

THE UNIVERSITY OF BRITISH COLUMBIA  
*Curriculum Vitae for Faculty Members*

Date: December 5, 2016 Initials:

- SURNAME:** Munzner **FIRST NAME:** Tamara  
**MIDDLE NAME:** Macushla
- DEPARTMENT/SCHOOL:** Computer Science
- FACULTY:** Science
- PRESENT RANK:** Professor **SINCE:** August 2012
- POST-SECONDARY EDUCATION**

(a) *Degrees*

University or Institution	Degree	Subject Area	Dates
Stanford University	Ph.D.	Computer Science	Sep 1995 - Jun 2000
Stanford University	B.S.	Computer Science	Sep 1986 - Jun 1991

**Ph.D. Dissertation:** Interactive Visualization of Large Graphs and Networks  
**Ph.D. Supervisor:** Pat Hanrahan

6. **EMPLOYMENT RECORD**

(a) *Prior to coming to UBC*

University, Company or Organization	Rank or Title	Dates
Compaq Systems Research Center	Research Scientist	9/00-5/02
Microsoft Research	Summer Intern	6/98-9/98
Silicon Graphics, Inc.	Part-Time Consultant and Summer Intern	3/96-6/98
The Geometry Center	Senior Technical Staff	6/92-5/95
The Geometry Center	Apprentice	6/91-6/92
Geometry Supercomputer Project	Summer Intern	6/90-9/90
ETA Systems	Summer and Part-Time Intern	6/86-9/88

Compaq SRC was formerly DEC SRC, before Digital was bought by Compaq. The Geometry Center was the short name of the NSF-funded National Science and Technology Research Center for Computation and Visualization of Geometric Structures, which existed from 1991 to 1998. It was located at the University of Minnesota. It grew out of the smaller Geometry Supercomputer Project, also funded by the NSF. ETA Systems was a supercomputer spinoff from Control Data Corporation.

(b) *At UBC*

Rank or Title	Dates
Associate Head for Research and Faculty Affairs	Jul 2014 - present
Professor	Aug 2012 - present
Associate Professor	Aug 2007 - Aug 2012
Assistant Professor	July 2002 - Aug 2007

(c) *Date of granting of tenure at UBC:* August 2007

## 7. LEAVES OF ABSENCE

### (a) *From UBC*

Type of Leave	Dates
Sabbatical	July 2013 – Jun 2014
Sabbatical	July 2008 – Jun 2009
Medical	Jan 2008 – Jun 2008

### (b) *Visiting Researcher*

University, Company or Organization	Position	Dates
Université de Bordeaux I	Visiting Researcher	Jun 2004 – Jul 2004
Technische Universität Berlin	Visiting Researcher	May 1995 – July 1995

## 8. TEACHING

### (a) *Areas of special interest and accomplishments*

I put considerable effort into updating the undergraduate computer graphics course 314/414 from 2003 to 2005. The current version is based not only on previous offerings at UBC, but also by integrating curricular approaches from several different strong graphics programs. Although the course was renumbered from 414 to 314 in 2004, its content was mostly unaffected by this change. I continue to refine the course each year that I teach it.

In 2003 I introduced a new graduate course in information visualization. At that time, less than one dozen offerings of such a course had ever existed at any university, including the one that I co-taught at Stanford the previous year. I have continued to refine my course in each offering, posting the full curriculum including lectures on a course web page that has had a clear influence on subsequent courses by others. My graduate course was renumbered from 533C (a topics course number) to 547 (a dedicated course number) in 2014, but the content did not change. I now teach the course using the book that I authored, starting with book drafts in 2011 and continuing with the final version from 2014 onwards. In the past few years my course has consistently been the second-largest graduate course in the department, and has several informal auditors in addition to the official registrants listed below. It regularly attracts many students from a wide range of other departments, including electrical and computer engineering, civil engineering, and the iSchool.

I developed a 1.5 credit module (6 weeks, 3 hrs/weeks) for journalism (520M) which uses a subset of the foundational material from my standard graduate course, but with exercises in the Tableau tool tailored for non-programmer journalist students without a background in data analysis. I now co-teach this course with an adjunct who is a working journalist.

I am developing two 1-credit modules (4 weeks, 3 hrs/week) for the new Masters of Data Science program (531 and 532), which also use a subset of the foundational material from my graduate course, but with exercises in the R and python languages tailored to dovetail nicely with the data science curriculum. I co-teach this course with a teaching fellow from statistics.

### (b) *Courses Taught at UBC*

Number	Title
CPSC 111	Introduction to Programming
CPSC 213	Introduction to Systems
CPSC 314	Introduction to Computer Graphics
CPSC 414	Introduction to Computer Graphics
CPSC 533C	Special Topics in Graphics: Visualization

*(table continues on the next page...)*

Number	Title
CPSC 547	Information Visualization
JOURN 520M	Visualization for Journalists
DSCI 531	Data Visualization I
DSCI 532	Data Visualization II

Session	Course			Class Size	Hours Taught Per Week			
	Number	Units	Weeks		Lectures	Tutorials	Labs	Office Hrs
Spring 2017	532	1	4	22	3			1
Fall 2016	531	1	4	22	3			1
Fall 2016	520M	1.5	6	15	3			1
Spring 2016	314	3	13	82	3			2
Fall 2015	520M	1.5	6	14	3			1
Fall 2015	547	3	13	26	3			1
Fall 2014	547	3	13	19	3			1
Spring 2013	314	3	13	66	3			2
Fall 2013	213	3	13	71	3			2
Spring 2012	213	3	13	113	3			2
Fall 2011	533	3	13	12	3			1
Fall 2010	213	3	13	77	3			1
Spring 2010	111	3	13	112	3			1
Spring 2010	314	3	13	64	3			1
Fall 2009	533C	3	13	16	3			1
Spring 2008	314	3	13	.*	3			2
Fall 2007	533C	3	13	6	3			1
Spring 2007	314	3	13	37	3			2
Fall 2006	533C	3	13	8	3			1
Spring 2006	111	3	13	76	3			2
Fall 2005	533C	3	13	20	3			1
Summer 2005	314	3	13	20	3			2
Spring 2005	314	3	13	78	3			2
Fall 2004	533C	3	13	5	3			1
Spring 2004	533C	3	13	21	3			1
Fall 2003	414	3	13	90	3			2
Spring 2003	533C	3	13	13	3			1

(c) *Students Supervised and/or Cosupervised at UBC*

The start year indicates the year I began to supervise a student, not the year the student was enrolled in the program.

**Postdocs Supervised**

Student Name	Inst.	Year		Principal	CoSupervisor
		Start	Finish	Supervisor	
Michelle Borkin	UBC	2014	2015	Tamara Munzner	
Stephen Ingram	UBC	2013	2014	Tamara Munzner	
Michael Sedlmair	UBC	2010	2012	Tamara Munzner	

(table continues on the next page...)

\*Spring 2008 314 course covered by colleagues because of medical leave.

Student Name	Inst.	Year		Principal	CoSupervisor
		Start	Finish	Supervisor	
Miriah Meyer	Harvard	2008	2011	Hanspeter Pfister (Harvard)*	Tamara Munzner*
Melanie Tory	UBC	2004	2006	Tamara Munzner*	Kelly Booth (UBC)*

Borkin is now an assistant professor at Northeastern. Ingram is now at the startup Coho Data. Sedlmair is now a junior professor at Vienna. Meyer is now an assistant professor at Utah. Tory was an associate professor at Victoria and is now a research scientist at Tableau Research.

### PhD Students Supervised

Student Name	Inst.	Year		Principal	CoSupervisor
		Start	Finish	Supervisor	
Anamaria Crisan	UBC	2015	exp. 2018	Tamara Munzner*	Jennifer Gardy (UBC)*
Zipeng Liu	UBC	2016	exp. 2019	Tamara Munzner	
Matt Brehmer	UBC	2011	2016	Tamara Munzner	Joanna McGrenere (UBC)
Stephen Ingram	UBC	2007	2013	Tamara Munzner	
Peter McLachlan	UBC	2006	left 2009	Tamara Munzner	
James Slack	UBC	2005	left 2008	Tamara Munzner	
Heidi Lam	UBC	2004	2008	Tamara Munzner	
Dan Archambault	UBC	2003	2008	Tamara Munzner*	David Auber (Bordeaux)*

Ingram was on leave from the PhD program from fall 2008 to winter 2009, and went on to a postdoc with me. McLachlan took a leave from the PhD program to co-found a startup, Mobify, which is doing so well that he chose to continue leading it rather than return to graduate school. Slack left to pursue other interests. Lam was at Google and is now at Tableau Research. Archambault is now a lecturer at Swansea (equivalent to an assistant professor position in North America).

