Stories & Storytelling Tools   BC1
Fereshteh Amini[*], **Matthew Brehmer**[*], Gordon Bolduan, Christina Elmer, and Benjamin Wiederkehr ([*] equal contribution)
Chapter to appear in *Data-Driven Storytelling*, a forthcoming book edited by Sheelagh Carpendale, Nicholas Diakopoulos, Christophe Hurter, and Nathalie Henry Riche, 2017.

Demonstrating the Value of Visualization: Highlights from the 2017 PacificVis Visual Data Storytelling Contest   Po1
Matthew Brehmer, Kyungwon Lee, Ivan Viola, Jinwook Seo, and Bongshin Lee.
Poster proceedings of the 2017 *IEEE VIS Conference*.

Timelines Revisited: A Design Space and Considerations for Expressive Storytelling   J6
Matthew Brehmer, Bongshin Lee, Benjamin Bach, Nathalie Henry Riche, and Tamara Munzner
In Volume 23, Issue 9 (Sept. 2017) of *IEEE Transactions on Visualization and Computer Graphics*.

ChartAccent: Annotation for Data-Driven Storytelling   C5
Donghao Ren, **Matthew Brehmer**, Bongshin Lee, Tobias Höllerer, and Eun Kyoung Choe
In proceedings of the 2017 *IEEE PacificVis Symposium*.

Why Visualization? Task Abstraction for Analysis and Design   T3
Matthew Brehmer
University of British Columbia PhD Dissertation (April, 2016).

Matches, Mismatches, and Methods: Multiple-View Workflows for Energy Portfolio Analysis   J5
Matthew Brehmer, Jocelyn Ng, Kevin Tate, and Tamara Munzner
In Volume 22, Issue 1 (Jan. 2016) of *IEEE Transactions on Visualization and Computer Graphics (InfoVis 2015)*.

TimeLineCurator: Interactive Authoring of Visual Timelines from Unstructured Text   J4
Johanna Fulda, **Matthew Brehmer**, and Tamara Munzner
In Volume 22, Issue 1 (Jan. 2016) of *IEEE Transactions on Visualization and Computer Graphics (VAST 2015)*.

C-TOC (Cognitive Testing on Computer): Investigating the Usability and Validity of a Novel Self-administered Cognitive Assessment Tool in Aging and Early Dementia

J3

Claudia Jacova, Joanna McGrenere, Hyunsoo S. Lee, William Wang, Sarah Le Huray, Emily F. Corenblith, **Matthew Brehmer**, Charlotte Tang, Sherri Hayden, B. Lynn Beattie, and Ging-Yuek R. Hsiung
In Volume 29, Issue 3 (July 2015) of *Alzheimer Disease and Associated Disorders*.

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

J2

Matthew Brehmer, Stephen Ingram, Jonathan Stray, and Tamara Munzner.
In Volume 20, Issue 12 (Dec. 2014) of *IEEE Transactions on Visualization and Computer Graphics (InfoVis 2014)*.

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

W3

Matthew Brehmer, Michael Sedlmair, Stephen Ingram, and Tamara Munzner
In proceedings of the 2014 *ACM BELIV Workshop (Beyond Time and Errors: Novel Evaluation Methods for Visualization)*.

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

W2

Matthew Brehmer, Sheelagh Carpendale, Bongshin Lee, and Melanie Tory.
In proceedings of the 2014 *ACM BELIV Workshop (Beyond Time and Errors: Novel Evaluation Methods for Visualization)*.

A Multi-Level Typology of Abstract Visualization Tasks

J1

Matthew Brehmer and Tamara Munzner
In Volume 19, Issue 12 (Dec. 2013) of *IEEE Transactions on Visualization and Computer Graphics (InfoVis 2013)*.

Dimensionality Reduction in the Wild: Gaps and Guidance

TR1

Michael Sedlmair, **Matthew Brehmer**, Stephen Ingram, and Tamara Munzner
University of British Columbia Technical Report TR-2012-03 (2012).

