BRIAN D. FISHER, PH.D.

http://www.siat.sfu.ca/faculty/Brian-Fisher/

Positions

Associate Professor (2004-) School of Interactive Arts & Technology and Program in Cognitive Science, Simon Fraser University

Associate Director (1999-) University of British Columbia Media and Graphics Interdisciplinary Centre

Associate Director (1994-1998) Simon Fraser U. Institute for Human Factors & Interface Technology

Research Associate (1996-1998) Telelearning Network of Centres of Excellence, Simon Fraser U

Research Professor (1994) Rutgers U. Center for Cognitive Science (RuCCS)

Postdoc (1991-1993) Institute for Robotics and Intelligent Systems I, U. of Western Ontario

Education

Ph.D. Experimental Psychology 1991, University of California at Santa Cruz

B.A. in Biology (Physiology/Biochemistry) 1979, Hiram College

Courses taught

Cognition, Learning, and Collaboration (IAT 812)

Quantitative Research Methods and Strategies (IAT 802)

Interaction Science (IAT 855, with John Dill)

Managing Visual Analytics Applications (IAT 481 with Ginger Grant, SFU Business School)

Cognition in the Design of Interactive Systems (IAT 302)

Usability in Interactive Environments (SFU IAT 201)

Cognition in Design Science (SFU IAT 200)

Implementing e-Business in the Organization (UBC BAIT 513)

Preparing the Business Plan (UBC BAEN 504, with Tarrnie Williams)

Entrepreneurship (UBC BAEN 500 with Tarrnie Williams)

Human Computer Interaction (UBC CPSC 444)

Human-Computer Interaction in Engineering Design (UBC ECE 418, with Sid Fels)

Human Machine and Human Computer Interaction (SFU KIN 383, with Tom Calvert)

Institutional service

Chair, Communications Committee 2008-2009

Director's Committee 2008-2009

Tenure and Promotion Committee 2008-2009

Hiring Committee 2005-2006

Graduate Program Committee 2005-2008, Subcommittee on Visual Analytics 2008-2009

Graduate Admissions Committee 2006-2009

Grant proposals under review

VACCINE: Visual Analytics for Command, Control, Interoperability, National Security and Emergencies. US Department of Homeland Security Centers of Excellence program. $18M/6yrs, 16 universities. I am one of 4 Area PIs, directing the Cognition theme. My lab contributes to: Interactive Visual Analysis and Decision Making Environments; Dissemination, Mobile and Lightweight Analytics Command Control and Interpretability; In-Field Criminal Investigation Analytics; Video Surveillance Visual Analytics for School, Event, and Border Security; and Visual Analytics for Investigative Analysis on Text Documents.

Deriving and Applying Cognitive Principles for Human/Computer Approaches to Complex Analytical Problems. US Department of Homeland Security International Program. $200K/1yr. This is a joint application with U. North Carolina at Charlotte (Bill Ribarsky). I am PI for the Canadian side of this examination of perceptual and enactive cognition in mixed-initiative visual analytics using financial analysis as a target domain.

Research and Training Program in Visual Analytics (Training grant). Natural Sciences and Engineering Research Council of Canada Collaborative Research and Training Experience Program $1.6M/6 yrs. I am PI for this support for a new graduate program offered at SFU's School of Interactive Arts and Technology, Department of Statistics and Actuarial Science, and Faculty of Business Administration with UBC's Media and Graphics Interdisciplinary Centre and School of Library, Archival, and Information Sciences and the Network of Centres of Excellence in Mathematics of Information Technology and Complex Systems (MITACS).

Current grants and contracts

Boeing Support for Visual Analytics in Canada. 3 investigators, $1.33M/5 yrs cash, equivalent in-kind contribution of software, data, and consulting, Shared between SFU and UBC MAGIC, 50% to SFU. Funds have been allocated by Boeing and approved by UBC, pending final approval for qualification for IRB offsets by Industry Canada and SFU. These funds are eligible for NSERC CR&D matching.

Information systems for skilled cognition & communication NSERC Discovery Research Grant, $96k/5 yrs. I am sole investigator on this examination of perceptual and enactive cognition that will inform the design of highly interactive computer software to support human communication, understanding and decision making.