### MSc Students Supervised

Student Name	Inst.	Year		Principal	CoSupervisor
		Start	Finish	Supervisor	
Kimberly Romagnino	Dextras-UBC	2016	exp. 2017	Tamara Munzner	
Wenqiang Dong	(Dylan) UBC	2016	exp. 2017	Tamara Munzner	
Johanna Fulda	LMU/UBC	2014	2015	Tamara Munzner	Andreas Butz (LMU)
Jessica Dawson	UBC	2011	2013	Tamara Munzner*	Joanna McGrenere (UBC)*
Joel Ferstay	UBC	2012	2013	Cydney Nielsen (BC Cancer)	Tamara Munzner
Stephen Ingram	UBC	2006	2007	Tamara Munzner	Marc Olano (UMBC)
Aaron Barsky	UBC	2006	2008	Tamara Munzner	
Peter McLachlan	UBC	2005	2006	Tamara Munzner	
Qiang Kong	UBC	2004	2006	Tamara Munzner*	Raymond Ng (UBC)*
Adam Bodnar	UBC	2004	2006	Tamara Munzner*	Joanna McGrenere (UBC)*
Dmitry Nekrasovski	UBC	2004	2005	Joanna McGrenere (UBC)*	Tamara Munzner*
Dale Beerman	Virginia	2003	2004	Greg Humphreys (Virginia)	Tamara Munzner
Kristian Hildebrand	Weimar/ UBC	2003	2005	Bernd Froehlich (Weimar)	Tamara Munzner
Matt Williams	UBC	2003	2004	Tamara Munzner	
James Slack	UBC	2003	2005	Tamara Munzner	

Fulda was a visiting student from Munich. Dawson went on to teaching in UBC CS. Ferstay went on to AeroInfo, the company that partially funded his thesis work. Ingram went on to the UBC PhD program. Barsky went BC Cancer and then to Hemisphere Games. McLachlan went on to the UBC PhD program and then co-founded Mobify. Kong went to Electronic Arts. Bodnar went to WorkBrain. Nekrasovski went to OpenText. Beerman went to StudyBlue. Hildebrand was a visiting student at UBC from Sep 2003 to Aug 2004; he went on to the PhD program at TU Berlin. Williams rejoined the Vancouver public school system as a math and computer science teacher.

### Undergraduate Students Supervised

\*Symmetric co-supervision: both faculty members acted as principal supervisors.

Student Name	Inst.	Program	Year		Principal	CoSupervisor
			Start	Finish	Supervisor	
Parmida Esmailpour	UBC	Dir. studies	2016	2016	Tamara Munzner	
Jessica Dawson	UBC	Dir. studies	2009	2011	Joanna McGrenere (UBC)	Tamara Munzner
Anton Zoubarev	UBC	Dir. studies	2009	2009	Tamara Munzner	
Alex Vostrov	UBC	Ugrad thesis	2005	2006	Tamara Munzner	Ken Elwood (UBC Civil)
David Westrom	UBC	Ugrad thesis	2004	2005	Tamara Munzner	
Ciarán Llachlan Leavitt	UBC	Ugrad	2003	2008	Tamara Munzner	
Janek Klawe	UBC	Ugrad thesis	2003	2004	Tamara Munzner	
Keith Lau	UBC	Ugrad thesis	2003	2004	Tamara Munzner	Ron Rensink (UBC)
Jordan Lee	UBC	Ugrad co-op	2003	2004	Tamara Munzner	
Dragana Radulovic	UBC	Ugrad co-op	2003	2004	Tamara Munzner	Raymond Ng (UBC)
Jeffrey Zhihui Zhang	UBC	Ugrad co-op	2003	2004	Tamara Munzner	

Dawson went on to the UBC MSc program. Zoubarev works in a UBC bioinformatics research group. Leavitt joined Slant Six and then Aristocrat. Westrom joined Electronic Arts and then Zynga. Klawe went on to the Princeton PhD program. Lau earned a master's from Cornell and then joined at Bloomberg. Lee joined Electronic Arts. Radulovic joined Joule and then Tata Systems. Zhang joined Business Objects.

### Graduate Supervisory Committees

For PhD students and MSc students outside of computer science, on committee. For MSc CS students, second reader for thesis. In both cases, start date reflects my own involvement with their work, not when the student began their program.

Student Name	Program	Year		Principal
		Start	Finish	Supervisor
Chihua Ma	PhD	2016	cont	Angus Forbes (Univ Illinois Chicago)
Dereck Toker	PhD	2015	cont	Cristina Conati (UBC CS)
Enamul Hoque	PhD	2014	cont	Giuseppe Carenini (UBC CS)
Hasti Seifi	PhD	2014	cont	Karon MacLean (UBC CS)
Rebecca McKnight	MSc	2015	2015	Nick Harvey (UBC CS)
Antoine Poinard	MSc	2015	2016	Joanna McGrenere (UBC CS)
Nayantara Duttachoudhury	MSc	2015	2016	Rachael Pottinger (UBC CS)
Niels Hanson	PhD	2013	2015	Steve Hallam (UBC MicroBio)
Dereck Toker	MSc	2012	2013	Cristina Conati (UBC CS)
Anna Flagg	MSc	2012	2012	Karon MacLean (UBC CS)
Will Chao	MSc	2011	2012	Michiel van de Panne (UBC CS)
Michael Welsman-Dinelle	MSc	2010	2011	Michiel van de Panne (UBC CS)
Chaoying Chiu	PhD	2008	2011	Alan Russell (UBC Civil)
Alan McConchie	MSc	2008	2009	Brian Klinkenberg (UBC Geog)
Dave Ternes	MSc	2008	2008	Karon Maclean (UBC CS)
Michael Huggett	PhD	2006	2007	Edie Rasmussen (UBC SLAIS)
Brian de Alwis	PhD	2004	2008	Gail Murphy (UBC CS)
Mik Kersten	PhD	2004	2007	Gail Murphy (UBC CS)
Jonathan Sillito	PhD	2004	2007	Kris de Volder (UBC CS)
Stephane Durocher	PhD	2002	2006	David Kirkpatrick (UBC CS)
Chen Yang	MSc	2006	2006	Michiel van de Panne (UBC CS)

### (d) Continuing Education Activities

#### Mini-Courses on Information Visualization

- One-day course at ACT, Iowa City IL, July 2016.\*

\*Expenses paid.

- Co-taught one-day data visualization masterclass at VIVID, Sydney Australia, June 2015.\*
- Two one-day courses at Sanger / European Bioinformatics Institutes, Cambridge UK, June 2014.\*
- Four-lecture course at TECS Week, Pune India, January 2008.\*
- Three-morning course at University of Bordeaux I, France, June 2004.\*

**9. SCHOLARLY AND PROFESSIONAL ACTIVITIES**

(a) *Areas of special interest and accomplishments*

(b) *Research or equivalent grants (indicate under COMP whether grants were obtained competitively (C) or non-competitively (NC))*

<b>Agency</b>	<b>Title</b>	<b>Comp</b>	<b>\$/Year</b>	<b>Year(s)</b>	<b>PI (&amp; Co-PIs in italics)</b>
Mobify/ MITACS	Advancing Visualization for Mobile E-Commerce Clickstream Data	C	\$30,000 100%	1: 2016-17	Tamara Munzner
NSERC CREATE	ECOSCOPE: Ecosystem Services, Commercialization, and Entrepreneurship	C	\$1,650,000 5%	6: 2015-21	Steven Hallam & <i>10 others</i>
NSERC Discovery	Accelerating the Improvement of Visualization Design Methodology	C	\$46,000 100%	5: 2014-19	Tamara Munzner
Pulse/ MITACS	Multidimensional Energy Consumption Analysis in Large Organizations: An Information Visualization Design Study	C	\$15,000 100%	2013	Tamara Munzner
VIVA/ MITACS	Tackling the Challenge of Graph Comparison in Genomics	C	\$30,000 100%	2013	Tamara Munzner & <i>C. Nielsen</i>
NSERC Discovery	Building and Evaluating Information Visualization Systems	C	\$25,000 100%	5: 2008-12 (+1 yr. ext.)	Tamara Munzner
NSERC Strategic	Visually Enhanced Exploration of High-Dimensional Data	C	\$163,216 25%	3: 2007-10 (+2 yr. ext.)	Torsten Moeller & <i>T. Munzner, N. de Freitas, M. Tory</i>
AT&T Labs	LiveRAC on Daytona	NC	\$25,313 100%	2009	Tamara Munzner
Google	Session Viewer: A Tool to Visualize and Analyze Search Session Data	NC	\$48,820 100%	2007	Tamara Munzner
AT&T Labs	Visualization of Large Network Oriented Datasets	NC	\$50,520 \$47,810 \$39,000 100%	2008 2007 2006	Tamara Munzner
NSERC Discovery	Scalable Information Visualization	C	\$21,000 100%	5: 2003-07	Tamara Munzner
Agilent Labs	Location Constrained Graph Layout Algorithms	NC	\$29,000 100%	2007	Tamara Munzner
Agilent Labs	Information Visualization Evaluation	NC	\$36,000 100%	2005	Tamara Munzner
GEOIDE NCE	CIRCUITS: Collaborative Interdisciplinary Research on Communities Using Information Technology for Sustainability	C	\$124,500 15%	2: 2005-06	John Robinson & <i>13 others</i>

*(table continues on the next page...)*

\*Expenses paid.

