

Annual Report Template for Organized Research Units

Office of the Vice-President Research & Innovation
York University

Please see the Annual Report Guide for additional instructions to complete the Template. Note that Annual Reports for 2012-13 are due by Friday, **May 10, 2013**.



CENTRE FOR VISION RESEARCH Annual Report May 1, 2012 – April 30, 2013



1. Contact Information

Director	Laurence Harris
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2. List Faculties that supplied active members to the ORU, indicating the number of active members from each.

Faculty of Health	17
Faculty of Science and Engineering	11
Both Health & Science and Engineering	1
Glendon College	1

3. Charter dates: first Charter **1992**; last renewal **Feb 2010**

4. Mandate

Our mandate is to pursue interdisciplinary research and training in the broadly-defined visual sciences and their applications. The sense of vision does not stand alone: it is the primary input not only for understanding the world around us, but also for guiding action in the world, for determining interaction with the world and inherently integrates with the other sensory processes. The CVR provides a simple and effective infrastructure that provides members with maximal freedom in pursuing their research programmes while encouraging collaboration among members and across disciplines.

5. Membership and Governance

Members of the centre

Core faculty members	30
Adjunct faculty members	22
Postdoctoral members	18
Research associates	14
Research assistants	5
Student members	78
Total	167

CVR members (York faculty; n=30)	
Scott Adler	Associate Professor of Psychology <i>development of eye movement control, visual selective attention, object recognition, and visual expectations</i>
Rob Allison	Associate Professor of Computer Science and Engineering <i>stereoscopic vision, perceptual issues in virtual environments, eye movements</i>
Chris Bergevin	Assistant Professor in Physics
Doug Crawford	Professor of Psychology, Biology and Kinesiology and Health Science; Canada Research Chair in Visual-Motor Neuroscience National Coordinator of the Canadian Action and Perception Network (CAPnet) <i>three-dimensional eye and head movements, eye-hand coordination, trans-saccadic perceptual integration, modeling, neurophysiology</i>
Joseph DeSouza	Assistant Professor of Psychology, Biology and Neuroscience <i>Diploma systems neuroscience, frontal cortex, attention, fMRI, corollary discharge, eye position signals and oculomotor neurophysiology</i>
James Elder	Professor of Computer Science & Engineering, and Psychology <i>human and computer vision</i>
Mazyar Fallah	Associate Professor of Kinesiology and Health Science, Biology and Psychology <i>visual perception and attention, object processing, concussion, oculomotor systems.</i>
Laurence Harris	Professor of Psychology, Biology and Kinesiology and Health Science; <i>multisensory processing, perception and coding of space, time, the body and self-motion</i>
Denise Henriques	Associate Professor Kinesiology and Health Science and Psychology <i>motor learning, multisensory integration, visuomotor control, eye-hand coordination</i>
Kari Hoffman	Associate Professor of Psychology <i>face processing, learning, memory and plasticity, sleep oscillations</i>
Ian Howard	Distinguished Research Professor of Psychology and Biology

	<i>space perception, eye movements, binocular vision</i>
Richard Hornsey	Professor of Computer Science and Physics; Associate Dean, Faculty of Science and Engineering <i>integrated electronic sensors, biologically inspired image sensors, low vision enhancement systems, sensors for space applications</i>
Michael Jenkin	Professor of Computer Science <i>computer vision, mobile robotics, immersive visual displays</i>
Richard Murray	Associate Professor of Psychology <i>visual psychophysics, spatial vision, 3D shape perception</i>
Hiroshi Ono	Distinguished Research Professor of Psychology <i>visual perception of direction and distance, eye movement</i>
David Regan	CAE/NSERC Industrial Research Professor; Distinguished Research Professor of Psychology and Biology; Professor of Ophthalmology and Medicine, University of Toronto; Fellow of the Royal Society of Canada; Foreign Fellow of the Royal Netherlands Academy of Science <i>psychophysics of spatial vision, motion, stereopsis, colour vision, vision aviation, visually evoked magnetic and electrical brain activity, visual disorders, auditory psychophysics</i>
Josée Rivest	Associate Professor of Psychology, Glendon College; Department of Psychology, Baycrest Centre for Geriatric Care <i>neuropsychology, face and object recognition, rehabilitation of visual neglect</i>
Keith Schneider	Associate Professor of Biology; Facility Director of Neuroimaging Laboratory <i>neural mechanisms of attention and perception; phenomenology of attention; MRI methodology</i>
Lauren Sergio	Associate Professor of Kinesiology and Health Science <i>neural mechanisms of visually guided reaching in parietal and precentral cortex</i>
Minas Spetsakis	Associate Professor of Computer Science <i>computer vision and robotics</i>
Jennifer Steeves	Associate Professor of Psychology; Adjunct Scientist Neurosciences and Mental Health, The Hospital for Sick Children Research Institute; Adjunct Associate Professor, Department of Ophthalmology and Vision Sciences, Faculty of Medicine, University of Toronto <i>face and scene processing in neurological patients and one-eyed observers</i>
Martin Steinbach	Distinguished Research Professor of Psychology and Biology; Director, Vision Science Research, Toronto Western Hospital; Senior Scientist, Dept. of Ophthalmology, Hospital for Sick Children; Director of Research, Department of Ophthalmology, University of Toronto <i>eye movements, visual-motor coordination, clinical disorders of the oculomotor system</i>
Wolfgang Stuerzlinger	Professor of Computer Science and Engineering <i>human-computer interaction, virtual reality, computer graphics</i>
Christine Till	Associate Professor of Psychology, Adjunct Scientist Neurosciences and Mental Health, The Hospital for Sick Children Research Institute <i>Neural, clinical, and functional correlates of preserved and impaired cognition in children and adolescents with diffuse central nervous system insult; Rehabilitation strategies to enhance cognition in neurological populations;</i>

	<i>Structural and functional neuroimaging; pediatric neuropsychology</i>
John Tsotsos	Distinguished Research Professor of Vision Science; Professor of Computer Science and Engineering; Canada Research Chair in Computational Vision; Adjunct Professor, Dept. of Computer Science, University of Toronto; Adjunct Professor, Dept. of Ophthalmology, University of Toronto; Fellow, Royal Society of Canada <i>human and machine vision, computational models of attention, motion understanding, robotics</i>
Laurie Wilcox	Professor of Psychology; Graduate Director, Department of Psychology; member of 3D Film and Innovation Consortium (3D FLIC), Sensorium, and IRLT <i>stereopsis/depth perception and 3D media</i>
Richard Wildes	Associate Professor of Computer Science <i>spatiotemporal analysis of visual information, motion analysis, binocular vision</i>
Frances Wilkinson	Professor of Psychology Affiliated Scientist, Division of Applied and Interventional Research, Toronto Western Research Institute, University Health Network, Toronto; Adjunct Professor - Department of Ophthalmology, University of Toronto <i>involvement of the visual system in migraine; intermediate visual form perception using psychophysical, computational and fMRI methodologies; impact of environmental lighting conditions on the visual system in normal aging</i>
Hugh Wilson	Professor of Biology. ORDCF Chair of Biological and Computational Vision; Fellow, Canadian Institute for Advanced Research; Fellow, Optical Society of America <i>psychophysical and neural models of form vision; fMRI studies of cortical form vision, nonlinear dynamics of cortical function</i>
Thilo Womelsdorf	Associate Professor of Biology. <i>brain mechanisms of attention</i>

Other members (see Guide)

ADJUNCT MEMBERS	
Suzanna Becker	Psychology, McMaster University <i>Neural network models of learning and memory, computational neuroscience, unsupervised learning in perceptual systems, long-term priming, semantic memory organization, the role of feedback in cortical processing, involvement of the hippocampal, frontal and parietal brain regions in memory formation and retrieval. Neural networks for signal processing: image analysis and compression.</i>
Pat Bennett	Psychology, McMaster University <i>Visual Perception, spatial vision, psychophysics, perceptual learning and development, aging and vision, ideal observer theory</i>
Jennifer Campos	Toronto Rehabilitation Institute <i>Self-motion perception, multisensory integration, perception-action coupling,</i>

	<i>visuomotor control, Virtual Reality, the interactive nature of perception and action, locomotor rehabilitation</i>
Sven Dickinson	Computer Science, University of Toronto <i>computational vision, object modeling, object recognition (both bottom-up and top-down), attention, shape recovery, and tracking, and how they may be unified under a single representational framework</i>
Cheyne Douglas	Medical Imaging, University of Toronto
Elizabeth Irving	Optometry, Waterloo
Alan Jepson	Computer Science, University of Toronto <i>low, intermediate and high level vision.</i>
Jocelyn Keillor	National Research Council, Canada
Richard Mann	Computer Science, University Waterloo <i>Computational vision (high-level vision, motion understanding, event recognition); Perception; Artificial intelligence</i>
Matthias Neimeier	Psychology, University of Toronto <i>Trans-saccadic integration, what kind of information is stored across saccadic eye movements? How is it represented in the brain? How can it be employed for perceptual tasks? Computational simulations, psychophysical methods and eye movement recordings and fMRI.</i>
Kathleen O'Craven	Psychology, University of Toronto <i>fMRI, visual attention, visual cognition, imagery, inhibitory processes, top-down effects, extra-striate cortex, perception of faces and places</i>
Jay Pratt	Psychology, University of Toronto <i>Visual Attention, Eye Movement, Motor Control, Age Related Changes in Attentional and Motor Systems</i>
Brian Rogers	Experimental Psychology, University of Oxford <i>Experimental studies of human visual perception - particularly 3-D vision: Stereopsis, structure from motion; perception of motion, visual control of locomotion, perception theory, artificial intelligence and computational studies.</i>
Allison Sekuler	Psychology, McMaster University <i>Cognitive neuroscience, visual perception, perceptual organization, face and object recognition, motion perception, aging and vision, neuroimaging</i>
Andrew Smith	Psychology, Royal Holloway University of London <i>fMRI of brain processes involved in motion perception</i>
NikoTroje	Dept. of Psychology and School of Computing, Queen's University <i>Visual perception, biological motion perception, face recognition, cognitive neuroscience, neuroethology, computer vision.</i>
Doug Tweed	Psychology, University of Toronto <i>Sensory-motor transformations, computational models, visual and gaze-control systems. Models of binocular coordination and depth vision. My work has emphasized the importance to brain theory of nonlinear algebra and dynamics, optimization, natural selection and learning.</i>
Carol	Hospital for Sick Children

