Fraser Anderson

fraser.anderson@autodesk.com
www.fraseranderson.ca
(780) 278 9346

Education

11/2014 – 09/2010 | **PhD in Computing Science**
Thesis: Gesture Learning in Human Computer Interaction
Advisor: Walter F. Bischof
University of Alberta

11/2010 – 09/2008 | **MSc. in Computing Science**
Thesis: Objective Evaluation of Surgical Skill
Advisors: Walter F. Bischof, Pierre Boulanger
University of Alberta

06/2008 – 09/2005 | **BSc. with Specialization in Computing Science with Distinction**
University of Alberta

Research Interests

Human computer interaction, specifically gestural interfaces, gesture learning, and how to leverage and train the human motor system using technology. Making things, and making them usable. Interactions with ubiquitous and pervasive computing.

Publications

Book Chapters

B2 | Annett, M., **Anderson, F.**, Bischof, W. F. Activities and Evaluations for Technology-based Upper Extremity Rehabilitation. Invited Chapter *Virtual Reality Enhanced Robot Systems for Disability Rehabilitation*, In Press.

B1 | **Anderson, F.**, and Bischof, W. F. Augmented Reality Improves Myoelectric Prosthesis Training, *Virtual Reality: Rehabilitation in Motor, Cognitive and Sensorial Disorders*, Nova Science Publishers, Sept 2014, pp. 81-94.

Journal Articles

J4 | Anderson, N. C., **Anderson, F**. Bischof, W. F. and Kingstone, A. A Comparison of Scanpath Comparison Methods. *In the Journal of Behaviour Research Methods*, 2014, pp. 1-16.

J3 | **Anderson, F.,** Birch, D., Boulanger, P., and Bischof, W.F. Sensor Fusion for Laparoscopic Surgery Skill Acquisition. *Journal of Computer Aided Surgery*, 17 (6), 2012, pp. 269-283.

J2 | Annett, M., **Anderson, F.**, and Bischof, W.F. Hands, Tables, and Groups Make Rehabilitation Awesome! *Annual Review of Cybertherapy and Telemedicine*, 8, 2010, pp.3 - 6.

J1 | **Anderson, F.,** Annett, M., and Bischof, W.F. Lean on Wii: Physical Rehabilitation with Virtual Reality and Wii Peripherals. *Annual Review of Cybertherapy and Telemedicine*, 8, 2010, pp. 181 - 184.

Conference Publications

C17 | Ramakers, R., **Anderson, F.,** Grossman, T., and Fitzmaurice, G. RetroFab: A Design Tool for Retrofitting Physical Interfaces using Actuators, Sensors and 3D Printing. In *Proceedings of ACM SIGCHI Conference on Human Factors in Computing Systems (CHI)*, 2016, to appear.

C16 | Ens, B., Grossman, T., **Anderson, F.,** Matejka, J., and Fitzmaurice, G. Candid Interaction: Revealing Hidden Mobile and Wearable Computing Activities. In *Proceedings of User Interfaces and Software Technology (UIST)*, 2015, pp. 467-476.

C15 | **Anderson, F.**, Grossman, T., Wigdor, D. and Fitzmaurice, G. Deceptive Devices for Illusory Interactions. In *Proceedings of ACM SIGCHI Conference on Human Factors in Computing Systems (CHI) 2015.* ***** Honorable Mention

C14 | Matejka, J., **Anderson, F.**, and Fitzmaurice, G. Dynamic Opacity Optimization for Scatter Plots. In *Proceedings of ACM SIGCHI Conference on Human Factors in Computing Systems (CHI)* 2015. ***** Honorable Mention

C13 | Annett, M., **Anderson, F.,** Bischof, W.F., and Gupta, A. The Pen is Mightier: Analyzing Tablet and Stylus Behaviours During Inking. In *Graphics Interface (GI) 2014.*

C12 | **Anderson, F.,** Grossman, T., Matejka, J., and Fitzmaurice, G. YouMove: Enhancing Movement Training with an Augmented Reality

Mirror. In *Proceedings of User Interfaces and Software Technology (UIST)*, 2013, pp. 311-320.

C11 Anderson, N.C., **Anderson, F.,** Bischof, W.F., and Kingstone, A. Scanpath Comparison Methods: Compared. In *Proceedings of 17th European Conference on Eye Movements (ECEM)*, 2013.

