MATTHEW BREHMER

VISUALIZATION RESEARCH AND DEVELOPMENT

CONTACT

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EDUCATION

PhD, Computer Science
UNIV. BRITISH COLUMBIA
2011 - 2016

MSc, Human-Computer Interaction
UNIV. BRITISH COLUMBIA
2009 - 2011

BComp, Cognitive Science
QUEEN'S UNIV. AT KINGSTON
2004 - 2009

EMPLOYMENT HISTORY

Postdoctoral Researcher
MICROSOFT RESEARCH
2016 - 2019

Research Assistant
UNIV. BRITISH COLUMBIA
2009 - 2016

Research Intern
MICROSOFT RESEARCH
2015

Research Intern
PULSE ENERGY / ENERNOC
2013 - 2014

Research Assistant
QUEEN'S UNIV. AT KINGSTON
2009

User Experience Design / Front-End Dev. Intern
EMC DOCUMENTUM
2007 - 2008

REFERENCES

Dr. Tamara Munzner
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UNIV. BRITISH COLUMBIA
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Dr. Ken Hinckley
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Matthew is an expert in **information visualization**, a practice that brings together data analysis, software development, user experience research, and design. He has spoken about his work at venues such as IEEE VIS, ACM CHI, and OpenVisConf, and he has published papers about his work in IEEE TVCG, the top journal for visualization research. He is a program committee member for events including IEEE InfoVis, Information+, and the VIS Arts Program. In 2018, he was a co-organizer of the VisInPractice event at IEEE VIS, the PacificVis Visual Data Storytelling Contest, and the MobileVis Workshop at ACM CHI. His work can be seen and used online and in Microsoft's Power BI.

APPLICATION AREAS

Matthew has applied his expertise in visualization and human-computer interaction in the domains of journalism, personal health, and resource conservation.

CURRENT ROLE

As a postdoctoral researcher at **Microsoft Research**, Matthew focuses on expressive information design tools for storytelling and journalism, as well as visualization for mobile devices. He designs prototypes, develops applications, conducts experiments, analyzes data, writes research papers, and consults with teams at Microsoft.

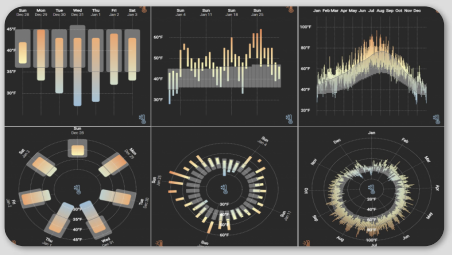
SELECTED PROJECTS

A complete list of projects along with links to interactive applications are available at mattbrehmer.github.io. The projects below are among those that Matthew led.

TIMELINE STORYTELLER

An authoring tool for producing expressive visual narratives about timeline data; a web application and extension for Microsoft Power BI; exports images or iFrame presentations (with Lee, Riche, Tittsworth, Lytvynets, Edge, and White).

timelinestoryteller.com



VISUALIZING RANGES ON MOBILE PHONES

Alternative visual representations designed for mobile phones, motivated by the increasing prevalence of apps and online news reporting on data relating to personal health, climate, and finance (with Lee, Isenberg, and Choe).

aka.ms/ranges-tvcg

VISUALIZATION FOR ENERGY CONSERVATION

An iterative human-centred design process resulted in a series of prototype visual analysis tools for monitoring the energy consumption of large building portfolios (with Ng, Tate, and Munzner).

aka.ms/matches_mismatches

TECHNOLOGIES: CURRENT

At Microsoft, Matthew develops and deploys AZURE web applications using NODE.JS and EXPRESS. He uses NPM and YARN for package management, WEBPACK as a build tool, and GIT for version control. He uses D3.JS for visualizing data and for manipulating the DOM. His current editor of choice is VSCODE for WINDOWS. Much of his work is open source and can be found on GITHUB (username: mattbrehmer).