Agency	Title	Comp	\$/Year	Year(s)	PI (& Co-PIs in italics)
NSF ITR subcontract	Exploring the Tree of Life	C	\$65,000	2003	Tamara Munzner
			\$73,476	2004	
			100%		
IRIS NCE	Information Visualization for Data Mining	C	\$35,000	2003	Tamara Munzner
			100%		
NSERC RTI	Displays of Disparate Resolution and Size	C	\$88,332	2003	Tamara Munzner & <i>K. MacLean, J. McGrenere, M. van de Panne</i>
			33%		
GEOIDE NCE	GeoCognito: Connecting People with Ideas and Ideas with Place	C	\$75,000	2004	John Robinson & <i>8 others</i>
			\$75,000	2003	
			\$12,500	2002	
			20%		
UBC	Startup Funds	NC	\$60,000	2002	Tamara Munzner
			100%		

(c) *Keynotes**Visualization and Journalism: Four Vignettes*

Computation + Journalism Symposium 2016, Stanford CA, 10/16.\*

*Visualization Analysis & Design*

Information Plus Conference (InfoPlus) 2016, Vancouver BC, 6/16.

IEEE Symposium on Pacific Visualization (PacificVis) 2016, Taipei Taiwan, 5/16.\*

*Visualization Analysis & Design for Biology*

IEEE Symposium on Biological Visualization (BioVis) 2014, Boston MA, 7/14.\*

*Graph Drawing Through the Lens of a Framework for Analyzing Visualization Methods*

Graph Drawing Conference (GD) 2013, Bordeaux France, 9/13.\*

*Dimensionality Reduction From Several Angles*

Workshop on Visual Analytics for Multidimensional Projections (VAMP) 2013, Leipzig Germany, 6/13.\*

*Visualization Principles*

Workshop on Visualizing Biological Data (VizBi) 2011, Boston MA, 3/11.\*

(d) *Invited Presentations (Non-Conference)**Visualization Analysis & Design for Business Intelligence*

Disney Research, Glendale CA, 7/15\*

*Visualization Analysis & Design for Genomics*

Centre for Heart Lung Innovation, St. Paul's Hospital, Vancouver BC, 7/15

*Visualization Analysis & Design*

University of Illinois at Chicago Distinguished Lecture, Chicago IL, 4/15\*

Tableau Software, Seattle WA, 2/15\*

Microsoft Research, Seattle WA, 2/15

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\*Expenses paid.

City University London, London UK, 2/15\*

*Visualization Analysis & Design for Biology*

UBC CS 314 Computer Graphics (Guest Lecture), Vancouver BC, 10/14.

*Variant View: Visualizing Sequence Variants in their Gene Context*

Oxford University, Oxford UK, 7/14

*Data Visualization in Genomics and In-Car Network Engineering*

City University London, London UK, 7/14

*A Duo of Visualization Design Studies*

University of Vienna, Vienna Austria, 5/14\*

*A Trio of Visualization Design Studies*

Northwestern University, Chicago IL, 4/14\*

*Dimensionality Reduction From Several Angles*

University of Sydney, Sydney Australia, 6/15

Johannes Kepler University, Linz Austria, 5/14

Distinguished Lecture, UNC Charlotte, Charlotte NC, 4/14\*

SCI Distinguished Lecture, University of Utah, Salt Lake City UT, 2/13\*

FODAVA Distinguished Lecture, Georgia Tech, Atlanta GA, 12/12\*

*Visualization Principles*

Twitter, San Francisco CA, 6/12

Exploratorium, San Francisco CA, 6/12\*

*Visualization and Biology: Fertile Ground for Collaboration*

Technical University of Eindhoven, Eindhoven Netherlands, 6/09

Institute for Innovative Computing, Harvard University, Boston MA, 2/09

Harvard Medical School, Harvard University, Boston MA, 2/09

Broad Institute, Boston MA, 2/09\*

*Frameworks/Models*

Harvard CS 171, Visualization (Guest Lecture), Boston MA, 2/09

*Scalable Visual Comparison of Biological Trees and Sequences*

University of Maryland College Park, College Park MD, 5/06\*

Distinguished Lecture, University of Maryland Baltimore County, Baltimore MD, 5/06\*

Indiana University, Bloomington IN, 2/06\*

Stanford Computer Systems Lab Colloquium, Stanford CA, 5/04

*15 Views of a Node-Link Graph: An InfoVis Portfolio*

Google, Mountain View CA, 6/06

Agilent Labs, Santa Clara CA, 6/06

National Institutes of Health, Bethesda MD, 5/06

FOO (Friends of O'Reilly) Camp, Sebastopol CA, 8/05

Information Esthetics Lecture Series One, New York NY, 7/05\*

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\*Expenses paid.



*Information Visualization at UBC*

IBM TJ Watson Research, Hawthorne NY, 7/05

*Information Visualization with Accordion Drawing*

AT&amp;T Research, Florham Park NJ, 7/05

*TreeJuxtaposer: Scalable Tree Comparison using Focus+Context with Guaranteed Visibility*

CAIDA/SDSC, San Diego CA, 8/03

*Interactive Information Visualization*

SFU Cmpt 775, Scientific Visualization (Guest Lecture), Burnaby BC, 11/04

UBC COGS 300 (Guest Lecture), Vancouver BC, 10/04

UBC CPSC 349 Honours Seminar (Guest Lecture), Vancouver BC, 10/04

SFU Cmpt 878, Scientific Visualization (Guest Lecture), Burnaby BC, 10/03

UBC CPSC 349 Honours Seminar (Guest Lecture), Vancouver BC, 9/03

Microsoft Research, Redmond WA, 7/03

UBC CPSC 414 Intro Graphics (Guest Lecture), Vancouver BC, 3/03

UBC CPSC 349 Honours Seminar (Guest Lecture), Vancouver BC, 10/02

*Interactive Visualization of Large Trees and Graphs*

University of Bordeaux, Bordeaux France, 12/02

University of Calgary, Calgary AB, 9/02

University of British Columbia, Vancouver BC, 4/02\*

UC Santa Cruz, Santa Cruz CA, 4/02\*

University of Minnesota, Minneapolis MN, 4/02\*

UC Davis, Davis CA, 4/02\*

University of Utah, Salt Lake City UT, 3/02\*

Georgia Tech, Atlanta GA, 3/02\*

*Visual Structural Comparison Between Evolutionary Trees*

New York Academy of Sciences, New York NY, 2/02\*

*Interactive Visualization of Large Graphs and Networks*

UT Austin, Austin TX, 3/01

UC Berkeley, Berkeley CA, 10/00

CWI, Amsterdam Netherlands, 7/00

Philips Design, Eindhoven Netherlands, 7/00

Graz University of Technology, Graz Austria, 7/00

Compaq SRC, Palo Alto CA, 5/00

Lucent/Bell Labs, Naperville IL, 4/00

*Fast Layout and Drawing of Large Directed Graphs Using Spanning Trees in 3D Hyperbolic Space*

CAIDA, San Diego CA, 11/98

HP Labs, Palo Alto CA, 11/98

Bell Labs, Murray Hill NJ, 2/98

AT&amp;T Research, Florham Park NJ, 2/98

*H3: Laying Out Large Directed Graphs in 3D Hyperbolic Space*

Alexa, San Francisco CA, 1/98

AT&amp;T Research, Florham Park NJ, 9/97

UC Santa Cruz, Santa Cruz CA, 6/97

*Visualizing the Web in 3D Hyperbolic Space*

SRI, Menlo Park CA, 4/98

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\*Expenses paid.