Westall	<i>Clinical pediatric visual electrophysiology</i>
Dave Williams	Director of South Lake Regional Health Centre <i>Ex Astronaut</i>
Agnes Wong	Ophthalmology and Vision Sciences, University of Toronto <i>Strabismus and issues in child vision</i>
Richard Zemel	Computer Science, University of Toronto <i>Machine learning and perception, using techniques from statistics and information theory, including unsupervised learning and information combination in uncertain environments, and mathematical and computational models of neural processing and representations.</i>

<i>Steering Committee members</i>	
Director	L. Harris
Associate director	R. Allison (-Dec 2012), R. Wildes (Jan 2013-)
MRI facility director	K. Schneider
Member	S. Adler
Member	J. Elder
Member	M. Fallah
Member	D. Henriques
<i>MRI business committee</i>	
	Laurence Harris (chair)
	Donna Smith (-Feb 2013)
	Lisa Philips (Feb 2013-)
	Keith Schneider (Facility Director)
	Jennifer Steeves
	Christine Till (-Feb 2013)
	Gary Turner (Feb 2013-)
	Alison Collins
	Maz Fallah
	Joanna Rainbow (Legal Counsel)

Advisory Board members (if any) **N/A**

6. Annual Progress in Fulfilling Mandate

1. Submitted funding **proposals for large scale or team activities**

(*=successful)

INITIATIVES SUBMITTED that were LED BY CVR

- NSERC CREATE Initiative from Crawford. “The Brain in Action” (9 Co-Applicants at York, Queens, Western). This application was part of a German/Canadian initiative. The German part DFG/IRTG “ The Brain in Action”(Bremmer PI) was funded (\$5,500,000)
- * CFI Leading Edge Fund, (\$1,977,278) “Full field vision and spatial orientation” (PI Laurence Harris and 9 others including Allison, Wilcox, Jenkin)
- NSERC CREATE initiative from Jenkin "Telerobotics and autonomous systems” (other faculty: Tsotsos, Allison, Jenkin and 6 others).
- *Allison, R.S. (with Wilcox) 3D High Frame Rate Movie-making: Creative and Technical Foundations for Widespread Commercial Adoption NSERC CUI I2I 2013-2015 \$429,648 with Sheridan College and Christie Digital
- *OMDC \$100,000/yr (PI Allison plus 5 others including Wilcox) Entertainment and Creative Cluster Partnerships Fund, The 3D Film Innovation Consortium (3D FLIC): Phase II
- *NSERC \$95,612/yr (Wilcox PI; Allison co-I plus 1 other) New Media Initiative: Motion in Depth

INITIATIVES SUBMITTED that were FACILITATED D BY CVR MEMBERS

- Exploring Space Neuroscience Data. EU 7th Framework Program Grant. Large group. PI McIntyre (Paris) (included CVR members Harris and Jenkin) €2,047,458
- * ORF/RE \$3,844,826 (PI A. Asif; Allison and Stuerzlinger and Tsotsos Co-Is plus 14 others) Ontario Research Fund/Research Excellence, Centre for Innovation in Information Visualization and Data Driven Design (CIV/DDD)
- * NSERC Strategic Network Grant in Field Robotics.(NFRN). \$1M/year x 5 years. Dudek PI; Jenkin and Tsotsos co-Is. <http://ncfrn.mcgill.ca/>

2. **conferences, workshops, exhibits or other events** hosted or organized (indicate total numbers in attendance and total number of participants from outside York University, outside Ontario and outside Canada)

- Till organized a **CIHR planning grant meeting** in September 2012 in Toronto to discuss future grant topics related to: Multimodal complex data analyses of structural and functional magnetic resonance imaging in pediatric multiple sclerosis. Number of invitees = 24, from York = 5, from Toronto = 10, from outside Ontario = 5, from outside Canada = 4

- **Canadian-German workshop** at York (Henriques coordinator of this workshop that included 7 German applicants and 7 Canadian applicants to a DFG-CREATE International grant). Funded by York Incentive Grant.
- **NSERC CREATE Bootcamp.** Organized and chaired by Elder. (CVR members involved: Wilson, Elder, Harris, Wilkinson, Steeves) Key Canadian display technology companies VPixx and Christie Digital contributed speakers and discussion leaders to our summer bootcamp. Key organizations who participated include: 1) The Communications Research Centre 2) The National Research Centre, 3) The Canadian Space Agency, 4) The Ontario Centres of Excellence, 5) Venture Lab, 6) MaRS Innovation, 7) FED DEv, 8) Venquest Management. Number of attendees = 60, from York = 46, from outside York = 13, from outside Ontario = 1
- **Matlab Analysis FieldTrip Workshop**, 8-11th March 2013 at York University
Organizer: Womelsdorf. Attendance: 48 people (PhD candidates, postdocs, PIs) from 8 Canadian Universities, 2 Canadian research Institutes and 1 US University
- **3DFlic Workshop** on High Frame Rate Cinema High Frame Rate Workshop – as part of 3DFLIC, OMDC funding – Industry focused (Allison and Wilcox) Pinewood Studios/SIRT in Toronto Nov 20, 2012. 75 participants with ~10 from York, 7 from outside Ontario and 4 from outside Canada
- **3DFlic Workshop** on 2D to 3D Conversion as part of 3DFLIC, OMDC funded. York University, Mar 26, 2013. Co-organized by Allison and Wilcox. 75 participants with ~10 from York (including Elder) and ~ 6 from outside Canada
- **CVR annual summer school**, organized by DeSouza and Henriques, took place in June 2012 and was attended by 25 invited students of which 10 were from outside Ontario and 2 were from outside Canada.
- **CVR research retreat**, organized by Elder (April 12, 2012), attended by the majority of CVR faculty. Took place at the Drake hotel. Several useful collaborations were formed.
- Stuerzlinger was the program chair for ACM Symposium on Virtual Reality Software and Technology, VRST 2012, Dec 10-12, Toronto, approx. 100 international attendees.
- Schneider, Harris, Adler, Jenkin and Steeves have given multiple tours to various groups of school children and visitors of the Sherman Health Sciences Research Centre.

3. **knowledge mobilization/engagement/outreach/technology transfer activities** and accomplishments

- Wilkinson established relationships with both academic and industry experts in the field of lighting (Dr. Roberts, Fordham Univ, NY; Dr. Veitch, NRC; Canlyte Canada); active participant in local chapter of Illuminating Engineering Society;
- Wilkinson took part in a CTV interview about Migraine and Lighting Research Jan 3, 2013 <http://www.ctvnews.ca/video?clipId=836684>
- De Souza: http://www.rcinet.ca/english/daily/interviews-2012/13-42_2013-02-04-dance-to-be-tested-as-a-therapy-for-parkinson-s/
- Sergio took part in the Ontario Science Centre SciFri (event for teenagers), Games and your Brain, April 2013
- Sergio's research was mentioned in the The Hockey News Feb. 26 2013, "Bourque mystery concussion a troubling sign" <http://www.thehockeynews.com/articles/50250-Bourque-mystery-concussion-a-troubling-sign.html> and in a **Scientific American Mind**, (Jan 2013) in a story on video games and the brain <http://www.scientificamerican.com/article.cfm?id=how-video-games-change-brain>
- Sergio carried out concussion baseline testing and youth coordination testing, with numerous youth teams in the GTA (hockey, soccer, lacrosse) and with coordination testing for NHL's Central Scouting for top 100 draft picks at scouting combine
- Wilcox participated in the Reel Asian Film Festival, February 2012 as a member of a panel discussing 3D filmmaking
- Bergevin took part in "Let's Talk Science": York University high school outreach (Nov. 2, 2012)
- Rivest provided neuropsychological evaluations, education, and rehabilitation to individuals suffering from brain damage to the visuo-perceptual system at the Baycrest hospital.
- Elder is collaborating with Zerofootprint (www.zerofootprint.net) on a sustainability research project *Dynamic Carbon Activity Mapping in Urban Environments* funded by the Centre for Innovation in Information Visualization and Data-Driven Design (\$25,000 over 1 year)
- Elder is collaborating with the Ministry of Transportation Ontario on a research project funded by OCE and GEOIDE on using highway cameras for traffic analytics (paper to be submitted in April 2013).

- Elder met with Avaya (www.avaya.com) and Engineering Harmonics (www.engineerharmonics.com) to plan development of attentive sensing technologies for remote learning and teleconferencing.
- Elder met with engineers at the Kortright Centre for Conversation (kortright.org) to discuss collaborative project opportunities for sensing and visualization in their Archetype Sustainable House project.
- In collaboration with colleague Gunho Sohn from ESSE, Elder's laboratory has developed a 3D urban awareness system. A demonstration of the prototype system operating at York University can be seen <http://icampus.apps01.yorku.ca/demo/index.html>.
- Elder and co-inventors in his lab were awarded a Canadian Patent, for their Attentive panoramic sensing for visual telepresence technology (#2,386,347), Sept.5, 2012. (The US patent was awarded in 2006.)
- Invited Talks

INVITED RESEARCH TALKS

- Tsotsos: Annual Interdisciplinary Conference, Jackson Hole WY, Jan 30 - Feb 3, 2013
- Tsotsos: American Association for Artificial Intelligence (AAAI) 2012
- Crawford chaired a Nanosymposium at the Society for Neuroscience Annual meeting Oct 15, 2012 New Orleans.
- Ono: Ritsumeikan University, March 17th, 2012, Kyoto, Japan.
- Elder: Computational Vision Summer School, Tübingen, Germany
- Elder, 3DTown:, *Digifest 2012*, Toronto.
- Elder, 2D/3D Conversion: U of Toronto
- Elder, Annual Interdisciplinary Conference, Jackson Hole, WY, 2013.
- Elder, Computational and Mathematical Models in Vision 2012, Naples, FL
- Stuerzlinger: McMaster University (April 2013)
- Harris: the Banting Research talk at Western (Oct 3).
- Schneider: Western (July 26) and Queens (Nov. 14) universities
- Hoffman: U Wisconsin and U Toronto

OUTREACH TALKS

- Sergio: York Circle talk March 2013 (York Advancement)
- Sergio: York Region Nurse Practitioner conf, at Southlake Hospital, Nov 2012
- Sergio: Etobicoke Dolphins Hockey Association for players and parents, Mastercard Centre, Dec 2012
- Sergio: Integrated Partnership for Seniors Feb 2013

- 4. Facilitating faculty or student research** through mentorship, development or support programs or services (*e.g., in-house workshops, grant preparation support. Include a list of all the students (graduate and undergraduate).*).