For creating and managing content on websites, he uses JEKYLL or WORDPRESS.

For analyzing data and generating static charts, he uses R and particularly the GGPLOT2 package. He also uses POWER BI and TABLEAU.

OTHER TECHNOLOGIES

During grad school, Matthew used the SHINY, GGPLOT2, and DATA.TABLE R packages to create analytical applications; he visualized data using D3.JS, PROCESSING, and P5.JS; and before the advent of D3, he used FLARE (the ACTIONSCRIPT port of PREFUSE), as well as the FLEX web application framework.

He produced diagrams and mockups with OMNIGRAFFLE.

Before switching to R, he analyzed data and generated charts using SPSS, NUMBERS, and EXCEL.

Prior to grad school, he developed a toolkit for active video games using C# and the XNA environment.

As a user interface design intern at EMC, he developed interfaces using FLEX (ACTIONSCRIPT) and produced wireframes and mockups using VISIO and PHOTOSHOP.

Finally, he used a variety of programming languages in undergraduate projects and assignments, including: JAVA, C++, C, HASKELL, PROLOG, LISP, and MATLAB.

SELECTED TALKS / VIDEOS

A complete list of talks with links to slides are available at mattbrehmer.github.io/#talks.

Visualizing Ranges over Time on Mobile Phones — 2018 / 10 / 24
IEEE VIS 2018, InfoVis Track
vimeo.com/299859980

The Timeline Storyteller Custom Visual for Power BI — 2017 / 09 / 15
Microsoft Power BI YouTube Channel
youtu.be/bwiMfwBVsSQ

What Story Does Your Timeline Tell? — 2017 / 04 / 24
OpenVisConf 2017
youtu.be/gQKUl_1ryo4

Why Visualization? Task Abstraction for Analysis and Design — 2016 / 02 / 01
Microsoft Research
youtu.be/Gg9UGHu4Qao

Matches, Mismatches, & Methods: Workflows for Energy Portfolio Analysis — 2015 / 10 / 28
IEEE VIS 2015, InfoVis Track
vimeo.com/236169723

SELECTED PUBLICATIONS

A complete list of publications with links to PDFs are available at mattbrehmer.github.io/#pubs.

Timeline Storyteller: The Design & Deployment of an Interactive Authoring Tool for Expressive Timeline Narratives — 2019
Matthew Brehmer, Bongshin Lee, Nathalie Henry Riche, David Tittsworth, Kate Lytvynets, Darren Edge, and Christopher White. To appear in *Proc. of the Computation + Journalism Symposium*.

Visualizing Ranges over Time on Mobile Phones — 2018
Matthew Brehmer, Bongshin Lee, Petra Isenberg, and Eun Kyoung Choe. In *IEEE Trans. Visualization & Computer Graphics* (25-1).

Charticulator: Interactive Construction of Bespoke Chart Layouts — 2018
Donghao Ren, Bongshin Lee, and Matthew Brehmer. In *IEEE Trans. Visualization & Computer Graphics* (25-1).
BEST PAPER HONORABLE MENTION AWARD

Overview: The Design, Adoption, and Analysis of a Visual Document Mining Tool For Investigative Journalists — 2014
Matthew Brehmer, Stephen Ingram, Jonathan Stray, and Tamara Munzner. In *IEEE Trans. Visualization & Computer Graphics* (20-12).

A Multi-Level Typology of Abstract Visualization Tasks — 2013
Matthew Brehmer and Tamara Munzner. In *IEEE Trans. Visualization & Computer Graphics* (19-12)
NOTE: THE MOST CITED IEEE INFOVIS PAPER SINCE 2013.

Investigating Interruptions in the Context of Computerized Cognitive Testing for Older Adults — 2012
Matthew Brehmer, Joanna McGrenere, Charlotte Tang, and Claudia Jacova. In *Proc. ACM Conf. Human Factors in Computing Systems (CHI)*.