Visual Analytics for Safety & Security NSERC Strategic, 2007-2009, $459k. I am principal investigator of this project to advance the underlying cognitive science of visual analytics to build user models and design and testing methods that address individual and collaborative perception, cognition, and action in ways that are precise, diagnostic, user-centred and geared towards expert users. Applications focus on safety and security.

External collaborations

Kaleidoscope (co-investigator) EU 6th Framework Program.

Pacific Regional Visual Analytics Centre (co-investigator w. Thomas Furness) 2006-2009, $1.5m USD

Purdue Regional Visual Analytics Centre (external collaborator, David Ebert PI) 2006-2009, $3m USD

Recent contracts and grants

HOT Admin: Human Organization & Technology Improvement of Security Administration (co-investigator w. Konstantin Beznosov) NSERC Strategic, 2006-2008, $459k

Visual Analytics – Science and Application Peter Wall Institute for Advanced Research Exploratory Workshop Grant, $18,340, additional support from CDRN, NRC_IRAP and internal funds totaled $50,000.

The Power of the Arts – BC Portfolio Requirements (co-investigator w. Judy Dallas) Inukshuk Fund, $80k

SFU Wendy McDonald Endowed Research Fellowship (sole investigator), $5k

Information System Design for Human Cognition and Communication. (sole investigator) NSERC Operating Grant, $68k

Closing the Loop in Immersive CAD (principal investigator) BC Advanced Systems Institute Industrial Partnership Program and General Motors of Canada. GM/ASI $67k

New Media Collaboration Studies Network (co-investigator w. Sara Diamond) SSHRC Network grant, $50k

BEST- Banc d'Essai de Services de liaisons optiques pour un environnement de Téléformation doctorale (co-investigator w. Jacqueline Bourdeau) CANARIE contribution $499,951, total $999,902.

Flow Keeper Research contract (co-investigator w. Sidney Fels) Nissan Motor Company, $100k

Smart Seat Research contract (co-investigator w. Sidney Fels) Nissan Motor Company, $100k

Collaborative Visualization for Time & Safety-critical Situations. (co-investigator w. Kellogg Booth, 352k

Telelearning Network of Centres of Excellence Project 3.3 Systems Models: Architectures, Workstations, Interfaces, Multimedia Tools and Adaptive Learning Systems and Project 5.3 Design and Evaluation of User Interfaces for Knowledge Building and Collaborative Learning. (co-investigator with Linda Harasim and Tom Calvert P.I.s) $15M

Other affiliations

Honourary Associate Professor, MAGIC University of British Columbia (2008-present)

Adjunct Professor, Computer Science University of British Columbia (2000- 2008)

Associated Faculty, Psychology University of British Columbia (2000- present)

Adjunct Professor, Strategy and Business Economics University of British Columbia (2000-2003)

Adjunct Professor, Kinesiology Simon Fraser University (1996-2003)

Investigator, UBC Brain Research Centre (1999-present)

Associate, UBC Institute for Computing, Intelligent and Cognitive Systems: (2001-present)

Service to academic community

Advisory Committee, Scientific Evaluation Methods for Visual Analytics Science and Technology (NSF Collaboration Project)

VAST representative IEEE Visualization Week Doctoral Colloquium 2009

Area chair for Cognitive and Perceptual Science, Visual Analytics Science and Technology 2006, 2007

Co-organizer, 2007 Peter Wall Institute Workshop on Visual Analytics – Science and Application

Organizer, 2007 Cognitive Science Society Symposium on Cognitive Science in the Design of Graphical Images and Interfaces

Chair, 6th International Symposium on. Smart Graphics 2006

Conference committee, International Symposium on. Smart Graphics 2003-2005

Conference committee, BCNet 2003-2005

Program committee, ED-MEDIA --World Conference on Educational Multimedia, Hypermedia & Telecommunications 1999-2005

Program committee, IEEE Symposium on Information Visualization 2002, 2003

Cognitive Science Society Conference committee, Invited Symposia Subcommittee, and Tutorial and Workshop Planning Subcommittee 1999

Board member New Ventures BC Association (business plan competition, $60, 000 prize)

UBC Faculty of Commerce Bureau for e-Business Research. 2000-2003

Constraintworks Inc. Advisory Board (2001-2003)

ThoughtShare Communications Inc. Advisory Board (2000-2003)

Deutsche Forschungsgemeinschaft (DFG) 2008 Review Panel "Scalable Visual Analytics" priority programme