- The CVR offered a grant assessment program that may have contributed to our outstanding grant success this year (see section 7 and appendix 3).
 - The Marian Regan Award for best Master's thesis in Vision Science (created 2012) awarded to Larissa McKetton (supervisor: Schneider)
 - Wildes' student Mikhail Sizintsev was awarded the 2012 Canadian Image Processing and Pattern Recognition Society Doctoral Dissertation Award. (Best dissertation completed at a Canadian institution in computer vision, robot vision, robotics, medical imaging, image processing or pattern recognition.
 - Crawford Assisted in organization of **CAN-ACT** retreat at Kingsbridge Centre (King City Ontario) Sept 17, 2012 with over 40 students, faculty, and non-academic guests in attendance.
- 5.** contributions to **teaching** (e.g., delivery or creation of certificate, diploma, graduate, or continuing education programs)

York University graduate courses directed by CVR members:

- PSY 6945.03 Applied Pediatric Neuropsychology (Till)
 - KAHS 6152/ PSYC 6277 (Henriques)
 - PSYCH 4360 / 6260 - Visuospatial Memory and Goal Directed Action (Crawford)
 - PSYC 6254 Abnormal visual development (Steeves)
 - BIOL 5148 Introduction to fMRI (Schneider)
 - CSE6340 Embodied Intelligence (Tsotsos)
 - BIOL 5149 Applications of Visual Science CREATE graduate course (Wilson)
(Many CVR members contributed lectures to this course)
 - KAHS 6150 Cortical Control of Movement in Health and Disease (Sergio)
 - KAHS 6155 Fundamentals of Neuroscience I (Sergio, Fallah)
 - PSYC 6273 – Computer programming for exp. Psych. (Murray)
 - PSYC 6635 Developing the Visual Brain (Adler)
 - CSE 6390D/PSYC 6750B Computational Modeling of Visual Perception (Elder)
 - PSYC 6256M Principles of Neural Coding (Elder)
 - CSE 5327A Introduction to Machine Learning and Pattern Recognition (Elder)
 - CSE6337, 3D User Interfaces (Stuerzlinger)
 - CSE 5323, Computer Vision (Wildes)
 - CSE 6333, Multiple View Image Understanding (Wildes)
- Hoffman, Womelsdorf and Tsotsos coordinated the Systems and Computational Neuroscience speaker series <http://syscomp.apps01.yorku.ca/>
 - Till coordinated the York Seneca Rehabilitation Certificate Program
 - Sergio coordinated the Neuroscience Graduate Diploma Program

- Harris was awarded the faculty of graduate studies teaching award for contributions to graduate teaching at York.
- 6. other research leadership activities during reporting period**
- The MRI business committee continues to look at ways of developing the York University Magnetic Resonance Imaging facility
 - Till took part in the NINDS Multiple Sclerosis Common Data Elements Working Group
 - Wilson directed the NSERC CREATE Grant in Vision Science & Applications in collaboration with the other CVR members on this grant
 - **Editorial Boards**
 - Elder, Journal of Vision
 - Elder, IET Computer Vision
 - Elder, ACM Transactions on Applied Perception
 - Tsotsos. Computer Vision and Image Processing (Area Editor),
 - Tsotsos. Image and Vision Computing (Advisory Board),
 - Harris. Multisensory Research (Editor in Chief)
 - Tsotsos. Computational Imaging and Vision, Springer
 - Steinbach Snell Scientific Updates in Ophthalmology (Editor)
 - Steinbach: Binocular Vision and Strabismus Quarterly (Editor)
 - Steinbach. Canadian Journal of Ophthalmology (Contributing Editor)
 - **Research Committees and boards**
 - Tsotsos Member, Hellenic Quality Assurance Agency for Higher Ed. Greece
 - Tsotsos NSF Review Panel
 - Tsotsos. Evaluation Committee 7th EU Framework Programme for research and technology development (FP7) – Information and Communication Technologies (Cognitive Systems and Robotics)
 - Tsotsos. National Science Foundation, USA, College of Reviewers
 - Harris. NASA review panel (Washington)
 - Steinbach Member of Board: Smith Kettlewell Eye Res. Inst., San Francisco
 - Steinbach CNIB/Baker Foundation for the Prevention of Blindness.
 - Steinbach Executive Member, National Coalition for Vision Health .
 - Steinbach. Research Committee, Kensington Eye Institute, Toronto
 - Steinbach Board Member, 20/20 NSERC Ophthalmic Materials Network
 - Steinbach Board Member, Ontario Research Fund Retinal Blood Flow and Imaging Network Research Committee.
 - Steeves NSERC grants award panel
 - Stuerzlinger: board of directors of GRAND Network Centres of Excellence

- De Souza guest lecturer in Training school in TIMELY School on “Timing and Time Perception, Corfu, Greece, February 4th to 8th, 2013.
- Sergio served as CIHR university delegate – provide link to faculty from CIHR about programs

7. **Research grants and contracts** active during the reporting period.

- A list of all the grants and contracts obtained by CVR members is provided as appendix 3 below. The total amount of grants brought to York University by CVR members during the reporting period is \$7,390,277 from individual and CVR-led group grants, including \$1,524,139 (NSERC) and \$1,149,770 (CIHR); in addition CVR members have facilitated \$7,135,333 in non-CVR-led group grants.

7. Financial Accountability (reported separately)

8. Objectives for Upcoming Year

- a. **funding proposals anticipated** for submission by April 30, 2014

- **Brain Canada**

- The CVR is planning to spearhead a major initiative under **Brain Canada** in which we intend to coordinate a National team for the distribution and sharing of Brain Imaging data. This will be a multi-million dollar initiative involving updating and coordination many MRI facilities across the country and creating a central database of experimental data. The PI will be Schneider with the backing and support of the Centre working closely with ORS’s Paulina Karwowska-Desaulniers, their Strategic and Institutional Research Specialist.

- **NCE**

- The CVR is exploring possible connections with a **National Centre of Excellence** also with the guidance of Paulina Karwowska-Desaulniers, ORS’s Strategic and Institutional Research Specialist.

- **Canadian Institute for Advanced Research CIFAR**

- Elder and Harris will be submitting an LOI in response to the 2013 call on the topic of perceptual organization. \$800,000/yr for 5 years.

- **Ontario Brain Institute**

- The CVR is watching closely for developments from the **Ontario Brain Institute** from whom a call for application is expected shortly. Crawford has made provisional contact with Dr. Donald Stuss, the director.

- **NSERC CREATE**

- Many members of the CVR are involved in an **NSERC CREATE** initiative to establish connections with a German group. The German half of this initiative (the IRTG) is already in place, funded at around \$5,500,000. Although our application in 2012/3 was unsuccessful we are in the process of reapplying (spearheaded by Doug Crawford). Alternatives are being actively sought.

- **Ministry of Research & Innovation (MRI)**
 - Till will be applying for a new investigator award \$150K (100% for salary support of trainees, post-doc)
- **MS Society of Canada**
 - Till will be applying for an Operating Grant (fall 2013) – resubmission (~\$170,000 over 2 years)
- **CIHR**
 - Till has applied for a New Investigator Salary Award. (~\$60,000/yr)
 - Crawford has applied for approximately \$175,000.00/yr
 - Schneider has applied for an operating grant (\$775,000 over 5 yrs)
 - Murray “Medical image perception”
- **CRC**
 - Crawford is applying for renewal of his CRC chair valued at \$200,000.00/yr
- **NSERC**

CVR members are all eligible for NSERC funding. Those whose grants finish this year will be applying for renewal

 - Discovery \$25,000/yr (DeSouza)
 - Discovery (Fallah)
 - Discovery \$40,000/yr (Adler)
 - Discovery \$94,394 for 2 yrs (Till)
 - Engage \$25,000/yr (Elder)
 - Engage \$25,000/yr (Allison)
- **Alzheimer’s association (USA)**
 - Sergio applying \$7500
- **Glaucoma Research Society of Canada**
 - Steinbach is applying for \$20K, to be matched by UHN funds
- **National Institutes of Health (USA)**
 - Adler to apply for \$300,000
- **Essilor (Paris)**
 - Steinbach is applying for approx \$400K for studies of patients with central vision loss.
- **Ontario Centres of Excellence**
 - Elder is applying for a Ministry of Innovation Proof of Principle award (\$50,000)
 - Elder is applying for an OCE Technical Problem Solving award (\$25,000)
- b. **conferences, workshops, exhibits** or other events to be hosted or organized by you by April 30, 2014, and target audience