C10 **Anderson, F.** and Bischof, W.F. Learning and Performance with Gesture Guides. In *Proceedings of the ACM SIGCHI Conference on Human Factors in Computing Systems (CHI)*, 2013, pp. 1109-1118.

C9 🏆 **Anderson, F.,** and Bischof, W.F. Augmented Reality Improves Myoelectric Prosthesis Training. In *Proceedings of the International Conference on Disability, Virtual Reality and Associated Technologies (ICDVRAT)*, 2012, pp. 69-76. *** Best Student Paper Award**

C8 Annett, M., **Anderson, F.,** and Bischof, W.F. User Perspectives on Multi-touch Tabletop Therapy. In *Proceedings of the International Conference on Disability, Virtual Reality and Associated Technologies (ICDVRAT)*, 2012, pp. 255-260.

C7 **Anderson, F.,** Annett, M., and Bischof, W.F. Tabletops in Motion: The Kinetics and Kinematics of Interactive Surface Physical Therapy. In *Proceedings of the ACM SIGCHI Conference on Human Factors in Computing Systems Extended Abstracts (CHI EA)*, 2012, pp. 2351-2356.

C6 **Anderson, F.,** Birch, D.W., Boulanger, P., and Bischof, W.F. Movement Consistency by Optical Tracking Correlates with Surgical Expertise. In *Proceedings of the Annual Meeting of the Society of American Gastrointestinal and Endoscopic Surgeons (SAGES)*, 2011.

C5 **Anderson, F.**, Annett, M., Bischof, W.F., and Boulanger, P. Lean on Wii: Physical Rehabilitation With Virtual Reality and Wii Peripherals. In *Proceedings of CyberTherapy & CyberPsychology*, 2010, pp. 229-234.

C4 Annett, M., **Anderson, F.**, Bischof, W.F., and Boulanger, P. Hands, Tables, and Groups Make Rehabilitation Awesome! In *Proceedings of CyberTherapy & CyberPsychology*, 2010. pp 3-8.

C3 **Anderson, F.**, Annett, M., Bischof, W.F., and Boulanger, P. Virtual Equine Assisted Therapy. In *Proceedings of IEEE Virtual Reality (VR)*, 2010.

C2 Annett, M., **Anderson, F.**, Goertzen, D., Halton, J., Ranson, Q., Bischof, W.F., and Boulanger, P. Using a Multi-Touch Tabletop for Upper-Extremity Motor Rehabilitation. In *Proceedings of the 21st Annual Conference of the Australian Computer-Human Interaction Special Interest Group of the Human Factors and Ergonomics Society of Australia (OzCHI)*, 2009, pp. 261-264.

C1 Lees-Miller, J., **Anderson, F**., Hoehn, B., and Greiner, R. Does Wikipedia Information Help Netflix Predictions? In Proceedings of the Seventh International Conference on Machine Learning and Applications (ICMLA), 2008. pp. 337–343.

Unrefereed Contributions

U13 Chaggar, G., **Anderson, F.,** Annett, M., and Bischof, W.F. Motion Capture and Multi-touch: Aiding Rehabilitation. *Poster at the Department of Computing Science HIP Poster Session*, 2011.

U12 Chang, P.X., **Anderson, F.,** Annett, M., and Bischof, W.F. Visualizing Data Generated From Tabletop Therapy. *Poster at the Department of Computing Science HIP Poster Session*, 2011.

U11 Brown, A., **Anderson, F.,** Annett, M., and Bischof, W.F. Smell-O-Vision: Olfactory Perception in Virtual Reality. *Poster at the University of Alberta WISEST Celebration of Research*, 2010.

U10 Brown, L., **Anderson, F.,** Annett, M., and Bischof, W.F. Objective Performance Assessments Using A Wii Balance Board. *Poster at the University of Alberta WISEST Celebration of Research*, 2010.

U9 Chaggar, G., Annett, M., **Anderson, F.,** and Bischof, W.F. Avedi: Promoting Activity Through E-Textiles. *Poster at the University of Alberta WISEST Celebration of Research*, 2010.

U8 Lawrance, H., Annett, M., **Anderson, F**., and Bischof, W.F. Build-e-Monkey: Exploring Interactive Toys Using Arduinos. *Poster at the University of Alberta WISEST Celebration of Research*, 2010.