Information, Communications & Emergent Technologies (2008) reviewer, Science Foundation Ireland

Site Review Panel, Natural Sciences and Engineering Research Council of Canada (Industrial Chair Program)

Grant reviewer for Natural Sciences and Engineering Research Council of Canada, Hampton Foundation, Social Sciences and Engineering Research Council of Canada

Reviewer for ACM CHI, IEEE Infovis, Cogsci, Computer Graphics and Applications, New Interfaces for Musical Expression, Graphics Interface, EuroCogsci, ICEC, Eurographics, Transactions on Applied Perception, International Conference on Advanced Learning Technologies, International Conference on Information & Communication Technologies, International Journal of Human-Computer Studies, User Interface Software and Technology, Computational Intelligence, Psychological Science, Computational Aesthetics, Applied Perception in Graphics and Visualization.

Membership and awards

Member IEEE Computer Society, ACM, SIGCHI, SIGGRAPH, Cognitive Science Society

Research Associate Award, U.S. National Research Council 1991 (NASA Ames Spatial Displays Group).

Outstanding teaching award, University of California, 1991

Books and monographs

Contribution to “The Science of Analytical Reasoning: Perception and Cognition”. In J. Thomas & K. A. Cook (Eds.), *Illuminating the Path-- Research and Development Agenda for Visual Analytics*: IEEE Press.

Butz, A. Fisher, B.; Krüger, A.; Olivier, P. (Eds.) (2008). Lecture Notes in Computer Science: Smart graphics 8th international symposium,, Springer-Verlag, Berlin, Heidelberg, New York.

Butz, A. Fisher, B.; Krüger, A.; Olivier, P. (Eds.) (2007). Lecture Notes in Computer Science: Smart graphics 7th international symposium,, Springer-Verlag, Berlin, Heidelberg, New York.

Butz, A. Fisher, B.; Krüger, A.; Olivier, P. (Eds.) (2006). Lecture Notes in Computer Science: Smart graphics : 6th international symposium,, Springer-Verlag, Berlin ,Heidelberg, New York.

Butz, A. Fisher, B.; Krüger, A.; Olivier, P. (Eds.) (2005). Lecture Notes in Computer Science: Smart graphics : 5th international symposium,, Springer-Verlag, Berlin, Heidelberg, New York

Fisher, Fels, MacLean, Munzner, and Rensink (2004) Seeing, Hearing, and Touching: Putting it All Together. SIGGRAPH Course Notes, (ACM Digital Library, monograph and DVD available), SIGGRAPH 2004, Los Angeles.

Fels, Fisher, MacLean, Munzner, and Rensink ((2003) Design of interactive multimodal media systems: Intersensory interactions and HCI. SIGGRAPH Course Notes, (ACM Digital Library, monograph and DVD available)

Booth, Fels, Fisher, MacLean, Rensink (2002) Design of interactive multimodal media systems: Intersensory interactions and HCI. SIGGRAPH Course Notes, (ACM Digital Library, monograph and DVD available)

Refereed publications (student authors in boldface)

Book Chapter (expanded conference paper)

Fisher, B.D., **Agelidis, M**., Dill, J., **Tan, P., Collaud, G.**, & Jones, C. (1997). CZWeb: Fish-eye views for visualizing the World Wide Web. In M.J. Smith, G. Salvendy & R. J. Koubek *Design of Computing Systems: Social and Ergonomic Considerations: Volume 2, Advances in Human Factors/Ergonomics, 21B*, pp 719-722, Amsterdam: Elsevier.

Journal Articles

Fisher, B. Science and Smart Graphics. (in press) Information Technology.

Green, T.M., Ribarsky, W. & Fisher, B. (2009). "Building and applying a human cognition model for visual analytics," Information Visualization 8(1).

Franconeri, S. L., Lin, J. Y., Pylyshyn, Z. W., Fisher, B., Enns, J.T. (in press) Evidence against a speed limit in multiple-object tracking. Psychonomic Bulletin & Review

Liu, G. Austen, E. L., Booth, K.S. Fisher, B., **Argue, R. Rempel, M.I.**, & Enns, J. (2005) Multiple Object Tracking Is Based On Scene, Not Retinal, Coordinates. Journal of Experimental Psychology: Human Perception and Performance. 31(2), Apr 2005, 235-247.