- Elder local host for the annual Configural Processing Consortium Meeting York Nov 2013. Roughly 60 participants are expected.
 - The *Applications of Vision Science* CREATE boot camp being hosted in July 2013 will bring together leading academics in the field and local industry leaders. Details of the invitees have not yet been finalized. (Organizers Wilson and Elder).
 - CVR biennial international conference June 2013. Expecting 100-200 delegates about half of whom are likely to be from outside Canada.
 - De Souza lab is working with the National Ballet School to start a *Dance for Parkinson's Program* in Sept 2013
 - Crawford will be hosting the CAPnet social at the CAN-ACN conference to be held in Toronto on May 23, 2013. The target audience is vision scientists and systems neuroscientists from across Canada.
 - The CVR Vision Science Summer School June 2013 (co-organized by Steeves and Murray); 36 attendees, including lecturers; 18 from outside York; 10 from outside Ontario; 6 from outside Canada; secured \$27,000 in funding
 - Allison and Wilcox: 2nd Toronto International Stereoscopic 3D Conference, Sept 20-23, 2013. About 250 delegates are expected.
 - Following the success of the present year, Allison and Wilcox will be organizing two more 3DFlic workshops. About 75 delegates are expected at each.
 - Stuerzlinger program chair for ACM Symposium on Spatial User Interfaces July 2013
 - Elder is organizing a session at the 2014 Annual Interdisciplinary Conference in Jackson Hole, Wyoming (Feb 2014).
- c. **knowledge mobilization/engagement/outreach/technology transfer activities** planned
- Sergio will continue her current activities – community sports teams youth testing, speaking to parents about concussion and sport, speaking to lay audiences and professionals in the Senior Care industry about functional abilities in pre- and early dementia, development of assessment tool commercially; Keynote speaker at the Nurse Practitioner's Association of Ontario annual meeting, discussing translation of clinical observations to research.
 - Elder is planning a collaboration with SportRFID (www.sportrfid.com) to develop and deploy York's patented attentive sensor technology for automatic video tracking in sporting events.
 - Bergevin will take part in "Science Rendezvous": York University outreach (May 11, 2013)

- Bergevin will mentor the awardee of the Ontario Association of Physics Teachers contest (http://www.oapt.ca/grade_11_contest/index.html)
 - Elder plans to work with MaRS Innovation to commercialize his attentive sensor technology. (US patent in 2006 and Canadian patent in 2012).
- d. **visitors** invited or anticipated
- The following people will be visiting and speaking to CVR
 - Naseem Al-Aidroos, Psychology, University of Guelph.
 - Otmar Bock (Cologne, Germany) Aug 2013
 - Frank Tong (Vanderbilt, USA) May 2013
 - Steve Palmisano (Wollongong, Australia) May 2013
 - Jay Pratt (U of T) Sept 2013
 - Pat Bennett (McMaster) Sept 2013
 - Mohat Matthen (U of T) Oct 2013
 - Michael Langer (McGill) Oct 2013
 - Ramesh Balasubramaniam (McMaster) Dec 2013
 - The Ian Howard series will be inviting at least one distinguished lecturer.
 - The following people we be our special guests at the biennial CVR conference in June 2013

<ul style="list-style-type: none"> ○ Colin Blakemore (London) ○ Anitha Pasupathy (U Washington) ○ Gunther Loffler (Glasgow, UK) ○ Vince Ferrera (Columbia) ○ Randolph Blake (Vanderbilt) 	<ul style="list-style-type: none"> ○ Julie Harris (St Andrews) ○ David Zee (Johns Hopkins) ○ Harold Bedell (U Houston) ○ Rich Krauzlis (NIH) ○ Mary Lou Jackson (Minnesota)
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 - Geoffrey Manley, Carl von Ossietzky University Oldenburg (Germany) (Bergevin)
 - Dr. Philip Grove, The University of Queensland, Australia.(Ono)
 - Dr. Ken Kihara, Kagoshima University, Japan (Ono)
 - Stephen Palmisano, Wollongong (Allison)
 - Michael Langer, McGill (Allison and Elder)
 - Deborah Giaschi, UBC, June 2013 (Wilcox)
 - Julie Harris, St. Andrews, June 2013 (Wilcox)

9. Other relevant items the Director wishes to report

Overall the CVR has maintained its extremely successful granting history during the reporting period bringing in a total of over seven million dollars this year (see appendix) and facilitating non-CVR led group grants totaling over another seven million dollars. Many large initiatives are actively being planned for next year (see section 8a). However, some grant applications submitted to CIHR, NSERC, the Multiple Sclerosis Society, Canadian Health Research Partnership and other agencies in the reporting period were not funded. Many of these applications are actively being modified in response to reviewers' comments and will be resubmitted in the upcoming year (see section 8a). CVR is operating an internal

mentoring system and is actively encouraging members to take advantage of our extensive collective experience and other advice systems, especially as pertains to CIHR, available at York.

The CVR is pleased to announce the election of its 30th member: Chris Bergevin from Physics and Astronomy. Chris brings useful skills and breadth to our ORU and is actively pursuing collaborations with other members.

The CVR is critically aware that it is not a hiring unit. However, as an important part of the fabric of York, we are anxious to cover our mandate as comprehensively as possible and are well aware that several of our more senior members may be retiring from the unit in the near future. I have contacted the chairs of the stakeholder departments to express CVR's willingness to be involved in future hires.

APPENDIX 1

List of all visitors hosted by CVR. July 1, 2012 - April 30, 2013:

Visitor	Affiliation	Country	Status	Duration of visit	Space provided?
Audrey Gottlieb	Guelph	Canada	u/g	Summer 2012	Wilkinson Lab
Markus Dahlem	Humboldt-Universität zu Berlin,	Germany	faculty	Sept, 2012	Wilson lab
Carson Chow	NIH	Germany	faculty		Wilson lab
Masahiro Kokubu	Osaka University of Health and Sport Sciences;	Japan	Faculty	Till Oct. 2012	Crawford lab
Ryan Stevenson	Vanderbilt University	USA	Postdoctoral Fellow,	Sept 2012- Nov 2012	Steeves Lab
David Pitcher	NIH	USA	Postdoctoral Fellow	Sept 2012	Steeves Lab
Fischer, T	Bielefeld	Germany	undergraduate	Oct. 1, 2012 - May 31, 2013	Tsotsos lab
Weng, Jinghua,	Tongji University Shanghai	China	PhD student	August 1, 2012 - Oct 31, 2012	Tsotsos lab
Yonetani, R	Graduate School of Informatics, Kyoto University	Japan	Research Fellow of Japan Society for the Promotion of Science	March 20 - 27, 2013.	Tsotsos lab
Jessica Grahn,	Western University	Canada	faculty	Sept 2012	DeSouza
Francesco Battaglia,	Radboud University	the Netherlands	faculty	4 days	Hoffman Lab
Alessandro Treves	SISSA	Italy	faculty	4 days	Hoffman Lab
Dr. Anne-Catherine Scherlen	Essilor International - Institut de la Vision	France	??	??	??
Philip Grove	University of	Australia	Faculty	??	Ono Lab

	Queensland				
Kamen Kanen	University of Shizuoka	Japan	Professor	January-August, 2013	Jenkin lab
Michael Dickie	Bonn-Rhein-Sieg University	Germany	Undergrad	8 months	Jenkin lab
April Ash	University of Wollongong	Australia	Visiting Endeavour Fellow (PhD)	4 months	Allison lab
Stephen Palmisano	University of Wollongong	Australia	Faculty	May 2012	Allison lab
Weina Zhu,	Yunnan University	China	Faculty	2 months	Elder Lab
Vishal Kumar,	IIT Kharagpur	India	Undergraduate	4 months	Elder Lab
Laurent Cohen	University of Paris	France	Faculty	3 May 2012	Elder
Oliver Braddick	University of Oxford	UK	Faculty	4 May 2012	Harris
Jan Atkinson	UCL	UK	Faculty	4 May 2012	Harris
Mark Wallace	Vanderbilt Uni	USA	Faculty	18 May 2012	Harris
Albert Compte	U Barcelona	Spain	Faculty	28 May 2012	Womelsdorf
Nathan Isel	Centre for mental health and addiction, Toronto	Canada	Faculty	May 2012	??
Andrew Glennerster	U Reading	UK	Faculty	June 26, 2012	Wilcox
Andre Bastos	MPI Frankfurt	Germany	Faculty	Oct 22, 2012	Womelsdorf
Carson Chow	NIH	USA	Faculty	Oct 26, 2012	Wilson
Ewa Niechwiej-Szwedo	Hospital for Sick Children	Canada	Faculty	Nov 2, 2012	Harris
Terry Sejnowski	U California	USA	Faculty	Nov 8-10, 2012	Harris
Doug Tweed	U of T	Canada	Faculty	Nov 16	Harris
Matthew Rushworth	Oxford Univ	UK	Faculty	Dec 4, 2012	Hoffman
Alessandro Treves	Trieste	Italy	Faculty	Jan 22, 2013	Hoffman
Alexandros Goulas	U Maastricht	Netherlands	Faculty	Feb 22, 2013	Womelsdorf
Randy McIntosh	Rotman	Canada	Faculty	Mar 5, 2013	Schneider
David Pitcher	NIMH	USA	Post Doc	Mar 8, 2013	Steeves
Robert Oosterveld	Donders Institute	Netherlands	Faculty	Mar 8, 2013	Womelsdorf

Dana Ballard	U Texas	USA	Faculty	Mar 12, 2013	Tsotsos, Womelsdorf
David Ostry	McGill	Canada	Faculty	Mar 15, 2013	Henriques
David van Essen	Washington U	USA	Faculty	Mar 26, 2013	??
Larry Matthies	JPL	USA	Faculty	April 19, 2013	Jenkin
Maarten Kamermans	U Amsterdam	Netherlands	Faculty	April 29, 2013	Zoidl
Kamen Kanev	University of Shizuoka	Japan	Faculty	6 months	Jenkin