U7 Cheek, B., **Anderson, F**., Annett, M., and Bischof, W.F. Stereoscopic Museum: Where Virtual Meets Van Gogh. *Poster at University of Alberta High School Internship Program Poster Session*, 2010.

U6 Sheil, D., **Anderson, F**., Annett, M., Bischof, W.F., and Boulanger, P. Interactive Rehabilitation Through Gaming. *Poster at University of Alberta High School Internship Program Poster Session*, 2009.

U5 Koetter, E., **Anderson, F**., Annett, M., Bischof, W.F., and Boulanger, P. A Virtual World for Equine Assisted Therapy. *Poster at University of Alberta High School Internship Program Poster Session*, 2009

U4 Chan, M., **Anderson, F**., Annett, M., Bischof, W.F., and Boulanger, P. Engaging Apps For Rehabilitation: Guaranteed to Keep Your Arms "Busy" and "Moving"! *Poster at the University of Alberta WISEST Celebration of Research*, 2009.

U3 Cheek, B., **Anderson, F**., Annett, M., Bischof, W.F., and Boulanger, P. Virtual "Wiiality" for Rehabilitation. *Poster at the University of Alberta WISEST Celebration of Research*, 2009.

U2 Hall, M., Bischof, W.F., Annett, M., and **Anderson, F**. Authoring Virtual Environments for Spatial Navigation Studies. *Poster at*

the University of Alberta WISEST Celebration of Research, 2008.

U1 Lam, J., Stroulia, E., Annett, M., and **Anderson, F**. Analyzing the Relationship Between Users Within a Wiki Setting. *Poster at the University of Alberta WISEST Celebration of Research*, 2007.

Patents

P9 **Anderson, F.** Ramakers, R. Fitzmaurice, G. Grossman, T., 2015, RetroFab: A Design Tool for Retrofitting Physical Interfaces using Actuators, Sensors and 3D Printing. Provisional filed December, 2015.

P8 **Anderson F.**, Grossman, T. Nogueira, A. Beirne, N., Matejka, J. Fitzmaurice G., Nagy, D, Li, S. Lafreniere, B., Kerrick, H. and White, T., 2015, Hive User Experience. Provisional filed November 2015.

P7 Cinat, P **Anderson, F.**, Fong, V. 2015, Electronic Communication Tool and System. Provisional filed September, 2015.

P6 **Anderson, F.**, Grossman, T., Fitzmaurice, G., Smartinator: 2015, Enabling Rapid Prototyping of Smart Objects. Provisional filed November, 2015.

P5 Ens, B., Grossman, T., **Anderson F.**, Matejka, J., Fitzmaurice, G., 2015, Candid Interaction: Revealing Hidden Mobile and Wearable Computing Activities. Provisional filed June 2015.

P4 Knibbe, J. Grossman, T., **Anderson, F.**, Fitzmaurice, G., 2015, Smart Safety Goggles. Provisional filed December 2014.

P3 Matejka, J., **Anderson F.**, Fitzmaurice, G., 2015, Techniques for Automatic and Dynamic Opacity Settings for Scatterplots, Filed June, 2015

P2 **Anderson F.**, Grossman, T, Matejka, J. F., Fitzmaurice, G., 2014, Reflection-based Target Selection on Large Displays with Zero Latency Feedback, Filed June 2014. Pending

P1 **Anderson F.**, Grossman, T, Matejka, J. F., Fitzmaurice, G., 2014, Enhancing Movement Training with an Augmented Reality Mirror, Filed June 2014. Pending.

Work Experience

11/2014 – Present
Senior Research Scientist, Autodesk Research
Responsible for the creation, implementation and dissemination of research ideas and prototypes. Involved in the supervision of graduate-level interns, interfacing with product groups throughout the company, and presenting research ideas and themes within the company, as well as externally to the academic community and public.

09/2014 – 05/2014
Research Intern, Autodesk Research
With Dr. Tovi Grossman, Dr. George Fitzmaurice, and Dr. Daniel Wigdor (University of Toronto)
Developed wearable devices that support subtle and discreet input leveraging knowledge and techniques from stage magic and sleight of hand.