MSRI, Berkeley CA, 12/96  
BayCHI, Palo Alto CA, 11/96

*Visualizing the Global Topology of the MBone*  
MSRI, Berkeley CA, 12/96  
Interval Research, Palo Alto CA, 12/96

*The Making of Outside In and The Shape of Space*  
University of Bielefeld, Bielefeld Germany, 7/95  
University of Bonn, Bonn Germany, 7/95

*Integrating 3D Visualization with the World Wide Web*  
Apple, Sunnyvale CA, 2/96  
University of Bielefeld, Bielefeld Germany, 7/95  
University of Bonn, Bonn Germany, 7/95  
ZIB, Berlin Germany, 6/95

*Exploring Science through Video*  
*3D Visualization in Science*  
Spelman College, Atlanta GA, 2/95\*

*Visualizing the Invisible*  
Atlanta College of Art, Atlanta GA, 2/95

*Mathematical Visualization Using Geomview*  
Spelman College, Atlanta GA, 2/95\*  
Swarthmore-Bryn Mawr Joint Visualization Project, Swarthmore PA, 6/94  
Gustavus Adolphus College, St. Peter MN, 11/93  
St. John's College, Collegeville MN, 11/93

(e) *Invited Conference/Workshop Presentations*

*I sense a great disturbance in the Force: The replication crisis in psychology & its possible repercussions for the future of vis evaluation; or, What's making me lose sleep lately*  
Panel: On the Future of Evaluation and BELIV, BELIV 2016, Baltimore MD, 10/16

*Visualization Analysis & Design*  
Graphics Interface 2016, Victoria BC, 6/16\*  
Dagstuhl Seminar: Bridging Information Visualization with Machine Learning, Wadern Germany, 3/15

*Scales and Methods of Engagement*  
VA Tool Users and Universities Panel, CANVAS 2014 Workshop, Vancouver BC, 8/14

*Variant View: Visualizing Sequence Variants in their Gene Context*  
BioIT World Conference, Boston MA, 4/14

*Visualization for Hackers: Why It's Tricky, and Where to Start*  
Hackers On Planet Earth (HOPE) X, New York NY, 7/14

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\*Expenses paid.

*Dimensionality Reduction From Three Angles*

SIAM Data Mining Workshop on Exploratory Data Analysis, Philadelphia PA, 4/14

*Visualization: Why It's Tricky, Where To Start*

Programming Knowledge Representation Workshop, Bellairs Barbados, 2/14

*Visualization Principles*

Cytoscape Symposium on Network Visualization, San Francisco CA, 12/12

*Applying Information Visualization Principles to Biological Network Displays*

Human Vision and Electronic Imaging (HVEI) 2011, San Francisco CA, 1/11

*MulteeSum: A Tool for Comparative Spatial and Temporal Gene Expression Data*

THINK Conference 2010, Santa Cruz CA, 11/10

*Visualization and Biology: Fertile Ground for Collaboration*

bigDATA Workshop, University of British Columbia, 5/10

*Visualization Process and Collaboration*

Dagstuhl Scientific Visualization Workshop, Wadern Germany, 6/09

*Biology is Destiny: Of Graphs and Genes*

Asilomar Microcomputer Workshop 2009, Monterey CA, 4/09

*Big Data, Visualization, and Systems Biology*

THINK Conference 22, Santa Cruz CA, 11/08

*Research Cycles, Collaboration, and Visualization*

VIEW Workshop, Leiden Netherlands, 6/07 \*

*When To Walk Away: Questions To Ask In Infovis Projects*

Dagstuhl Seminar on Information Visualization, Wadern Germany, 5/07

*Scalable Drawing of Trees and Graphs*

Joint Statistical Meeting (Invited Session), Seattle WA, 8/06

*LiveRAC: Live Reorderable Accordion Drawing*

AT&amp;T Labs University Symposium, Florham Park NJ, 8/06

*TopoLayout: Layout of Graphs by Topological Feature*

THINK Conference 21, Santa Cruz CA, 11/05

*Scalable Visual Comparison of Biological Trees and Sequences*

PaRISTIC, Bordeaux France, 11/05\*

*Steerable, Progressive Multidimensional Scaling*

Asilomar Microcomputer Workshop 2005, Monterey CA, 4/05

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\*Expenses paid.

*Scalable Visualization with Accordion Drawing*  
Vancouver Studies in Cognitive Science 2005, Vancouver BC, 2/05

*State of the Field: InfoVis*  
NSF/NIH Visualization Research Challenges Fall Workshop, Bethesda MD, 9/04.

*Scalable Visual Comparison of Biological Trees and Sequences*  
Mathematical Foundations of Scientific Visualization, Computer Graphics, and Massive Data Exploration, Banff AB, 5/04.  
Asilomar Microcomputer Workshop, Monterey CA, 4/04

*Human Perception Tidbits*  
THINK Conference 19, Fresno CA, 11/03

*Visual Comparison of Large Evolutionary Trees.*  
Quintessence: The Clumpy Matter of Art, Science and Math Visualization, Banff AL, 9/02

*Information Visualization for Systems People*  
Usenix 2002, Monterey CA, 6/02

Workshop Participant  
National Science Foundation Assembling the Tree of Life Workshop II, Davis CA, 10/00

*Video Topology*  
Asilomar Microcomputer Workshop, Asilomar CA, 4/00

*Interactive Navigation of Large Graphs and Networks.*  
Workshop on Data Visualization, Memphis TN, 6/99

*Interactive Navigation of Large Networks.*  
Asilomar Microcomputer Workshop, Asilomar CA, 4/99

*Guaranteed Frame Rate Drawing for Interactive Navigation of Large Graphs.*  
DIMACS Workshop on External Memory Algorithms and/or Visualization, Rutgers NJ, 5/98

*H3: Laying Out Large Directed Graphs in 3D Hyperbolic Space*  
THINK Conference 13, Santa Rosa CA, 11/97

*Information Visualization with VRML*  
World Movers, San Francisco CA, 2/97

*Visualizing the Global Topology of the MBone*  
Workshop on Software and Mathematical Visualization, Princeton NJ, 6/96

*Dimension, Space, Information Visualization and the Web*  
Imagina 96, Monte Carlo, Monaco, 2/96\*

*Integrating 3D Visualization with the World Wide Web*  
International Workshop on Visualization and Mathematics,

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\*Expenses paid.

Technical University of Berlin (SFB288), Berlin Germany, 6/95

*Visualization Videos* talk

*Mathematical Visualization Using Geomview* demo

Fourth MSI Workshop on Computational Geometry, Cornell University, Ithaca NY, 10/94

*Mathematical Visualization Using Geomview.*

Regional Geometry Institute, Smith College, Amherst MA, 7/93

*Introduction to Geomview.*

Second MSRI Conference on Geometric Visualization,

Mathematical Sciences Research Institute, Berkeley CA, 10/92 (with Mark Phillips and Stuart Levy)

(f) *Peer-Reviewed Tutorials*

*Visualization Analysis & Design*

Course: Visualization Analysis & Design

VIS 16, Baltimore MD, 10/16\*

VIS 15, Chicago IL, 10/15\*

VIS 14, Paris France, 11/14\*

*Visual Encoding*

*Navigation through Space*

Course: Seeing, Hearing, and Touching: Putting It All Together

SIGGRAPH 04, Los Angeles CA, 8/04\*

*Applications in Information Visualization*

Course: Multimodal Interface Design

SIGGRAPH 03, San Antonio TX, 07/03\*

*Survey of Visualization Toolkits*

Course: Design and Application of Object-Oriented 3D Visualization Systems

SIGGRAPH 97, Los Angeles CA, 8/97\*

*Visualizing Mathematics through Interactive Software*

*Visualizing Mathematics through Video*

Course: Visualizing Mathematics

SIGGRAPH 95, Los Angeles CA, 8/95\*

*Basic Issues on Computer-aided Math Visualization*

Two-day course, with Mark Phillips and Stuart Levy

AMS/MAA Joint Summer Meeting, Minneapolis MN, 8/94

(g) *Peer-Reviewed Panels*

**Panel: Pathways for Theoretical Advances in Visualization (won Best Panel award)**

VIS 16, Baltimore MD, 10/13

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\*Expenses paid.