Po, B. Fisher, B. Booth, K. (2005) A Two Visual Systems Approach to Understanding Voice and Gestural Interaction. Virtual Reality (Special Issue on Language, Speech, and Gesture) 8, pg. 231-241.

Schmidt, W.C.; Fisher,-B.D.; Pylshyn,-W. (1998). Multiple-location access in vision: Evidence from illusory line motion. Journal-of-Experimental-Psychology:-Human-Perception-and-Performance.24(2): 505-525.

Fisher B.D., & Pylyshyn, Z. W. (1994). The cognitive architecture of bimodal event perception: A commentary and addendum to Radeau. *Current Psychology of Cognition 13:1*, 92-96.

Pylyshyn, Z., **Burkell, J.,** Fisher, B., **Sears, C., Schmidt, W., & Trick, L.** (1993). Multiple parallel access in visual attention. *Canadian Journal of Experimental Psychology 48:2*, 260-283

Macknik, S. L., Fisher, B. D., & Bridgeman, B. (1991). Flicker distorts visual space constancy. *Vision Research. 31:12*, 2057-2064

Bridgeman, B., & Fisher, B. D. (1990). Saccadic suppression of displacement is strongest in central vision., *Perception, 19,* 103 - 111.

Archival Proceedings

Haraty, M., Nobarany, S., DiPaola, S. Fisher, B. (2009) AdWiL: Adaptive Windows Layout Manager. CHI 2009 Works-in-Progress.

Jeong, D. H., Ziemkiewicz, C., Fisher, B., Ribarsky, W. , Chang, R. (2009). Effectiveness of Interactions in PCA-based Visual Analytics. Computer Graphics Forum (Eurovis).

Green, T. M., Ribarsky, W., Fisher, B. (2008) Visual Analytics for Complex Concepts Using a Human Cognition Model. IEEE Visual Analytics Science and Technology. Columbus, OH.

Fisher, B., Ebert, D., Gray, W. Hegarty, M, Rensink, R. (2008) Panel: The interdisciplinary science of visual analytics. IEEE Visual Analytics Science and Technology. Columbus, OH.

Botta, D. , Werlinger, R., Gagne, A., Beznosov, K., Iverson, L., Fisher, B., & Fels, S. (2007) Towards Understanding IT Security Professionals and Their Tools. CM International Conference Proceeding Series; Vol. 229 archive. Proceedings of the 3rd symposium on Usable privacy and security table of contents. Pittsburgh, Pennsylvania pg: 100 - 111

Po, B. Fisher, B. Booth, K. (2005) Comparing Cursor Orientations for Mouse, Pointer, and Pen Interaction. CHI 2005 (full paper) pg: 291 - 300.

Lam, H., Fisher, B. & Dill, J. (2005) A Pilot Study of CZTalk: A Graphical Tool for Collaborative Knowledge Work.. HICSS '05. Proceedings of the 38th Annual Hawaii International Conference on System Sciences. IEEE Digital Library

Swindells, C., Po, B.A., Hajshirmohammadi, I., Corrie, B., Dill, J.C., Fisher, B.D. & Booth, K.S. (2004). Comparing CAVE, wall, and desktop displays for navigation and wayfinding in complex 3D models. In Proceedings of CGI 2004 (Computer Graphics International), Hersonissos, Crete, Greece, June 16-19, pp. 420-427.

Po, B., Fisher, B. Booth, K. (2004) Mouse and Touchscreen Selection in the Upper and Lower Visual Fields. CHI 2004 (full paper), pg;359 - 366 .

Po, B., Fisher, B., & Booth K. S. (2003) Pointing and Visual Feedback for Spatial Interaction in Large-Screen Display Environments. In Springer Lecture Notes in Computer Science " Smart Graphics 2003" Heidelberg, Germany. Butz, A., Krüger, A., Olivier, P., Lexicle Ltd, York, UK (Eds.)

Ihara, M., Kobayashi, M., and Fisher, B. (2003) Visualizing Meeting States for a Smooth Online Discussion. Graphics Interface. Dalhousie University Halifax, NS

Booth, K.S., Fisher, B. **Lin, C. J., Argue, R.** (2002). "The 'Mighty Mouse' Multi-Screen Collaboration Tool" UIST 2002, Paris.