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

C4

Matthew Brehmer, Joanna McGrenere, Charlotte Tang, and Claudia Jacova
In proceedings of the 2012 *ACM Conference on Human Factors in Computing Systems (CHI)*.

Usability and the Effects of Interruption in C-TOC: Self-Administered Cognitive Testing on a Computer

T2

Matthew Brehmer
University of British Columbia MSc Thesis (2011).

A Tale of Two Studies: Investigating the Impact of Interruptions on Task Performance in Older Adults

W1

Matthew Brehmer, Charlotte Tang, Joanna McGrenere, and Claudia Jacova
In the work-in-progress proceedings of the the 2011 *GRAND NCE AGM*.

The Haptic Crayola Effect: Exploring the Role of Naming in Learning Haptic Stimuli   C3
Inwook Hwang, Karon MacLean, **Matthew Brehmer**, Jeff Hendy, Andreas Sotirkopoulos, and Seungmoon Choi
In proceedings of the 2011 *IEEE World Haptics Conference*.

Activate Your GAIM: A Toolkit for Input in Active Games   C2
Matthew Brehmer, T.C. Nicholas Graham, and Tadeusz Stach
In proceedings of the 2010 *ACM Future Play Conference*.

Classifying Input for Active Games   C1
Tadeusz Stach, T.C. Nicholas Graham, **Matthew Brehmer**, and Andreas Hollatz
In proceedings of the 2009 *ACM Advances in Computer Entertainment Technology (ACE) Conference*.

Assessing the Effect of Exercise Intensity on Cognitive Task Performance in an Exercise Video Game   T1
Matthew Brehmer
Queen's University B.Comp Thesis (2009).

ACADEMIC SERVICE

Organizing Committee: IEEE VIS 2018 (Co-Chair: Visualization in Practice), IEEE PacificVis 2017-2018 (Co-Chair, Visual Data Storytelling Contest)

Program Committee: IEEE InfoVis (2017), EuroVis State of the Art Reports (2017), IEEE PacifiVis (2018), IEEE PacifiVis (Notes: 2017, 2018), FAT*: Conference on Fairness, Accountability, and Transparency (2018), The Art of Networks III (2018)

Reviewer: IEEE InfoVis (2013, 2014, 2015, 2016), IEEE VAST (2015), IEEE PacificVis (2017), IEEE TVCG (2015, 2016, 2017), EuroVis (2014, 2015, 2017), ACM CHI (2013, 2014, 2015, 2016, 2017), ACM TOCHI (2013), Sage Information Visualization Journal (2015, 2016), ACM SIGGRAPH Asia (2012), GRAND NCE ACM (2012)

Student Volunteer: ACM CHI Conference (2011, 2013, 2015, 2016)

UNIVERSITY SERVICE

University of British Columbia Department of Computer Science: Graduate Admissions and Recruitment Committee (2013-2015), Curriculum Development (CPSC 444: Advanced Human Computer Interaction Methods, 2010-2011), Teaching Assistant (CPSC 444: Advanced Human Computer Interaction Methods, 2010; CPSC 344: Introduction to Human Computer Interaction Methods, 2009)

University of British Columbia Computer Science Graduate Students' Association: Vice President (Social Affairs) (2010-2011), Graduate Student Orientation Committee (2012), Organizer of the Un-Distinguished Lecture Series (2010–2011, 2012–2013)

Queen's University Computing Students' Association: Student Orientation Leader (2005), First Year Representative (2004-2005)

AWARDS

University of British Columbia: Student Service Award (2016), Volunteering Award (2015), Mitacs-Accelerate Graduate Research Internship Program Award (2013-2014), Natural Sciences & Engineering Research Council of Canada (NSERC) Postgraduate Scholarship (2011-2014), Four Year Doctoral Fellowship (2011-2015), Department of Computer Science Merit Scholarship (2009-2011)

Queen's University: Dean's Entrance Scholarship in Computing (2004-2005)

REFERENCES

References are available upon request.