APPENDIX 2

<h1 style="margin: 0;">CVR members (BEST FIVE THINGS)</h1> <p style="margin: 0;"><i>(entries not including items above)</i></p>	
Scott Adler	<ul style="list-style-type: none"> • Taught PSYC 6635 Developing the Visual Brain (Adler) • Younger, A., Adler, S.A., & Vasta, R. (2012). Child Psychology: A Canadian Perspective (3rd Edition). ISBN 978-1-1180-3391-3 Mississauga, ON: John Wiley & Sons Canada. • NIH R03 small grant \$20,000/yr for 5 yrs Development of Selective Attention in Infants as Measured by Eye Movements. • Supervised 2 masters and 2 undergrad students
Rob Allison	<ul style="list-style-type: none"> • Sakano, Y., Allison, R., and Howard, I. (2012). Motion aftereffect in depth based on binocular information. Journal of Vision, 12(1):Article 11: 1 • Tsirlin, I., Wilcox, L. M., and Allison, R. S. (2012c). Da vinci decoded: Does da vinci stereopsis rely on disparity? Journal of Vision, 12(12). • Supervised 3 masters and 3 phd students • NSERC \$34,000/yr Discovery Grant Stereoscopic surface perception in real and virtual environments • Canadian Space Agency \$100,000/yr R. Allison (PI, Palmisano co-I) Visual perception of smooth and perturbed self-motion in microgravity
Chris Bergevin	<ul style="list-style-type: none"> • Started faculty position as Asst. Prof. in Physics & Astronomy Dept. at York University • Member of CVR to explore multisensory integration • Awarded NSERC DG, allowing for setup of lab and recruitment of graduate students • Development of biophysics graduate curricula that will be relevant to CVR-affiliated students • Development of potential collaborative efforts with CVR members (e.g., Jennifer Steeves and Laurence Harris)
Doug Crawford	<ul style="list-style-type: none"> • Organizing the NSERC IRTG • National Coordinator for CAPnet • Receiving Distinguish Research Professorship to be formally awarded in June 2013 • Two Post Doctorate fellows receiving faculty positions, one in Japan and one in Ireland • Publishing 8 journal articles of the year 2012-2013 in reputed journals
Joseph DeSouza	<ul style="list-style-type: none"> • Received donation of \$20K - http://www.rcinet.ca/english/daily/interviews-2012/13-42_2013-02-04-dance-to-be-tested-as-a-therapy-for-parkinson-s/ • Our lab is working with the National Ballet School to start a Dance for Parkinson's program starting Sept 2013 • Chan JL & DeSouza JFX. (In Press) "The Effects of Attentional Load on

	<p>Saccadic Task Switching” Experimental Brain Research.</p> <ul style="list-style-type: none"> • Guest lecturer in Training school in TIMELY School on “Timing and Time Perception: Procedures, Measures, and Applications” lecturer, Corfu, Greece, February 4th to 8th, 2013. • Pynn LK & DeSouza JFX. (2013). The function of efference copy signals: implications from symptoms of Schizophrenia. <i>Vision Research</i>, 76, 124-33. doi: 10.1016/j.visres.2012.10.019
James Elder	<ul style="list-style-type: none"> • Elder, J.H., Oleskiw, T.D., Yakubovich, A. & Peyré, G. (2013). On growth and formlets: Sparse multi-scale coding of planar shape. <i>Image and Vision Computing</i> vol. 31, 1-13. (Editor’s Choice Paper) • Wagemans, J.H., Elder, J.H., Kubovy, M., Palmer, S., Peterson, M., Singh, M. & von der Heydt, R. (2012). A century of Gestalt psychology in visual perception: I. Perceptual grouping and figure-ground organization. <i>Psychological Bulletin</i>, vol. 138, no. 6 1172–1217. • Morgenstern, Y. & Elder, J.H. (2012). Local visual energy mechanisms revealed by detection of global patterns. <i>Journal of Neuroscience</i>, vol. 32, no. 11, 3679-3696. • Tal, R. & Elder, J.H. (2012) An accurate method for line detection and Manhattan frame estimation, in J.I. Park and J. Kim, eds, <i>Proc. ACCV Workshops, Part II, LNCS 7729</i>, Springer-Verlag, Berlin, 580-593. • Canadian Patent #2,386,347, <i>Attentive panoramic sensing for visual telepresence</i>, awarded September 5, 2012.
Mazyar Fallah	<ul style="list-style-type: none"> • Obtained a contract with EIMindA testing Brain Network Activation™ changes in sport-related concussion. • Commissioned to write Scholarpedia article on Neurophysiology of Visual Spatial Attention.
Laurence Harris	<ul style="list-style-type: none"> • CFI Leading Edge Fund, (\$1,977,278) Full field vision and spatial orientation (PI Laurence Harris and 9 others including Rob Allison, Laurie Wilcox, Michael Jenkin) • Harris LR, Herpers R, Jenkin M, Allison R, Jenkin H, Kapralos B, Scherfgen D, Felsner S. (2012) “The relative contributions of radial and laminar optic flow to the perception of linear self-motion” <i>Journal of Vision</i>, 12(10):7, 1–10, http://www.journalofvision.org/content/12/10/7, • Pritchett LM, Carnevale M, Harris LR (2012) “Reference frames for coding touch location depend on the task” <i>Experimental Brain Research</i> 222: 437-445 • Barnett-Cowan M, Jenkin HL, Jenkin MR, Harris LR. (2013) “Asymmetrical representation of body orientation” <i>Journal of Vision</i> 13(2): 3 • Editor in chief of new journal <i>Multisensory Research</i>
Denise Henriques	<ul style="list-style-type: none"> • My paper, Monaco et al., 2013, was my lab’s first fMRI paper conducted here at York, and is also part of international collaborations with collaborators Drs. Fiehler (Germany) and Medendorp (Netherlands) • Invited Review, Henriques and Cressman, 2013. Represents a review of my most recent research program that has received a lot of attention from the sensorimotor control community.

	<ul style="list-style-type: none"> • I went up a year early to successfully renew my NSERC Discovery grant • I was awarded a German funded research grant (from the DAAD) to cover expenses of my visit for my collaboration in Munich, Germany.
Kari Hoffman	<ul style="list-style-type: none"> • Turesson, Logothetis, Hoffman (2012) Category-selective phase coding in the superior temporal sulcus. PNAS. • Leonard, Blumenthal, Gothard, Hoffman (2012) How macaques view familiarity and gaze in conspecific faces. Behavioral Neuroscience. • NSERC Discovery Grant was renewed for 5 years • Obtained funding for new research projects from Alzheimers Association (US) and the Krembil Foundation
Ian Howard	<ul style="list-style-type: none"> • Processing vertical size disparities in distinct depth planes. Duke PA, Howard IP. J Vis. 2012 Aug 17;12(8):10. • Motion aftereffect in depth based on binocular information. Sakano Y, Allison RS, Howard IP. J Vis. 2012 Jan 17;12(1)
Richard Hornsey	<ul style="list-style-type: none"> • All my significant achievements in the reporting period are associated with the creation and establishment of the Lassonde School of Engineering.
Michael Jenkin	<ul style="list-style-type: none"> • Calce, A., Mojiri Forooshani, P, Speers, A., Watters, K., Young, T. and Jenkin, M. Autonomous aquatic agents. Proc. ICAART 2013, Barcelona, Spain, February 2013. • Nakaano, D., Lam, J., Kanev, K., Kapralos, B., Collins, K., Hogue, A. and Jenkin, M. A framework for sound localization experiments and automation. Proc. Joint. Int. Conf. on Human-Centred Computer Environments. Aizu-Wakamatsu, Japan, March 2012. • NSERC Strategic Network Grant in Field Robotics.(NFRN). \$1M/year x 5 years. Greg Dudek PI; Jenkin and Tsotsos co-Is. http://ncfrn.mcgill.ca/ • NSERC Discovery Grant \$29,000/yr • NSERC RTI Grant \$29,414
Richard Murray	<ul style="list-style-type: none"> • Murray, R. F. (2012). Classification images and bubbles images in the generalized linear model. Journal of Vision, 12(7):2, 1-8. • Murray, R. F. (2013). The statistics of shape, reflectance, and lighting in real-world scenes. In S. Dickinson and Z. Pizlo (Eds.), Shape Perception and Computer Vision: An Interdisciplinary Perspective. New York: Springer. • Murray, R. F. (2013). Human lightness perception is guided by simple assumptions about reflectance and lighting. Human Vision and Electronic Imaging XVII, San Francisco, California, February 4-7, 2013. • preparation for York CVR Vision Science Summer School 2013; co-organizing with Jennifer Steeves; 36 attendees, including lecturers; 18 from outside York; 10 from outside Ontario; 6 from outside Canada; secured \$27,000 in funding • supervision of Lisa Pritchett (minor paper) and Yonatan Moyal (honours thesis) is leading to a significant and interesting publication based on a new psychophysical method

Hiroshi Ono	<ul style="list-style-type: none"> • NSERC \$25,000/year
David Regan	<ul style="list-style-type: none"> • Awarded the Queen Elizabeth II diamond Jubilee Medal • Regan, D. Vision and Cricket.(Invited Review). <i>Ophthalmic Physiol Opt</i>, 2012,32, 257-270. • NSERC discovery grant
Josée Rivest	<ul style="list-style-type: none"> • provided neuropsychological evaluations, education, and rehabilitation to individuals suffering from brain damage to the visuo-perceptual system at the Baycrest hospital.
Keith Schneider	<ul style="list-style-type: none"> • The Dana Foundation. 2009–2012. “Directly testing the magnocellular hypothesis of dyslexia with high-resolution functional magnetic resonance imaging of the human lateral geniculate nucleus.” \$200,000/yr for 3 yrs • NSERC Discovery Grant. 2012–2016. “Structural and functional imaging of the human thalamus”. \$33,750/yr for 4 yrs • Supervised 3 phd students and 3 masters students
Lauren Sergio	<ul style="list-style-type: none"> • Hawkins KM, Sayegh P, Yan X, Crawford JD, Sergio LE (2013) Neural activity in superior parietal cortex during rule-based visual-motor transformations. <i>J.Cogn.Neurosci.</i> Mar;25(3):436-54. • Operating Grant - principal investigator, April 2013 - March 2018 \$472,549 Canadian Institutes of Health Research, Title: “Assessing functional ability following mild brain insult using cognitive-motor integration” • Concussion baseline testing and youth coordination testing, numerous youth teams in the GTA (hockey, soccer, lacrosse), continuous and ongoing;
Jennifer Steeves	<ul style="list-style-type: none"> • <i>Supervised 3 phd students and 3 masters students</i> • Kelly, K.R., Zohar, S., Gallie, B.I. & Steeves, J.K.E. (In Press). Spared contrast discrimination but impaired contrast detection and speed discrimination in people with one eye. <i>Investigative Ophthalmology and Vision Science</i>, IOVS-12-11189.R2 • Ganaden, R., Mullin, C.R. & Steeves, J.K.E. (In Press). TMS to the TOS impairs scene but not object categorization. <i>Journal of Cognitive Neuroscience</i> JOCN-2012-0372.R2. • NSERC Discovery, \$31,000/yr • Kelly, K., Gallie, B.L. & Steeves, J.K.E. (2012) Impaired face processing in early monocular deprivation from enucleation. <i>Optometry and Vision Science</i>, 89(2), 137-147.
Martin Steinbach	<ul style="list-style-type: none"> • Rehabilitating visual function in patients with central vision loss. This is having a profound effect on patients' ability to read and to become more independent. We are now developing software for making these techniques more widely available. • Tarita-Nistor, L., Lam, D., Brent, M. H., Steinbach, M. J. & Gonzalez, E. G. (2013) Courier: A better font for reading with age-related macular degeneration. <i>Canadian Journal of Ophthalmology</i>, 48, 56-62. • Tarita-Nistor, L., Mandelcorn, M. S., Steinbach, M. J., Mandelcorn, E. D., & Gonzalez, E. G. (2013) Fixation stability and location in patients with unilateral idiopathic epiretinal membrane. <i>Ophthalmic Surgery, Lasers &</i>