08/2013 – 05/2013
Research Intern, Microsoft Research
With Dr. Bill Buxton, Michel Pahud, and Dr. Ken Hinckley
Prototyped and evaluated various interactions involving large screen displays, pen input, mobile phones, and proxemic information.

04/2013 – 12/2012
Research Intern, Autodesk Research
With Dr. Tovi Grossman, Dr. George Fitzmaurice, and Justin Matejka
Developed augmented reality training system for full-body movements (e.g., dance, martial arts, therapy), including Kinect-based recording system, large scale AR mirror, and training software.

09/2012 – 07/2012
Visiting Researcher, Brain and Attention Research Laboratory, University of British Columbia
With Dr. Alan Kingstone
Analysis of eye movements and development and analysis of methods for scanpath comparison. Cognitive issues in gestural interfaces (learning, gesture choice).

09/2008 – 05/2008
Research Assistant, Advanced Man Machine Interface Lab, University of Alberta
Dr. Pierre Boulanger, Dr. Walter Bischof
Configured and interfaced with various hardware for use with the Virtools platform. Developed immersive worlds using Maya and Virtools for deployment in a virtual reality environment (CAVE). Interfaced with a biological cell simulator developed as part of CyberCell to visualize molecular interactions in real time to allow for computational steering.

09/2007 – 05/2007
Research Assistant, Networking Lab, University of Alberta
Dr. Ioanis Nikolaidis
Configured outdoor wireless routers for a sensor network project. Learned about Linux in detail, serial communications, Perl scripting and networking issues. I also gained experience in a research environment by working closely with graduate students.

05/2007 – 05/2006 **Software Developer, Planet Correspondence Technologies**
Steve Hole
Developed software for financial and communication applications. Gained experience with J2EE, EJBs, Web Services, reporting tools, document transforms, and various other technologies. Learned about software development process and the requirements of production code.

Presentations

10/2015 **Anderson, F.** Experience Design for the Internet of Things
Autodesk X Summit, San Francisco, USA.

7/2015 **Anderson, F.,** Tessier, A. Interacting with the Internet of Things
Autodesk Technical Summit, Singapore

10/2014 **Anderson, F.** Deceptive Devices for Illusory Interaction.
Autodesk CTO Intern Showcase, Toronto, Ontario

05/2014 **Anderson, F.** Interacting with Movement
Autodesk Research Guest Presentation, Toronto, Ontario

10/2013 **Anderson, F.**, Grossman, T., Matejka, J., and Fitzmaurice, G. YouMove: Enhancing Movement Training with an Augmented Reality Mirror
User Interfaces and Software Technology (UIST) 2013, St. Andrews, Scotland.

04/2013 **Anderson, F.**, and Bischof, W.F. Learning and Performance with Gesture Guides
*ACM SIGCHI Conference on Human Factors in Computing Systems (*CHI) 2013, Paris, France.

09/2012 **Anderson, F.**, and Bischof, W.F. Augmented Reality Improves Myoelectric Prosthesis Training
International Conference on Disability, Virtual Reality and Associated Technologies, 2013, Laval, France.

09/2012 Annett, M., **Anderson, F.**, and Bischof, W.F. User Perspectives On Multi-Touch Tabletop Therapy
International Conference on Disability, Virtual Reality and Associated Technologies, 2013, Laval, France.

04/2012 **Anderson, F.**, Gesture Learning and Performance
Brain and Attention Research Lab, Vancouver, Canada.

05/2011 **Anderson, F.**, Evaluating Surgical Skill and Developing an Augmented-Reality Myo-Electric Trainer
Brain and Attention Research Lab, Vancouver, Canada.

11/2010 **Anderson, F.**, and Annett, M., Grad School, and Making People and Computers Get Along.
Invited talk at CMPUT 495 Honour's Seminar, Edmonton, Canada.

04/2010 **Anderson, F.** Augmented Reality Myoelectric-prosthesis (ARM) trainer.
Glenrose Rehabilitation Hospital, Edmonton, Canada.

03/2010 **Anderson, F.** and Annett, M., Bischof, W.F., and Boulanger, P. *Virtual Equine Assisted Therapy*
IEEE Virtual Reality 2010, Waltham, USA.