Harrison, J., Booth K. S., Fisher, B. (2002) Experimental Investigation of Linguistic and Parametric Descriptions of Human Motion for Animation Proceedings of Computer Graphics International 2002, 1-5 July, Bradford, UK.

Other proceedings and abstracts

Fisher, B., Paley, B. W., Pylyshyn, Z.W., Rensink, R.A., Tversky, B. (2007) Symposium on Cognitive Science in the Design of Graphical Images and Interfaces. Cognitive Science Society, Nashville. TN.

Botta, D., Beznosov, K., Iverson, l., Fisher, B., Fels, S., **Werlinger, R.** (2007) Studying IT Security Professionals: Research Design and Lessons Learned. Security User Studies Workshop, CHI 2007, San Jose CA.

Fisher, B. and Dill, J. (2006) New Techniques for Studying Information Visualization and Interaction. Workshop on Information Visualization and Interaction Techniques for Collaboration Across Multiple Displays, CHI 2006, Montreal.

Kaastra, L. T., & Fisher, B. (2006). Affording virtuosity: HCI in the lifeworld of collaboration. *About Face:Interface Creative Engagement in the New Media Arts and HCI* (CHI Workshop). Montreal. QC.

Sillito, J. de Volder, K., Fisher, B., Murphy, G. (2005) Management of Change Tasks: An Exploratory Study. IEEE 4th International Conference on Empirical Software Engineering. Noosa Head Australia.

Gauthier, J., Fisher, B., Klawe, M. (2003) Peer Presence and Real-Time Assessment: A Symbiotic Relationship. EdMedia 2003, Honolulu, HI.

Carpenter, L., Fisher, B., May, R. L., Streitz, N. Kasik, D. Graphics in the Large (Panel) SIGGRAPH 2002

Fisher, B. (2002). Cognitive Science and the Design of Learning Technologies. *American Educational Research Association* New Orleans, LA

Fisher, B. (2002). Interaction Design Education at UBC. ACM SIGCHI Interactions Special Issue on Design IX. 2, March. Pp 33-36

Lam, H., Fisher, B. Dill, J. (2002) CZTalk: a Graphical Tool for Online Discussion. Western Computer Graphics Symposium. Silver Star, B.C.

Giroux, P. and Fisher, B. (2002) FINST spatial indexing theory and its application to guidelines for knowledge representation in e-learning. E-Learn, Montreal QC

Austen, E., Liu, G., Stevenson, A., Booth, K. S., Dill, J., Enns, J. T., Fisher, B., MacLean, K., & Rensink, R. (2001, June). Perceptual cognitive design: Safe changes to air traffic control. Poster presented at the Proceedings of Graphic Interface, Ottawa, ON.

Fisher, B. and Dill, J. (2000). Application of Theories of Indexical Cognition to a Web-based Workspace. American Association for Artificial Intelligence Symposium on "Smart Graphics", Stanford CA

Fisher, B. D. , Dill, J., and **Liljefors, M.** (1999). Case Study: Perceptual Cognition and the Design of an Air Traffic Control Interface. Information Visualization Workshop, Visualization 1999, San Francisco CA

Brett, P., Fisher, B. D., Sloan, J. Wilson, M. and Wilson, R. (1999). The Reflective Practitioner and the World Wide Web: Seeking a New Approach to Continuing Medical Education. *Adult Educational Research Conference*.

Bakardjieva, M., Campos, M., Fisher, B., **Wang, X. and Xin, M**. (1999). Communication and learning processes on-line: converging evidence from multiple perspectives (Roundtable) *American Educational Research Association*. Montreal, QC

Xin, M. and Fisher, B. D. (1998). Analysis of Learning Environments Using Web Server Logs. *International Conference on Computers in Education*.

Fisher, B.D. (1997). Spatial indexing, sensory integration, and the design of perceptual interfaces. *Workshop on Perceptual Interfaces (UIST)*.

Fisher, B.D., Conway, K., & Groeneboer, C. (1997). Virtual-U Development Plan: Issues and process. *Proceedings, ED-MEDIA and ED-TELECOM*. Calgary AB

Fisher, B.D., **Schmidt, W. A.**, & Pylyshyn, Z.P. (1993). Multiple abrupt onset cues produce illusory line motion. *Investigative Ophthalmology and Visual Science,33:4* 778 (ARVO abstract).