	<p>Imaging, 44, 46-49.</p> <ul style="list-style-type: none"> • Kanjee, R., Yucel, Y. H., Steinbach, M. J., Gonzalez, E. G., Gupta, N. (2012) Delayed saccadic eye movements in glaucoma. <i>Eye and Brain</i>, 4, 63-68.
Wolfgang Stuerzlinger	<ul style="list-style-type: none"> • W. Stuerzlinger, M. E. Latoschik, B. Kapralos, Proceedings ACM Symposium on Virtual Reality Software and Technology, ACM, 2012. • G. Bruder, F. Steinicke, W. Stuerzlinger, Touching the Void Revisited: Analyses of Touch Behavior On and Above Tabletop Surfaces, INTERACT 2013, 17 pages, in press. • D. Scheurich, W. Stuerzlinger, A One-Handed Multi-Touch Method for 3D Rotations, INTERACT 2013, 14 pages, in press. • R. Teather, W. Stuerzlinger, Pointing at 3D Target Projections with One-Eyed and Stereo Cursors, ACM CHI 2013, 10 pages, in press. • Error Behaviour in Natural User Interfaces, NSERC ENGAGE \$25,000, 2013.
Christine Till	<ul style="list-style-type: none"> • CIHR Planning Grant (Sept 2012) – obtained funding and ran 2-day meeting with over 25 participants • Supervision of Amanda Fuentes (minor area paper) lead to an interesting paper examining the relationship between memory outcomes and normalized regional brain volumes in pediatric-onset multiple sclerosis patients (published in <i>Journal of International Neuropsychological Society</i>, 2012). • Submission of three operating grants as PI (NSERC, CIHR, MS Society), two grants as a co-investigator (National MS Society; and NIH K23 Career Development Proposal for Dr. Waldman) plus one CIHR New Investigator Award application in 2012-13. • York University, Magnetic Resonance Imaging (MRI) Operations, Committee Member • Continued MRI scanning of neurologic patients at the York University Neuroimaging Laboratory and development of new research collaborations related to fMRI project.
John Tsotsos	<ul style="list-style-type: none"> • Andreopoulos, A., Tsotsos, J.K., A Computational Learning Theory of Active Object Recognition Under Uncertainty, <i>International Journal of Computer Vision</i>, p1-48, 2012 (online August 7, 2012). • Rodriguez-Sanchez, A., Tsotsos, J.K, The roles of endstopped and curvature tuned computations in a hierarchical representation of 2D shape, <i>Public Library of Science (PLoS) ONE</i>, available online 8/9/2012. http://dx.plos.org/10.1371/journal.pone.0042058. • Theses completed during reporting period: <ul style="list-style-type: none"> ○ Fazl, E., Visual Place Categorization for Mobile Robots, Sept. 2012 (PhD) ○ Wloka, C., Integrating Overt and Covert Attention Using Peripheral and Central Processing Streams, Oct. 2012. (MSc) Awarded 2012 Joseph Liu Best M.Sc. Thesis Award, Department of Computer Science & Engineering, York University

	<ul style="list-style-type: none"> • Tsotsos, J.K., Re-visiting visual routines, Neuroscience 2012, New Orleans, Oct. 2012
Laurie Wilcox	<ul style="list-style-type: none"> • NSERC Discovery \$40,000/yr • NSERC RTI \$39,000 • <i>Supervised 3 PhD and 2 Masters students</i> • Tsirlin I, Wilcox LM, Allison RS (2012) Da Vinci decoded: Does da Vinci stereopsis rely on disparity? Journal of Vision 12 (12), 1-17. • Tsirlin I, Allison RS, Wilcox LM (2012) Perceptual asymmetry reveals neural substrates underlying stereoscopic transparency. Vision Research, 54, 1-11.
Richard Wildes	<ul style="list-style-type: none"> • Action spotting and recognition based on a spatiotemporal orientation analysis (with K. Derpanis, M. Sizintev and K. Cannons). IEEE Transactions on Pattern Analysis and Machine Intelligence, to appear, 2013. • Spacetime texture representation and recognition based on a spatiotemporal orientation analysis (with K. Derpanis). IEEE Transactions on Pattern Analysis and Machine Intelligence 34 (6), 1193-1205, 2012. • Spatiotemporal stereo and scene flow via stequel matching (with M. Sizintsev) IEEE Transactions on Pattern Analysis and Machine Intelligence 34 (6), 1206-1219, 2012. • Dynamic scene understanding: The role of orientation features in space and time in scene classification (with K. Derpanis, M. Lecce and K. Daniilidis). In Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2012. • Became associate director of the CVR
Frances Wilkinson	<ul style="list-style-type: none"> • Thabet Wilkinson, F., Wilson, H.R. & Karanovic, O. (2013) The locus of flicker adaptation in the migraine visual system: A dichoptic study. Cephalalgia, 33(1), 5-19;doi: 10.1177/0333102412462640 • Gorbet, D., Wilkinson, F, & Wilson, H.R. (2012) An fMRI examination of the neural processing of periodic motion trajectories by the human visual system. Journal of Vision, 12(11): 5;doi:10.1167/12.11.5 • active participant in local chapter of Illuminating Engineering Society; - this has provided me with a network of lighting professionals • <i>CTV interview about Migraine and Lighting Research Jan 3, 2013</i> http://www.ctvnews.ca/video?clipId=836684
Hugh Wilson	<ul style="list-style-type: none"> • Thabet, M., Wilkinson, F., Wilson, H.R. & Karanovic, O. (2013) The locus of flicker adaptation in the migraine visual system: A dichoptic study. <i>Cephalalgia</i>, 33, 5-20. • Wilson, H. R. & Wilkinson, F. (2013) Configural pooling in the ventral pathway. In <i>The New Visual Sciences</i>, ed. by J. Werner & L. Chalupa, MIT Press, Cambridge, MA. In press. • Wilson, H. R. (2013) Binocular rivalry: cooperation, competition, and decisions. In <i>The Constitution of Consciousness</i>, ed. by S. Miller. In press. • Or, C-F & Wilson, H. R. (2013) Implicit face prototype learning from geometric information. <i>Vision Res.</i> 82, 1-12. • Vesker, M. & Wilson, H. R. (2013) Face Context Advantage Explained by

	<p>Vernier and Separation Discrimination Acuity. <i>Frontiers in Perception Science</i>. DOI=10.3389/fpsyg.2012.00617.</p>
<p>Thilo Womelsdorf</p>	<ul style="list-style-type: none"> • Publication: - Womelsdorf, T., Lima, B., Vinck, M., Neuenschwander, S., Oostenveld, R., Singer, W. & Fries, P. (2012) Orientation selectivity and noise correlation in awake monkey V1 are modulated by the gamma cycle. PNAS, Proceedings National Academy of Science, USA. 13; 109(11): 4302–4307. • CIHR New Investigator Award • Ontario Early Researcher Award • Matlab analysis workshop attracting >45 people across Canadian's Universities • Realization and Organization of the New Systems and Computational Neuroscience Speaker Series at York University, see: http://syscomp.apps01.yorku.ca/