11/2009 Annett, M. and **Anderson, F.** Using a Multi-Touch Tabletop for Upper-Extremity Motor Rehabilitation
Conference of the Australian Computer-Human Interaction Special Interest Group of the Human Factors and Ergonomics Society of Australia (OzCHI), Melbourne, Australia.

11/2009 Annett, M. and **Anderson, F.** Reach Out and Touch Me!
Glenrose Rehabilitation Hospital Spotlight on Research Breakfast, Edmonton, Canada.

10/2009 Annett, M. and **Anderson, F.,** Technology Assisted Rehabilitation
Traumatic Brain Injury Retreat, Glenrose Rehabilitation Hospital, Edmonton, Canada.

10/2009 **Anderson, F.** and Annett, M. Pressure – It Makes Your Life Easier
User Interfaces and Software Technology (UIST) Student Innovation Competition, Victoria, Canada

09/2009 Annett, M. and **Anderson, F.** Interactive tabletops to promote patient compliance.
Glenrose Rehabilitation Hospital Courage Awards, Edmonton, Canada.

08/2009 Annett, M. and **Anderson, F.** Horses, Giant iPods, Surgery (and other related things).
University of Alberta BioEngineering Summer Student Presentation Series 2009, Edmonton, Canada.

05/2009 **Anderson, F.** Capture and analysis of surgical movements.
University of Alberta BioEngineering Summer Student Presentation Series 2009, Edmonton, Canada.

Awards and Scholarships

2015 | **CHI Honorable Mention**
For: *Supporting Subtlety with Deceptive Devices and Illusory Interactions*

2015 | **CHI Honorable Mention**
For: *Dynamic Opacity Optimization for Scatter Plots*

2010-14 | **PhD Graduate Student Scholarship in Information and Communication Technology**
Alberta Innovates / iCORE, $12,500 per year

2010-13 | **Frederick Banting and Charles Best Canada Graduate Scholarships Doctoral Award**
Canadian Institute of Health Research, $35,000 per year

2006-13 | **Golden Key Honour Society Invitation**
Declined

2011 | **Outstanding Thesis (Finalist)**
Western Association of Graduate Schools

2011 | **Outstanding MSc Thesis Award (Runner Up)**
Department of Computing Science, University of Alberta

2010 | **President's Doctoral Prize of Distinction**
Faculty of Graduate Studies and Research, University of Alberta, $10,000

2010 | **Departmental Outreach Reward**
Department of Computing Science, University of Alberta

2010 | **Alberta Graduate Student Scholarship**
Alberta Advanced Education, $3,000

2009 | **Profiling Alberta's Graduate Students Award**
Faculty of Graduate Studies and Research, University of Alberta, $1,300

2009 | **GSA Travel Award**
Graduate Student's Association, University of Alberta, $150

2009 | **Frederick Banting and Charles Best CGSM**
Canadian Institutes of Health Research, $17,500

2009 | **Walter H. Johns Graduate Fellowship**
Faculty of Graduate Studies and Research, University of Alberta, $4,627

2008 | **Teaching Assistant Award (Nomination)**
University Teaching Service, University of Alberta

2008 | **Undergraduate Student Research Award**
Natural Sciences and Engineering Research Council, $4,500

2005-07 | **Jason Lang Scholarship**
Alberta Scholarship Programs, $3,000

2005-06 | **Dean's Honour Roll**
University of Alberta

2004-05 | **First Class Academic Standing**
Grant MacEwan College

2003 | **Rutherford Scholarship**
Alberta Scholarship Programs, $1,200

Teaching

2014 | **CMPUT 302 (Lecturer)**
Human Computer Interaction

2014 | **CMPUT 275 (Assistant)**
Introduction to Tangible Computing II

2013 | **CMPUT 274 (Assistant)**
Introduction to Tangible Computing I

2011 | CMPUT 302 (Lecturer, Assistant)
Human Computer Interaction

2010 | CMPUT 510 / NEURO 496 (Assistant)
Computational Neuroscience

2009 | CMPUT 101 (Assistant)
Introduction to Computing Science

2009 | CMPUT 510 / NEURO 496 (Assistant)
Computational Neuroscience

2008 | CMPUT 101 (Assistant)
Introduction to Computing Science

Supervision

2011 | High School Internship Program
Chaggar, G. and Chang, P.

2010 | High School Internship Program
Cheek, B.