Spivey-Knowlton, M., Fisher, B. D., & Bridgeman, B. (1991). Attention and automaticity: Interaction of two modes of attention. *Investigative Ophthalmology and Visual Science, 32:4,*1040. (ARVO abstract).

Fisher, B., Bridgeman, B., & Biederman, I. (1990). Task differences in visual search: Does attention aid detection? *Investigative Ophthalmology and Visual Science, 31:4,* 563. (ARVO abst.)

Invited tutorials & workshops

Fisher, B. (2008) The New Science of Visual Analytics. Keynote address, Conference of the Association for Software Testing. Toronto, Ontario, Canada, July 14-16, 2008.

Fisher, B. (2008) Visual Analytics in Vancouver: The Western Tide. Peter Wall Institute for Advanced Studies Exploratory Workshop "Visual Analytics - Science and Application. Vancouver Canada, Feb 2-5 2008.

Fisher, B. (2007) Dagstuhl Seminar in Scientific Visualization. Internationales Begegnungs- und Forschungszentrum für Informatik.Schloss Dagstuhl, Saarland, Germany.

Fisher, B., Dill, J. Rensink R. (2007) Building a Visual Analytics Capability in Canada. Presentation and participation on Panel "Canadian Partnership: Power, Borders, Olympics" Andrew Vallerand, Director Centre for Security Science and Defence R&D Canada (Moderator). US National Visualization & Analytics Centers (VAC) Consortium, Richland WA.

Fisher, B and Dill, J. (2007) Visual Analytics: The View from Vancouver. CCISS Workshop on Visual Analytics, Carleton University, Ottawa ON

Fisher, B. (2005) Cognition, Sound and Vision. Bodies in Play: Shaping and Mapping Mobile Applications. Banff New Media Institute Summit.

Smith, R., Fisher, B., Sandin, D. ,Westin S.H. (2005) VR--A Reality Check? (panel) VR 2005, Bonn, Germany

Fisher, B. (2004). Collaborative Tool Design. Participate/Collaborate: Reciprocity, Design and Social Networks. Banff New Media Institute Summit.

Fisher, B. (2004). Collaborative Tool Evaluation. Participate/Collaborate: Reciprocity, Design and Social Networks. Banff New Media Institute Summit.

Fisher, B. (2004). Nouvelles méthodes pour l'évaluation des environnements de simulations et de jeux éducatifs (SAGE). Comment les jeux éducatifs, les simulations et les jeux de simulation favorisent-ils l'apprentissage ? ACFAS 2004, Lettres, arts et sciences humaines.

Fisher, B. (2003). Design of Networked Environments for Cross-Disciplinary Collaboration. Banff New Media Institute Nanotechnology Workshop-- "Carbon vs. Silicon: Thinking Small/Thinking Fast"

Invited Speaker, Smart Graphics 2003, Hamburg, Germany.

Fisher, B. (2002). Bridges II, a Cognitive Science Perspective. Bridges Consortium, Banff New Media Institute Human Centered Interface Project.

Fisher, B. & Booth, K.S. (2002) Perceptual and social cognition aspects of situated displays. Workshop on Public, Community, and Situated Displays. CSCW, New Orleans LA

Fisher, B. (2002). Joint SIGCHI/American Institute for Graphic Arts Forum on Experience Design, CHI 2002, Minneapolis Minnesota (invited speaker, Education Panel).

Fisher, B. (2001). Technology as Dynamic Artifact and Communication Medium. Banff Centre Workshop on Cognitive Armatures and Emotion Architecture, Banff AB.

Fisher, B. (1999). Human-Centred Design . Presentation to the Asian Pacific Economic Cooperation Experts' Meeting on Technology for Learning and Culture, Vancouver

Fisher, B. (1998). New approaches to the design of collaborative learning environments. Workshop on HCI in Telelearning Environments, Telelearning NCE.

Fisher, B. (1995). New Approaches to the Design of User Interfaces to Complex Systems: Applications to Supervisory Control, Multimedia and Telelearning IRIS Design and Human Interfaces Workshop.

Fisher, B. (1992). Sensory fusion and place indexing in cognition and motor behaviour 1992 Design and Human Interfaces Workshop IRIS project B4 Vancouver British Columbia. .