Appendix 3 – Individual Member Contributions

List of publications, HQP and grants

Active members (PUBLICATIONS)	
<i>(note: collaborative papers may appear multiple times)</i>	
Scott Adler	<ul style="list-style-type: none"> • Younger, A., Adler, S.A., & Vasta, R. (2012). <i>Child Psychology: A Canadian Perspective</i> (3rd Edition). ISBN 978-1-1180-3391-3 Mississauga, ON: John Wiley & Sons Canada.
Rob Allison	<ul style="list-style-type: none"> • Allison, R., Irving, E., Babu, R., Lillakas, L., Guthrie, S., and Wilcox, L. (2012a). Visibility of color breakup phenomena in displays based on narrowband spectral sources. <i>IEEE Journal of Display Technology</i>, 8(4):186 – 193. • Allison, R., Zacher, J. E., Kirolos, R., Guterman, P., and Palmisano, S. (2012b). Perception of smooth and perturbed vection in short-duration microgravity. <i>Experimental Brain Research</i>, 223(4):479–487. • Banks, M. S., Read, J. R., Allison, R. S., and Watt, S. J. (2012). Stereoscopy and the human visual system. <i>SMPTE Motion Imaging</i> (also appears in <i>SMPTE International Conference on Stereoscopic 3D for Media and Entertainment Conference proceedings</i>), 121(4):24–43. • Guterman, P., Allison, R. S., Palmisano, S., and Zacher, J. E. (2012). Influence of head orientation and viewpoint oscillation on linear vection. <i>Journal of Vestibular Research</i>, 22(2-3):105–116. • Harris, L. R., Herpers, R., Jenkin, M., Allison, R. S., Jenkin, H., Kapralos, B., Scherfgen, D., and Felsner, S. (2012). The relative contributions of radial and laminar optic flow to the perception of linear self-motion. <i>Journal of Vision</i>, 12(10). • Rushton, S. and Allison, R. (in press). Biologically-inspired heuristics for human-like walking trajectories toward targets and around obstacles. <i>Displays</i>. • Sakano, Y., Allison, R., and Howard, I. (2012). Motion aftereffect in depth based on binocular information. <i>Journal of Vision</i>, 12(1):Article 11: 1. • Tsirlin, I., Allison, R., and Wilcox, L. (2012a). The effect of crosstalk on depth magnitude in thin structures. <i>Journal of Electronic Imaging</i> (an earlier version also published in <i>Electronic Imaging 2012: Stereoscopic Displays and Applications</i>), 21:011003. • Tsirlin, I., Allison, R., and Wilcox, L. (2012b). Perceptual asymmetry reveals neural substrates underlying stereoscopic transparency. <i>Vision Research</i>, 54(1):1–11. • Tsirlin, I., Wilcox, L. M., and Allison, R. S. (2012c). Da vinci decoded: Does da vinci stereopsis rely on disparity? <i>Journal of Vision</i>, 12(12). • Benzeroual, K., Allison, R. S., and Wilcox, L. (2012). 3d display size

	<p>matters: Compensating for the perceptual effects of S3D display scaling. In IEEE Computer Society Conference on Computer Vision and Pattern Recognition, 3DCine Workshop (CVPRW), pages 45–52, Providence, Rhode Island.</p> <ul style="list-style-type: none"> • Chen, J., Benzeroual, K., and Allison, R. S. (2012). Calibration for high-definition camera rigs with marker chessboard. In IEEE Computer Society Conference on Computer Vision and Pattern Recognition, 3DCine Workshop (CVPRW), pages 29–36, Providence, Rhode Island. • Laldin, S., Wilcox, L., Hylton, C., and Allison, R. (2012). Motion in depth constancy in stereoscopic displays. In Electronic Imaging: Stereoscopic Displays and Applications, volume 8288, pages 82880N1–82880N11. SPIE-Int Soc Optical Engineering. • Tsirlin, I., Allison, R., and Wilcox, L. (2012). Crosstalk reduces the amount of depth seen in 3d images of natural scenes. In Electronic Imaging: Stereoscopic Displays and Applications, volume 8288, pages 82880W–82880W–9. SPIE-Int Soc Optical Engineering. • Vinnikov, M. and Allison, R. S. (in press). Gaze-contingent simulations of visual defects in virtual environment: Challenges and limitations. In CHI 2013 Workshop "Gaze Interaction in the Post- WIMP World, page in press, Paris, France.
Chris Bergevin	<ul style="list-style-type: none"> • Obtaining reliable phase-gradient delay trends from otoacoustic emission data (2012) Shera CA & Bergevin C J. Acoust. Soc. Am. (JASA) 132(2):927-943
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Rob Allison	Sidrah Laldin (Master's) Jianhui Chen (Master's) Ramy Kirollos (Master's) Andrew Roth (Master's) Natalia Bogdan (PhD) Margarita Vinnikov (PhD) Pearl Guterman (PhD) Karim Benzeroual (PDF with Wilcox) Arthur Lugtigheid (PDF with Wilcox) Mariam Sardar (undergraduate)
Chris Bergevin	Anthony Salerno (undergrad) Fidan Gasumova (undergrad) Claudio (Andrew) Tersigni (undergrad) Kevin Cross (undergrad)
Doug Crawford	Pankhuri Malik; MSc; Bio 09/11- Present David Cappadocia; PhD; Kin 06/11- Present Mehdi Daemi; PhD; Biol; 09/10- Present Leiko Tanaka; MA; Psych 09/10- Present Morteza Sadeh; MSc; Kin 09/10- Present Noura Al-Omawi; PhD; Kin 09/10- Present Amirsaman Sajad; PhD; Bio 09/11- Present Ying Chen; PhD; Kin 04/10- Present Robert Marino; Post Doc 04/12- Present Benjamin Dunkley; Post Doc 11/11-Present Bhavya Sharma; Work Study Student 05/12-Present Armin Abadeh; Research Assistant 11/12-Present Khashayar Gharavi; Independent Study Psychology 09/11-Present Sina Alipour-Nazari; honours thesis student (PSYC 4000) 05/12 – Present Jacobus Joost Dessing; Post Doc 09/08-10/12 Suryadeep Dash; Post Doc 09/08-03/13
Joseph DeSouza	Arsenyan, Diana: M.Sc. Biology. 2010-13 Olshansky, Michael: M.A. Psychology. 2012-14 Leger, Charles: M.A. Psychology.. 2012-14 Levkov, Gabriela Rose: M.Sc. Biology. 2012-14 Savija, Nevena: M.Sc. Biology. 2012-14 Leung, Samantha: M.Sc. Biology co-supervised 2011-13 Tharani, Hedieh Undergrad 2012-13 GORANSON AWARD Petina, Karina: Undergrad 2012-13 Bar, Rachel Undergrad 2011-12 GORANSON AWARD Soiezi, Matin: 2011-12 GORANSON AWARD
James Elder	Yuen Lau (undergraduate) Oyinda Daramola (undergraduate) Galina Goren (undergraduate) Ying Li (M.Sc. candidate) CSE Alex Yakubovich (M.A candidate) Math Paria Mehrani (Ph.D candidate) CSE

	Eduardo Corral Soto (Ph.D candidate) CSE Vida Movahedi (Ph.D candidate) CSE Ingo Frund (Post doctoral fellow) Jan Drewes (Post doctoral fellow)
Mazyar Fallah	Carolyn J. Perry – PhD student Massie Rahim (undergrad) Abdullah Tahir (undergrad) Ravi Chaudhari (undergrad) Dennis Jiang (undergrad) Paul Dhami (undergrad) Puneet Arora, BSc
Laurence Harris	Lisa Pritchett (PhD candidate) Adria Hoover (PhD candidate) Charles Mander (PhD candidate) Sarah D’Amour (MA candidate) Lindsey Fraser (MA candidate) Michael Carnevale (MA candidate) Bahar Hashemi (undergrad) Emma Walker (undergrad)
Denise Henriques	Nilufer Nourouzpour (KAHS MSc candidate, Sept 2012) Victoria Barkley (Psych MSc candidate, Sept 2012) Holly Clayton (Psych PhD candidate, 2012-present) Danielle Salomonczyk (Psych PhD candidate, 2009-present) Ahmed Mostafa (visiting PhD candidate from Egypt, 2011-present) Simona Monaco (Postdoctoral fellow, 2010-present) Rozbeh Kamran (Biol undergrad)
Kari Hoffman	Tim Leonard (grad) Ben Cassidy (grad) Michelle Dragan (grad) Rodrigo Montefusco (post doc) Jonathan Mikkila (undergrad) Sonya Chand (undergrad)
Richard Hornsey	Tsun-Hsung Tsai, PhD completed 2012 Cyrus Minwalla, PhD student. Phillip Rolle (undergrad) Stanley Lio(undergrad)
Michael Jenkin	Jing Yang, PhD Computer Science. Expected to graduate this summer Hui Wang, PhD Computer Science, Expected to graduate this summer Parisa Mojiri, MASc Computer Engineering, Expected to graduate this summer Andrew Hogue, PhD Computer Science, in 2nd year Michael Dickie, Visiting student from BRS.
Richard Murray	Yonatan Moyal, undergraduate Psychology, honours thesis supervisor (2012 - present)
Hiroshi Ono	Ashley Chung-Fat-Yim (Psych, MA grad student) Faraz Honarparver (Psych undergrad) Abdullah Jamal (Psych undergrad)

	Aren Bedrosyan (Psych undergrad)
Keith Schneider	Larissa McKetton, PhD Biology Monica Giraldo, visiting PhD Scott Munro, MA Psychology Joseph Viviano, MSc Biology Debra Soh, PhD Psychology Kevin DeSimone, PhD Psychology Anahit Grigorian, Biology Undergrad Andrew Quach, Biology Undergrad Josee Smith, Undeclared Undergrad Illhan Ali, Biology Undergrad Miguel Sanchez, Biology Undergrad Rawan Abou Zid, Biology Undergrad Roshan Boodram, Biology Undergrad
Lauren Sergio	Joshua Granek (Ph4), Patricia Sayegh (PhD3), Kara Hawkins (PhD3), Jeffrey Brown (MSc2), David Albines (MSc1), Jasmeet Cheema (MSc1), Christina Rubino (BSc4), Zaid Faiz (BSc4), Tonima Khan (BSc4), Zahra Moghei (BSc4), Melissa Ruinsky(BSc4)
Jennifer Steeves	Caitlin Mullen, Dept of Psychology, PhD candidate Krista Kelly, Dept of Psychology, PhD candidate Stefania Moro, Dept of Psychology, PhD candidate Rachel Ganaden, Dept of Psychology, MA candidate Lily Solomon-Harris, MA candidate Alex Giffard, MA candidate. Sarah Zohar, Psych Undergrad Thesis student, summer NSERC Joshua Lipczyc, , Psych Undergrad Independent Study student, summer NSERC Sonya Chand, NSERC CREATE summer student
Martin Steinbach	Chantel Donald (undergrad)
Wolfgang Stuerzlinger	Andriy Pavlovych, postdoc Rob Teather, PhD student Arindam Das, PhD student Ahmed S. Arif, PhD student Loutfouz Zaman, PhD student Navid Mohaghegh, PhD student Doug Scheurich, MSc student Michelle Brown, MSc student Domokos Papoi, MSc student