*Teaching Across the Researcher-Practitioner Gap*

Vis, The Next Generation: Teaching Across the Researcher-Practitioner Gap  
VIS 15, Chicago IN, 10/15

*Evaluation, When and How*

Panel: How Much Evaluation is Enough? VIS 13, Atlanta GA, 10/13

*Grassroots Reproducibility: Just Do It!*

Panel: Reproducible Visualization Research: How Do We Get There? VisWeek 12, Seattle WA, 10/12

*UBC Grad Course in InfoVis*

Panel: Perspectives on Teaching Data Visualization (**won Best Panel award**)  
VisWeek 10, Salt Lake City UT, 10/10

*Outward and Inward Grand Challenges*

Panel: Grand Challenges in Information Visualization (**won Best Panel award**)  
InfoVis 08, Columbus OH, 10/08

*Mathematics For Visualization versus Visualization Of Mathematics*

Panel: The Mathematical Concepts Beneath Contemporary Visualization  
Visualization 07, Sacramento CA, 10/07

*A Panorama of Publication Pitfalls*

Panel: Publishing Your Visualization Research  
Visualization 06 Doctoral Colloquium, Baltimore MD, 10/06  
Panel: How to Get Your Paper Published  
VIEW Workshop, Leiden Netherlands, 6/07  
SFU (Guest Lecture), Burnaby BC, 10/07

*Visualization Careers: Academia*

Panel: Visualization Careers  
Visualization 06 Doctoral Colloquium, Baltimore MD, 10/06

*Information and Scientific Visualization: Separate but Equal*

Panel: Information and Scientific Visualization: Separate but Equal or Happy Together At Last  
Visualization 03, Seattle WA, 10/03

*In Search Of: Prescriptive Advice for Visualization*

Panel: Visualization Needs More Visual Design!  
Visualization 99, San Francisco CA, 10/99

*Panel: Mathematical Visualization: Standing at the Crossroads*

Moderator and co-organizer (**won Best Panel award**)  
Visualization 96, San Francisco CA, 11/96

*3D Graphics through the Internet*

Panel: 3D Graphics through the Internet: A Shootout  
SIGGRAPH 95, Los Angeles CA, 8/95

*Visualization through the World Wide Web with Geomview, Cyberview, W3Kit, and WebOOGL*

Panel: Visualization and the Web  
World Wide Web Fall 94, Chicago IL, 10/94

(h) *Conference Participation (Organizer, Keynote Speaker, etc.)*

**Steering/Executive Committees**

- **Executive Committee Chair, VIS, 2012–**  
 VIS the new name for VisWeek, the major umbrella event in our area with the three major conferences VAST, InfoVis, and SciVis and additional symposia and workshops including BioVis, LDAV, and VizSec.
- **Steering Committee, InfoVis, 2010–2014, 2015–**
- **Steering Committee Chair, InfoVis, 2014–2015**  
 (IEEE Conference on Information Visualization)
- **Executive Committee Member, VisWeek, 2011–2012**
- **Steering Committee, BioVis (IEEE Symposium on Biological Data Visualization), 2012–2013**  
 I was a founding member of the SC for this new venue.

**Papers Chair**

- **Papers Co-Chair, EuroVis 2010 (Eurographics/IEEE VGTC Symposium on Visualization), Bordeaux**
- **Papers Co-Chair, EuroVis 2009, Berlin**
- **Papers Co-Chair, InfoVis 2004 (IEEE Symposium on Information Visualization), Austin**
- **Papers Co-Chair, InfoVis 2003, Seattle**

**Organizer**

- **Best Papers Committee, PacificVis 2016**
- **Co-Organizer, Dagstuhl Seminar: Bridging Information Visualization with Machine Learning, 2015, Germany**
- **Best Papers Chair, InfoVis 2006**
- **Best Papers Committee, InfoVis 2005**
- **Massive Data Thrust Co-Organizer, Mathematical Foundations of Scientific Visualization, Computer Graphics, and Massive Data Exploration Workshop, 2004, Banff**
- **Posters Co-Chair, InfoVis 2002**
- **Posters Chair, InfoVis 2001** I began the posters program as the inaugural chair
- **Co-Organizer, AMW 2002 (Asilomar Microcomputer Workshop)**
- **Co-Organizer, AMW 2001**

Conference participation in the form of keynote addresses, peer-reviewed panels, and peer-reviewed tutorials is listed in Section 9.

**10. SERVICE TO THE UNIVERSITY**

(a) *Memberships on committees, including offices held and dates*

**Departmental Committees, Chair**

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2014-now	Faculty Affairs
2014-2016	Faculty Recruiting
2011-2013	Peer Teaching Evaluation
2004-2008	FoWCS: Focus On Women in Computer Science

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**Departmental Committees, Member**

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2016-now	Faculty Recruiting
2012-2013	Faculty Affairs
2010-2011	Graduate Recruiting
2010-2011	Space

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*(table continues on the next page...)*

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2009-2010	Faculty Affairs
2009-2010	Faculty Recruiting
2008-2010	Promotion & Tenure Mini-Committee
2007-2008	Faculty Recruiting
2005-2008	Brown Bag Facilitator
2003	Administrative Manager ad hoc Search
2002-2006	Curriculum

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### ICICS Committees, Member

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2003-2004	Distinguished Lecture Selection
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(b) *Other service, including dates*

#### Departmental Outreach Talks

- January 2012
- February 2006
- March 2005

#### Chair, Doctoral Proposal Defense

- Aug 2014, Mikhail Bessmeltsev

#### Examiner, University Doctoral Exam

- July 2015, Dutch Meyer
- July 2011, Thomas Hentrich

#### Chair, University Doctoral Exam

- April 2010, Victor F. Sanchez Silva
- August 2009, Alex Wang

## 11. SERVICE TO THE COMMUNITY

(a) *Memberships on scholarly committees, including offices held and dates*

- 2014-, IEEE VGTC Executive Committee Member
- 2004-2008, IEEE VGTC (Visualization and Graphics Technical Committee) Executive Committee Member At Large

I list additional committee memberships associated with the organization of conferences or workshops in Section 9(h), and those associated with the reviewing of papers in Section 11(d).

(b) *Editorships (list journal and dates)*

#### Book Series Editorships

- Editor 2014–now: AK Peters Visualization Series, CRC Press.

#### Guest Editorships



- Eurographics Computer Graphics Forum 29:3, June 2010 (special issue, Proc. EuroVis 10). (with Guy Melançon and Daniel Weiskopf)
- Eurographics Computer Graphics Forum 28:3, June 2009 (special issue, Proc. EuroVis 09). (with Hans-Christian Hege and Ingrid Hotz)
- Information Visualization, Palgrave. 4:2, Summer 2005. (with Matt Ward)
- IEEE TVCG (Trans. Visualization and Computer Graphics) 11:2, July/August 2005. (with Matt Ward)
- Information Visualization, Palgrave. 3:2, Summer 2004. (with Stephen North)
- IEEE TVCG (Trans. Visualization and Computer Graphics) 10:4, July/August 2004. (with Stephen North)
- IEEE CG&A (Computer Graphics and Applications), Special Issue on Information Visualization, Jan/Feb 2002.

(c) *Program Committees*

- BELIV: BEyond time and errors: novel evaluation methods for Information Visualization 2010, 2012, 2014, 2016
- InfoVis: IEEE Symposium on Information Visualization 2000-2004, 2006-2007, 2009-2010, 2012-2014, 2016
- Graph Drawing: 2015
- EuroVis Short Papers: 2015
- BioVis: IEEE Symp. on Biological Visualization 2014-2015
- EuroVis: Eurographics/IEEE VGTC Symposium on Visualization 2005-2008, 2011-2014
- ISMB: Intl. Conf. on Intelligent Systems in Molecular Biology 2012
- Vis: IEEE Visualization 2003, 2009
- MediVis: Conference on Medical/Biomedical Visualization 2007
- I3D: Symposium on Interactive 3D Graphics 2005
- GI: Graphics Interface 2003-2004
- ISMA: Internet Statistics and Metrics Analysis - Network Visualization 1999
- DIMACS Workshop on External Memory Algorithms and Visualization 1998
- VRML: Virtual Reality Modelling Language Symposium 1997
- VisMath: Visualization and Mathematics 1997

(d) *Reviewer (journal, agency, etc., including dates)*

**Funding agencies**

- FWF: Austrian Science Fund 2006, 2010, 2013, 2015
- NSERC: Natural Sciences and Engineering Research Council 2003-2005, 2007, 2010-11, 2013
- NWO: Netherlands Organisation for Scientific Research, 2011
- ERC: European Research Council 2010
- MITACS: Mathematics of Information Technology and Complex Systems 2009-10
- US NSF: United States National Science Foundation 2007, 2009
- FQRNT: Fonds Québécois de la Recherche sur la Nature et les Technologies 2009
- UK EPSRC: United Kingdom Engineering and Physical Sciences Research Council 2007
- UC-MICRO: Univ. California Microelectronics Innovation and Computer Research Opportunities 2006

**Journals**

- TVCG: IEEE Transactions on Visualization and Computer Graphics 2002-2014, 2016
- IVS: Information Visualization Journal 2002, 2004, 2005, 2008-2010, 2014
- F1000: F1000 Research 2014
- CG: Computers&Graphics 2010, 2013