2009 | Women in Scholarship, Engineering, Science and Technology Program
Brown, A., Brown, L., Chaggar, G., and Lawrance, H.

2009 | High School Internship Program
Koetter, E. and Sheil, D.

2009 | Women in Scholarship, Engineering, Science and Technology Program
Chan, M. and Cheek, B.

2009 | Research Intern
Houshyar, N.

2007 | Women in Scholarship, Engineering, Science and Technology Program
Hall, M.

2007 | Women in Scholarship, Engineering, Science and Technology Program
Lam, J.

Outreach and Service

2013-14 | Curriculum Committee Member, Department of Computing Science, University of Alberta
Provide input and direction on the undergraduate curriculum.

2008-14 | Demonstrations and presentations for the Advanced Man Machine Interface Lab
Showcase current technology and research from the lab. Present material to large and small groups, from children to professors.

2007-13 | Outreach and demonstrations for the Department of Computing Science, University of Alberta
Teach Junior and Senior High School students basic computing skills. Demonstrate current research in Computing Science. Talk to prospective (undergrad and grad) students about the CS program

2010-13 | Client and supervisor for projects in CMPUT 302, University of Alberta
Define project specifications, advise undergraduate students throughout the year on implementation and evaluation details.

2009-12 | Science fair judge
Judge student projects at the Edmonton Regional Science Fair as well as smaller school-wide science fairs.

2009-11 | Councilor at Large for the Graduate Student's Association, University of Alberta
Represent the graduate student population to the GSA executives.

2011 | Student Volunteer, ACM SIGCHI Conference on Human Factors in Computing Systems (CHI)
Vancouver, Canada

2009-10 | Member of the University Appeals Board, University of Alberta
Adjudicate appeals of students charged under the code of student behavior and the code of applicant behavior.

2010 | Student Representative, Faculty of Graduate Studies and Research Council, University of Alberta
Represent graduate student interests to the University.

2010 | Student Volunteer, IEEE VR, 3D User Interfaces and Haptic Interfaces 2010
Waltham, United States

2010 | Presentation Judge, FIRST Lego League of Alberta
Judge the research presentations of 10-14 year olds participating in the FIRST Lego League robotics challenge.

2009-10 | Member of Department of Computing Science Graduate Advisory Committee , University of Alberta
Convey graduate student concerns to the graduate chair.

2009 | Teaching Assistant Facilitator, Department of Computing Science, University of Alberta
Participate in, and help construct a workshop to provide new TAs with information that will help them perform their duties well.

2009 | Student Volunteer for American Association for Corpus Linguistics
Edmonton, Alberta, Canada

2009 | Judicial Committee Chair, Graduate Student's Association, University of Alberta
Organize hearing for complaints brought against GSA executives. I also helped define bylaws to ensure a fair hearing.

2009 | Tutor for CMPUT 114 (Unofficial), University of Alberta
Explain various programming concepts and problems.

2007-08 | Software leader of the Autonomous Robotic Vehicle Project, University of Alberta
Write research and sponsorship proposals to obtain funding. Organize and participate in events and demonstrations. Design and oversee software components for submersible robot.

Professional activities

Committee Membership

2016 | Program Committee Member, CHI Late Breaking Work

2015 | Program Committee Member, MobileHCI

Reviewing

2012-16 | ACM SIGCHI Conference on Human Factors in Computing Systems (CHI)

2016 | ACM Conference on Designing Interactive Systems (DIS)

2015 | ACM Conference on Mobile and Ubiquitous Computing (UbiComp)

2015 | Journal of Behaviour & Information Technology

2015 | Augmented Human (AH)

2014-15 | Graphics Interface (GI)

2014-15 | ACM Conference on Human-Computer Interaction with Mobile Devices and Services (MobileHCI)

2014 | ACM Conference on Pervasive and Ubiquitous Computing (UbiComp)

2013-14 | International Conference on Tangible, Embedded and Embodied Interaction (TEI)

2011-13 | International Journal of Medical Robotics and Computer Assisted Surgery

2013 | International Conference on Multimodal Interfaces (ICMI)

2013-15 | User Interfaces and Software Technology (UIST)

2012 | Occupational Therapy International

2009 | IEEE Virtual Reality (VR)

2009 | Conference of Australian Computer-Human Interaction (OzCHI)