- Neurocomputing, 2013
- PLoS ONE: Public Library of Science ONE 2011-2012
- IJCM: International Journal of Computer Mathematics 2011-2012
- Computer: IEEE Computer 2011-12
- Bioinformatics: BMC Bioinformatics 2005, 2008, 2011
- CG&A: IEEE Computer Graphics and Applications 1996-1997, 2003-2005, 2007, 2009, 2011
- EE: Ecology and Evolution 2011
- IJHCS: International Journal of Human-Computer Studies 2009-2010
- CGF: Computer Graphics Forum 2010
- TOG: IEEE Transactions on Graphics 2009
- ACM Computing Surveys 2004, 2006-2007
- CACM: Communications of the ACM 2007
- ToCHI: IEEE Transactions on Computer Human Interaction 2006
- AMM: American Mathematical Monthly 2007
- TIR: Transactions on Internet Research 2006
- FM: Field Methods 2006
- TAP: IEEE Transactions on Applied Perception 2003

## Conferences

- SIGCHI Papers 2005-2007, 2009-2017
- SIGGRAPH Papers 1999-2001, 2004-2007, 2010-2011
- BioVis Contest Judge, 2011
- InfoVis: IEEE Conf. Information Visualization 2011
- UIST: User Interface Software and Technologies 1999, 2001, 2006, 2010
- Vis: IEEE Visualization 1996, 2005-2007, 2010
- SIGGRAPH Asia Papers 2009-2010
- VAST: IEEE Conf. Visual Analytics Science and Technology 2006-2007, 2009-2010
- Eurographics 2003, 2007, 2009
- WABI: Workshop on Algorithms in Bioinformatics 2009
- SOCG: ACM Symposium on Computational Geometry 2009
- SIGGRAPH Sketches 2006-2007
- VMLS: Visualization in Medicine and Life Sciences 2006
- SIGGRAPH Courses 2002-2006
- InfoVis: IEEE Symp. Information Visualization 1997-2000, 2005
- NPAR: Non-Photorealistic Animation and Rendering Symposium 2004
- VDA: Visual Data Analysis 2003
- SIGKDD: Knowledge Discovery and Data Mining 2003
- I3D: ACM Symposium on Interactive 3D Graphics 2000
- VisSym: Joint Eurographics/IEEE Symposium on Visualization 2000
- VRML: Virtual Reality Modelling Language Symposium 1998
- SCG Video: Symposium on Computational Geometry (video proceedings) 1996

## Publishers

- Morgan Kaufmann books 2009-2010
- AK Peters books 2006-2007, 2009
- Springer-Verlag books 2005

(e) External examiner (indicate university and dates)

Student Name	Year	Institution	Country	Supervisor	Examined
Sarah Goodwin	2014	City University London	UK	Jason Dykes	In person
Michael Sedlmair	2010	LMU Munich	Germany	Andreas Butz	By Skype
Danny Holten	2009	TU Eindhoven	Holland	Jarke J. van Wijk	In person
*	2007	*	Australia	*	By report
Jérôme Thièvre	2006	INA / Univ. de Montpellier	France	Mountaz Hascoët	In person
François Boutin	2005	Université de Montpellier	France	Guy Melançon	In person
Fabien Jourdan	2004	Université de Montpellier	France	Guy Melançon	In person
David Auber	2002	Université de Bordeaux I	France	Maylis Deleste	In person

\* Identifying information elided in keeping with institution's confidentiality policy.

(f) *Consultant (indicate organization and dates)*

- Lytix, 2010-2012

(g) *Other service to the community*

#### Advisory Boards and Site Visits

- National Resource for Network Biology External Advisory Council, 2011–2014. Site visits May 2011 San Diego, Dec 2012 San Francisco, Jul 2014 Boston.
- Microsoft-INRIA Joint Research Center Site visit June 2010 Paris France.

## 12. AWARDS AND DISTINCTIONS

(a) *Awards for Scholarship (indicate name of award, awarding organizations and date)*

- Best Panel Awards: IEEE VIS/Visualization 1996, 2008, 2010, 2016
- IEEE VGTC Visualization Technical Achievement Award 2015
- Best Paper Awards, Honorable Mention: IEEE InfoVis 2009, 2012
- Best Paper Awards, Honorable Mention (2nd Best): EuroVis 2009
- InfoVis Contest, Overall First Place Winner: IEEE InfoVis 2003
- Microsoft Research PhD Fellowship 1998-2000
- National Science Foundation Graduate Research Fellowship (USA) 1995-1998

## 13. OTHER RELEVANT INFORMATION (Maximum One Page)

### Publication Strategy

My research is primarily published in visualization venues. The strongest conferences have at least as much impact as the top journals as a means of disseminating research results in this area. All of the top-tier conferences now publish their proceedings as special issues of journals, with a stringent two-phase peer review process and acceptance rates around 25% - 30%.

- **TVCG** (IEEE Transactions Visualization and Computer Graphics) is the top journal for visualization broadly.
- **IVS** (Information Visualization Journal, Palgrave) is the top journal for infovis specifically.
- **InfoVis** (IEEE Conference on Information Visualization) is without doubt the top venue. It was formally a symposium from its founding in 1995 to 2006, and became the primary venue in the area almost immediately. The proceedings have been published as a special issue of TVCG since 2006; prior to that, a small set of best papers was published in TVCG and IVS. Acceptance rates have been under 25% for the past ten years.

- **EuroVis** (Eurographics/IEEE VGTC Symposium on Visualization) is the second strongest venue. The proceedings is published as a special issue of Computer Graphics Forum. The review process is similar to InfoVis, with acceptance rates around 30% in recent years.
- **VAST** (IEEE Conference on Visual Analytics Science and Technology) is the main venue for visual analytics, a closely related research area. In its first four years from 2006-2009 it was a symposium with acceptance rates ranging from 43% to 38%; in 2010 it switched to conference status and the acceptance rate is currently around 25%.
- **CHI** (ACM Conference on Human Factors in Computing Systems) is the top conference in the related field of human-computer interaction, and publishes several infovis papers each year that have an interaction or evaluation focus. Acceptance rates are in the 15-25% range.

Occasionally a domain scientist collaborator includes my students and/or me as authors on papers published in their own literature, indicating that they consider the visualization system a critical part of their scientific work. I count these instances as a strong sign of success.

#### 14. REFEREED PUBLICATIONS

The standard authorship order is that students and postdocs are listed first and faculty last, except in unusual circumstances. Within each group, the order is determined by the level of contribution. Names of students or postdocs that I supervised are in bold. My h-index was 40 as of November 2016. Citation counts given are from Google Scholar for all works with 100 or more citations as of then.

##### (a) Journals

J37: Timelines Revisited: A Design Space and Considerations for Expressive Storytelling. **Matthew Brehmer**, Benjamin Bach, Bongshin Lee, Nathalie Henry Riche, and Tamara Munzner. IEEE Transactions on Visualization and Computer Graphics, to appear.

J36: Matches, Mismatches, and Methods: Multiple-View Workflows for Energy Portfolio Analysis. **Matthew Brehmer**, Jocelyn Ng, Kevin Tate, and Tamara Munzner. IEEE Trans. Visualization and Computer Graphics (Proc. IEEE InfoVis 2015) 22(1):449–458, 2016.

J35: TimeLineCurator: Interactive Authoring of Visual Timelines from Unstructured Text. **Johanna Fulda**, **Matthew Brehmer**, and Tamara Munzner. IEEE Trans. Visualization and Computer Graphics (Proc. IEEE InfoVis 2015) 22(1):300–309, 2016.

J34: B. Renoust, G. Melançon, T. Munzner. Detangler: Visual Analytics for Multiplex Networks. Computer Graphics Forum (Proc. EuroVis 2015) 34(3):321–330, 2015.

J33: **Jessica Dawson**, Tamara Munzner, and Joanna McGrenere. A Search Set Model of Path Tracing in Graphs. Information Visualization, 14(4):308338, 2015.

J32: **Matthew Brehmer**, **Stephen Ingram**, Jonathan Stray, and Tamara Munzner. Overview: The Design, Adoption, and Analysis of a Visual Document Mining Tool For Investigative Journalists. IEEE Trans. Visualization and Computer Graphics (Proc. InfoVis 2014), 20(12):2271-2280, 2014.

J31: **Stephen Ingram** and Tamara Munzner. Dimensionality Reduction for Documents with Nearest Neighbor Queries. Neurocomputing (Special Issue for Workshop on Visual Analytics using Multidimensional Projections (VAMP) held at EuroVis 2013), Volume 150 Part B, p 557-569, 2015.

J30: **Miriah Meyer**, **Michael Sedlmair**, and Tamara Munzner. The Nested Blocks and Guidelines Model. Information Visualization, 14(3) 2015. [30% new material beyond C22]

J29. **Michael Sedlmair**, Tamara Munzner, and Melanie Tory. Empirical Guidance on Scatterplot and Dimension Reduction Technique Choices. IEEE Trans. Visualization and Computer Graphics (Proc. InfoVis 2013), 19(12): 2634-2643, 2013.

- J28. **Matthew Brehmer** and Tamara Munzner. A Multi-Level Typology of Abstract Visualization Tasks. *IEEE Trans. Visualization and Computer Graphics (Proc. InfoVis 2013)*, 19(12): 2376-2385, 2013. (122 cites)
- J27. **Joel A. Ferstaj**, Cydney B. Nielsen, and Tamara Munzner. Variant View: Visualizing Sequence Variants in their Gene Context. *IEEE Trans. Visualization and Computer Graphics (Proc. InfoVis 2013)*, 19(12): 2546-2555, 2013.
- J26. **Michael Sedlmair**, **Miriah Meyer**, and Tamara Munzner. Design Study Methodology: Reflections from the Trenches and the Stacks. *IEEE Trans. Visualization and Computer Graphics (Proc. InfoVis 2012)*, 18(12):2431-2440, 2012. **Honorable Mention for Best Paper Award.** (200 cites)
- J25. **Michael Sedlmair**, Annika Frank, Tamara Munzner, and Andreas Butz. ReEx: Visualization for Actively Changing Overlay Network Specifications. *IEEE Trans. Visualization and Computer Graphics (Proc. InfoVis 2012)*, 18(12):2729-2738, 2012.
- J24. **Michael Sedlmair**, Andrada Tatu, Tamara Munzner, and Melanie Tory. A Taxonomy of Visual Cluster Separation Factors. *Computer Graphics Forum (Proc. EuroVis 2012)*, 31(3):1335-1344, 2012.
- J23. Maryam Booshehrian, Torsten Möller, Randall M. Peterman, and Tamara Munzner. Vismon: Facilitating Analysis of Trade-Offs, Uncertainty, and Sensitivity In Fisheries Management Decision Making. *Computer Graphics Forum (Proc. EuroVis 2012)*, 31(3):1235-1244, 2012. **Runner Up for Best Paper Award (Second Best Paper).**
- J22. **Miriah Meyer**, Tamara Munzner, Angela DePace and Hanspeter Pfister. MulteeSum: A Tool for Comparative Temporal Gene Expression and Spatial Data. *IEEE Trans. Visualization and Computer Graphics (Proc. InfoVis 2010)* 16(6):908-917, 2010.
- J21. **Daniel Archambault**, Tamara Munzner, and David Auber. Tugging Graphs Faster: Efficiently Modifying Path-Preserving Hierarchies for Browsing Paths. *IEEE Trans. Visualization and Computer Graphics* 17(3):276-289, 2011. [30% new material beyond C18], **invited as a best paper from IEEE PacificVis 2010**.
- J20. **Miriah Meyer**, Bang Wong, Tamara Munzner, Mark Styczynski and Hanspeter Pfister. Pathline: A Tool for Comparative Functional Genomics. *Computer Graphics Forum (Proc. EuroVis 2010)*, 29(3):1043-1052, 2010.
- J19. Tamara Munzner. A Nested Model for Visualization Design and Validation. *IEEE Trans. Visualization and Computer Graphics (Proc. InfoVis 09)*, 15(6):921-928, 2009. (334 cites)
- J18. **Miriah Meyer**, Tamara Munzner and Hanspeter Pfister. MizBee: A Multiscale Synteny Browser. *IEEE Trans. Visualization and Computer Graphics (Proc. InfoVis 09)*, 15(6):897-904, 2009. **Honorable Mention for Best Paper Award.** (110 cites)
- J17. **Stephen Ingram**, Tamara Munzner, and Marc Olano. Glimmer: Multilevel MDS on the GPU. *IEEE Trans. Visualization and Computer Graphics*, 15(2):249-261, Mar/Apr 2009. (138 cites)
- J16. David J Lynn, Geoffrey L Winsor, Calvin Chan, Nicolas Richard, Matthew R Laird, **Aaron Barsky**, Jennifer L Gardy, Fiona M Roche, Timothy H W Chan, Naisha Shah, Raymond Lo, Misbah Naseer, Jaimmie Que, Melissa Yau, Michael Acab, Dan Tulpan, Matthew D Whiteside, Avinash Chikatamarla, Bernadette Mah, Tamara Munzner, Karsten Hokamp, Robert E W Hancock, and Fiona S L Brinkman. InnateDB: facilitating systems-level analyses of the mammalian innate immune response. *Molecular Systems Biology* 4:218 2008. (266 cites)
- J15. **Aaron Barsky**, Tamara Munzner, Jennifer L. Gardy, and Robert Kincaid. Cerebral: Visualizing Multiple Experimental Conditions on a Graph with Biological Context. *IEEE Trans. Visualization and Computer Graphics (Proc. InfoVis 2008)* 14(6):1253-1260, 2008.
- J14. **Daniel Archambault**, Tamara Munzner, and David Auber. GrouseFlocks: Steerable Exploration of Graph Hierarchy Space. *IEEE Trans. Visualization and Computer Graphics*, 14(4):900-913, 2008. (113 cites)

J13. **Melanie Tory**, David W. Sprague, Fuqu Wu, Wing Yan So, and Tamara Munzner. Spatialization Design: Comparing Points and Landscapes. *IEEE Trans. Visualization and Computer Graphics (Proc. InfoVis 2007)* 13(6):1262-1269, 2007.

J12. **Heidi Lam**, Robert Kincaid, and Tamara Munzner. Overview Use in Multiple Visual Information Resolution Interfaces. *IEEE Trans. Visualization and Computer Graphics (Proc. InfoVis 2007)* 13(6):1278-1285, 2007.

J11. **Aaron Barsky**, Jennifer L. Gardy, Robert E.W. Hancock, and Tamara Munzner. Cerebral: a Cytoscape plugin for layout of and interaction with biological networks using subcellular localization annotation. *Bioinformatics Journal* 23(8):1040-1042, 2007. (148 cites)

J10. **Dan Archambault**, Tamara Munzner, and David Auber. TopoLayout: Multi-Level Graph Layout by Topological Features. *IEEE Trans. Visualization and Computer Graphics*, 13(2):305-317, 2007. (147 cites)

J9. **Dan Archambault**, Tamara Munzner, and David Auber. Smashing Peacocks Further: Drawing Quasi-Trees from Biconnected Components. *IEEE Trans. Visualization and Computer Graphics (Proc. InfoVis 2006)*, 12(5):813-820, 2006.

J8. **James Slack** and Tamara Munzner. Composite Rectilinear Deformation for Stretch and Squish Navigation. *IEEE Trans. Visualization and Computer Graphics (Proc. Vis 2006)*, 12(5):901-908, 2006.

J7. Robert Moorhead, Chris Johnson, Tamara Munzner, Hanspeter Pfister, Penny Rheingans, and Terry S. Yoo. Visualization Research Challenges: A Report Summary. *IEEE Computing in Science & Engineering* 8(4):66-73 (July / Aug) 2006. [summary of B1, similar in content to J6]

J6. Tamara Munzner, Chris Johnson, Robert Moorhead, Hanspeter Pfister, Penny Rheingans, and Terry S. Yoo. NIH/NSF Visualization Research Challenges Report Summary. *IEEE Computer Graphics and Applications*, 26(2):20-24 (March / April) 2006. [summary of B1]

J5. **James Slack**, **Kristian Hildebrand**, and Tamara Munzner. PRISAD: Partitioned Rendering Infrastructure for Scalable Accordion Drawing (Extended Version). *Information Visualization*, 5(2):137-151, 2006. [30% new material beyond C11], **invited as a best paper from IEEE Visualization 2005**

J4. Tamara Munzner, Francois Guimbretiere, Serdar Tasiran, Li Zhang, Yunhong Zhou. TreeJuxtaposer: Scalable Tree Comparison using Focus+Context with Guaranteed Visibility. *ACM Trans. on Graphics (Proc. SIGGRAPH 2003)* 22(3):453-462, 2003. (327 cites)

J3. Kirsten Ridsen, Mary P. Czerwinski, Tamara Munzner, Daniel B. Cook. An initial examination of ease of use for 2D and 3D information visualizations of web content, *International Journal of Human Computer Studies*, 53(5):695-714, Academic Press, November 2000. (137 cites)

J2. Tamara Munzner. Exploring Large Graphs in 3D Hyperbolic Space, *IEEE Computer Graphics and Applications*, 18(4):18-23, July / August 1998. [summary of C3 and C4] (211 cites)

J1. Andrew J. Hanson, Tamara Munzner, and George Francis. Interactive Methods for Visualizable Geometry. *IEEE Computer*, 27(4):73-83, July 1994.

(b) *Conference Proceedings*

C24: **Anamaria Crisan**, Jennifer Gardy, and Tamara Munzner. On Regulatory and Organizational Constraints in Visualization Design and Evaluation. Proc. Workshop on BEyond time and errors: novel evaluation methods for Information Visualization (BELIV), 2016. (N/A acceptance rate)

C23: **Matt Brehmer**, **Michael Sedlmair**, **Stephen Ingram**, and Tamara Munzner. Visualizing Dimensionally-Reduced Data: Interviews with Analysts and a Characterization of Task Sequences. Proc. Workshop on BEyond time and errors: novel evaluation methods for Information Visualization (BELIV), 2014. (N/A acceptance rate)

C22: **Miriah Meyer, Michael Sedlmair**, and Tamara Munzner. The Four-Level Nested Model Revisited: Blocks and Guidelines. *Proc. Workshop on BEyond time and errors: novel evaluation methods for Information Visualization (BELIV)*, 2012. (N/A acceptance rate)

C21. **Stephen Ingram** and Tamara Munzner. Glint: An MDS Framework for Costly Distance Functions. *Proc. Swedish Chapter of Eurographics (SIGRAD) 2012*, pages 29–38 (N/A acceptance rate).

C20. Syavash Nobarany, Louise Oram, Vasanth Kumar Rajendran, Chi-Hsiang Chen, Joanna McGrenere, Tamara Munzner. The Design Space of Opinion Measurement Interfaces: Exploring Recall Support for Rating and Ranking. *Proc. ACM Conference on Human Factors in Computing Systems (CHI) 2012*, pages 2035–2044.

C19. **Stephen Ingram**, Tamara Munzner, Veronika Irvine, Melanie Tory, Steven Bergner, and Torsten Möller. DimStiller: Workflows for dimensional analysis and reduction. *Proc. IEEE Conference on Visual Analytics Software and Technologies (VAST) 2010*, October 24–26 2010, pages 3–10. (28% acceptance rate)

C18. **Daniel Archambault**, Tamara Munzner, and David Auber. TugGraph: Path-Preserving Hierarchies for Browsing Proximity and Paths in Graphs. *Proc. IEEE Pacific Visualization Symposium (PacificVis) 2009*, April 20–23 2009, pages 113–121. (39% acceptance rate)

C17. **Heidi Lam** and Tamara Munzner. Increasing the Utility of Quantitative Empirical Studies for Meta-analysis. *Proc. ACM CHI Workshop on BEyond time and errors: novel evaluation methods for Information Visualization (BELIV) 2008*, April 5 2008, pages 21–27. (N/A acceptance rate)

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## 15. NON-REFEREED PUBLICATIONS

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## 16. BOOKS

### (a) Authored

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### (b) Edited

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### (c) Chapters

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D2. Tamara Munzner. Visualization. Chapter 27, p 675-707, of *Fundamentals of Graphics, Third Edition*. by Peter Shirley and Steve Marschner, with additional contributions by Michael Ashikhmin, Michael Gleicher, Naty Hoffman, Garrett Johnson, Tamara Munzner, Erik Reinhard, Kelvin Sung, William B. Thompson, Peter Willemsen, Brian Wyvill. AK Peters, 2009.

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## 17. PATENTS

## 18. SPECIAL COPYRIGHTS

Outside In was shown in excerpt at the SIGGRAPH 94 Electronic Theater and won prizes at Nicograph, Prix Ars Electronica, Prix Pixel Imagina, and the London Effects and Animation Festival. The Shape of Space was shown in excerpt at the SIGGRAPH 95 Electronic Theater and Prix Pixel Imagina.

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V1. Silvio Levy, Delle Maxwell, and Tamara Munzner. Outside In [video, 22 minutes]. Producer: The Geometry Center. AK Peters, 1994.

## 19. OTHER WORKS

(a) *Software released publicly arising from my research*

S22. **TimeLineCurator**. (with **Johanna Fulda** and **Matt Brehmer**; 2015) Authoring tool for journalists and others to create timeline from free-form text. Open source.

S21. **APQ and QSNE**. (with **Stephen Ingram**; 2014) All-Pairs Query, or APQ, nearest-neighbor algorithm and the Q-SNE, dimensionality reduction algorithm. Open source.

S20. **Overview**. (with **Stephen Ingram**, **Jonathan Stray**, **Jonas Karlsson**, and **Adam Hooper**; 2012-2013) Visualization and analysis tool for large sets of documents, intended to support investigative journalism. Open source.

S19. **Variant View**. (with **Joel Ferstay** and **Cydney Nielsen**; 2013) Visual analysis tool genomic sequence variant analysis. Open source.

S18. **Vismon**. (with **Maryam Booshehrian** and **Torsten Moeller**; 2012) Visual analysis tool for fisheries simulation data, including sensitivity analysis, global trade-offs analysis, and staged uncertainty. Open source.

S17. **DimStiller**. (with **Stephen Ingram**; 2010) Visualization system for dimensional analysis and reduction, providing guidance for middle-ground users. Open source.

S16. **MulteeSum** (with **Miriah Meyer**; 2010) Exploration tool that supports the comparison of multiple gene expression data sets defined both spatially and temporally. Open source.

S15. **Pathline**. (with **Miriah Meyer**; 2010) Tool that visualizes temporal gene expression data over multiple molecular pathways and across multiple species. Open source.

S14. **Mizbee**. (with **Miriah Meyer**; 2009) Browser that enables analysis of comparative genomics data through visualization across multiple scales. Open source.

S13. **Glimmer**. (with **Stephen Ingram**; 2008) GPU and CPU versions of fast and robust multilevel multidimensional scaling algorithm. Open source.

S12. **GrouseFlocks, Grouse**. (with **Daniel Archambault**; 2008) Multilevel graph hierarchy exploration tools, built on the Tulip framework. Open source.

S11. **SPF**. (with **Daniel Archambault**; 2008) Smashing Peacocks Further quasi-tree graph layout, built on Tulip and TopoLayout. Open source.

S10. **TopoLayout**. (with **Daniel Archambault**; 2008) Feature-based multilevel graph layout, built on the Tulip framework by David Auber. Open source.

S9. **Cerebral**. (with **Aaron Barsky**; 2008) Cytoscape plugin for compartmentalized network layout, for instance using subcellular localization annotations, and comparing quantitative data from multiple experiments. Open source.

S8. **SequenceJuxtaposer**. (with **James Slack**, **Kristian Hildebrand**; 2005) Visualization software for browsing and comparing gene sequences. Open source.

S7. **TreeJuxtaposer**. (with **James Slack**, **Kristian Hildebrand**, **Francois Guimbretiere**, **Li Zhang**, **Yunhung Zhou**; 2003) Visualization software for browsing and comparing large trees, especially phylogenetic or taxonomic trees. InfoVis 2004 contest overall winner. Open source.

S6. **HypViewer**. (1997) The 3D hyperbolic module used in Site Manager below, in library form. Source released for free noncommercial use.

S5. **Site Manager**. (with **Alan Braverman** and **Greg Ferguson**; 1997) Free software from Silicon Graphics for webmasters and content creators, with a 3D hyperbolic view of the link structure of the target web site using layout from InfoVis97 paper and guaranteed frame rate drawing algorithm from Graph Drawing 98 paper. Binary release bundled with Irix 6.5.

**S4. Caidants.** (with Eric Hoffman; 1996) The CAIDA toolset for network drawing, used to create a series of short videos including Planet Multicast and autogenerated web pages. Open source.

**S3. WebOOGL.** (1994) Proof of concept implementation of integrating 3D graphics with the web. Runner-up proposal for VRML 1.0 standard, the vote was won by SGI's Inventor-based proposal. Open source.

**S2. Triangle Tiling.** (with Charlie Gunn, Stuart Levy, and Olaf Holt; 1994.) Museum exhibit on display at the Science Museum of Minnesota for several years, allowed visitors to explore the connections between symmetry groups, tiling, duality, the Platonic and Archimedean solids, and non-Euclidean geometry through interactive 3D graphics. Open source.

**S1. Geomview.** (with Stuart Levy and Mark Phillips; 1992) 3D interactive visualization package with over one thousand registered users at its peak, includes support for non-Euclidean and higher-dimensional geometry. Open source.