	Bhavna Agarwal, MSc student (graduated in early 2013) Paul Bergmanis, MSc student, interdisciplinary program
Christine Till	Magdalena Lysenko, MA 2 (Psych, York U), Sept. 2011 – present Bravina Bala, PhD 3 (Psych, York U), Sept. 2008 – present Ameeta Dudani, PhD 3 (Psych, York U), Sept. 2008 – present Nadine Akbar, PhD 2 (Inst. Medical Sciences, UoT), Sept 2011 – present
John Tsotsos	Rothenstein, A. (post doc) Jan. 2011 - Dec. 2012 (Simine, E.,(Research Associate) Jan. 2007 - present Wang, B. (Research associate) May 2012 - present Leung, E., (PhD candidate) Jan, 2005 - present. Shi, X., (PhD candidate) Sept. 2006 - present. Wloka, C., (PhD candidate) Jan. 2012 - present Kotseruba, I., (MSc candidate) Sept, 2012 - present Rasouli, A., (MSc candidate) Sept. 2012 - present Voland, S., (MSc candidate) May 2012 -present (co-supervisor J. Edmonds) Fischer, T., undergraduate from U of Bielefeld, Germany, Oct. 1, 2012 - May 31, 2013 (co-supervisor H. Gross).
Laurie Wilcox	Stransky D (Phd candidate) Tsirlin I (PhD candidate) Cary A (MA candidate) Deas L (PhD candidate)
Richard Wildes	Mikhail Sizintsev (PhD) winner of the 2012 Canadian Image Processing and Pattern Recognition Society (CIPPRS) Doctoral Dissertation Award Elle Ameli (UG candidate) Hang Gao (MSc candidate) Sepehr Vosoughi (MSc candidate) Hao Zhong (MSc candidate)
Frances Wilkinson	Diana Gorbet (post-doctoral fellow) Alexandra Markham (graduate student) Audrey Gottlieb (undergraduate – U of Guelph) Yousra Haque (Undergraduate)
Hugh Wilson	Xiaoqing Gao (Postdoc) Diana Gorbet (jointly with Fran Wilkinson) Michael Vesker (M.Sc., 2013) Marwan Daar (Ph.D. student)
Thilo Womelsdorf	MSc candidate (2nd year)- Chen Shen PhD candidate (1st year) - Mariann Oemisch PhD candidate (2nd year) - Matthew Balcarras Postdoc - Stephanie Westendorff Postdoc - Salva Ardid Postdoc - Cristiano Micheli

CVR members (GRANTS)

TOTALS: \$7,390,277 from individual and CVR-led group grants brought in during the reporting period including \$1,524,139 (NSERC), \$1,149,770 (CIHR); plus CVR members have facilitated \$7,135,333 in non-CVR-led group grants.

Group grants:

Led by CVR members

- NSERC CREATE Training Grant (4/2011 to 4/2017) “Vision Science and Applications” Total Direct Costs: \$1,650,000 (PI Wilson, 9 others including Elder, Steeves, Allison, Harris)
- CFI Leading Edge Fund, (\$1,977,278) Full field vision and spatial orientation (PI Harris and 9 others including Allison, Wilcox, Jenkin)
- OMDC \$100,000/yr (PI Allison plus 5 others including Wilcox) Entertainment and Creative Cluster Partnerships Fund, The 3D Film Innovation Consortium (3D FLIC): Phase II
- NSERC \$95,612/yr (Wilcox PI; Allison co-I plus 1 other) New Media Initiative: Motion in Depth

Including CVR members (PI non-CVR)

- 2009-2015 NSERC \$300,000/yr CREATE Program in Computational Approaches to Sensorimotor Transformations for the Control of Action renamed to "CAN-ACT: Computational Approaches in Neuroscience - Action, Control & Transformations (PI Mel Goodale, Western, 9 others including Wolfgang Stuerzlinger, Doug Crawford and Denise Henriques from the CVR)
- ORF/RE \$768,965/yr (Total \$3,844,826) (PI A. Asif; Rob Allison and Wolfgang Stuerzlinger and John Tsotsos Co-Is plus 14 others) Ontario Research Fund/Research Excellence, Centre for Innovation in Information Visualization and Data Driven Design (CIV/DDD)
- NSERC Strategic Network Grant in Field Robotics.(NFRN). \$1M/year x 5 years. Greg Dudek PI; Jenkin and Tsotsos co-Is. <http://ncfrn.mcgill.ca/>
- Interactive Games Ontario 3D (iGO3D), OMDC Entertainment and Creative Cluster Partnerships Fund, (PI A. Hogue UOIT; Allison, Stuerzlinger and 6 others) \$124,872/yr (total \$635,000) 2011-2012.
- Graphics, Animation, and New Media (GRAND), Network of Centres of Excellence, Artistic & Technical Approaches to Content Creation & Display for Stereo 3D and Other Novel Media (PI: K. Booth; includes Allison, Stuerzlinger, Wilcox and 46 others) CA \$23,250,000 over 7 years, 2010-2015.
- Multiple Sclerosis (MS) Scientific Research Foundation “The clinical-demographic, epidemiology, pathobiology and neuroimaging features of acute demyelination in Canadian children (PI Banwell, B; co-PIs: Bar-Or, A, Sadovnick, D, Marie, R.A., Arnold, D; Co-investigators: C. Till , F. Costello) \$4,653,000 over 3 years (2010-2013)
- Heart and Stroke Foundation (PI Avril Mansfield and Jenny Campos, co-I Laurence Harris, Toronto Rehab) \$69,067 (1yr)

Scott Adler	<ul style="list-style-type: none"> • NIH R03 small grant \$20,000/yr for 5 yrs Development of Selective Attention in Infants as Measured by Eye Movements.
Rob Allison	<ul style="list-style-type: none"> • Australian Research Council \$68,000/yr Palmisano (PI; Allison, Co-I) Viewpoint changes during locomotion: Their role in self-motion perception and motion sickness • NSERC \$34,000/yr Discovery Grant Stereoscopic surface perception in real and virtual environments • Canadian Space Agency \$100,000/yr R. Allison (PI, Palmisano co-I) Visual perception of smooth and perturbed self-motion in microgravity • NSERC \$39,209 L. Wilcox (PI, Allison co-I) Research Tools and Instruments, Apparatus for assessment of natural stereoscopic vision • OCE \$2,000 Industry Academic Networking Event Fund (Joint Application with Sheridan, 3DOntario Portal • CFI \$320,000 A. Kazimi (PI, Allison co-I) Leader's Opportunity Fund, Stereoscopic 3D Lab
Chris Bergevin	<ul style="list-style-type: none"> • NSERC DG "Biophysical Mechanisms Underlying Auditory Transduction" \$29k/year for 5 years
Doug Crawford	<ul style="list-style-type: none"> • 2011-2016 NSERC Discovery \$110,000/yr "Cortical Mechanisms for Trans-Saccadic Integration and Memory in the Human" • 2009-2014 CIHR \$150,170/yr "Mechanisms for Eye-hand Coordination in the Human" • 2007-2012 CIHR \$209,440/yr "Spatial Transformations of 3-D gaze" • 2007-2014 Tier I CRC (CIHR) \$200,000/yr "CRC in Visual-Motor Neuroscience"
Joseph DeSouza	<ul style="list-style-type: none"> • 2012-13 NSERC Discovery program Attentional signals during visuomotor tasks (PI) \$25,000 • 2012-13 Iripini Club Implications of Dance for Parkinson's research (PI) \$20,000 • 2012-15 Canadian Foundation for Innovation (CFI) \$118,137/yr for 3 yrs
James Elder	<ul style="list-style-type: none"> • Research Team Lead, Centre for Innovation in Information Visualization and Data-Driven Design, Dynamic Carbon Activity Mapping in Urban Environments (\$25,000) • Principal Investigator, Natural Sciences and Engineering Research Council (NSERC) Discovery Grant Hierarchical systems for visual shape perception (\$42,000/yr for 5yrs) • Project Leader, Ontario Centres of Excellence Earth and Environmental Technologies (OCE-ETech), Three-Dimensionalizing Surveillance Networks (\$145,503/yr for 3yrs) • Project Leader, Geomatics for Informed Decisions (GEOIDE), Three-Dimensionalizing Surveillance Networks (\$242,500/yr for 3yrs)
Mazyar Fallah	<ul style="list-style-type: none"> • Contract with ElMindA testing Brain Network Activation™ changes in sport-related concussion. Equipment, service contracts, and

	consumables (~\$200k)
Laurence Harris	<ul style="list-style-type: none"> • NSERC discovery grant. \$50k/yr • NSERC RTI \$35,000 • CSA (Space Sciences Enhancement program) \$66,000/yr • CSA/ESA (Bedrest study) \$4,000 • Humboldt Foundation (PI Rainer Herpers, with Michael Jenkin) €10,000/yr
Denise Henriques	<ul style="list-style-type: none"> • NSERC Discovery Grant Project: Sensory and motor plasticity in learning \$40,000/yr • Duetscher Akademischer Austauschdienst German Academic Exc, Research Visit Grant (3 months) Project: The role of the cerebellum in multisensory integration and motor learning \$7,500
Kari Hoffman	<ul style="list-style-type: none"> • NSERC Discovery grant \$30,000/yr • Alzheimers Association award \$50,000/yr for 2 yrs • Ontario MRI Early Researcher Award \$30,000/yr for 2008-2013 • Krembil Foundation \$300,000/yr for 1.5 yrs
Richard Hornsey	<ul style="list-style-type: none"> • NSERC Discovery grant Distributed Sensor Systems and Image Sensor Clouds \$21,000/yr
Michael Jenkin	<ul style="list-style-type: none"> • NSERC Discovery Grant \$29,000/yr • NSERC RTI Grant \$29,414
Richard Murray	<ul style="list-style-type: none"> • NSERC Discovery Grant, \$24,000/year • Infrastructure Operating Fund, \$16,200 for 2013-2016 • Séjour Scientifique de Haut Niveau, Ambassade de France au Canada, \$2,000
Hiroshi Ono	<ul style="list-style-type: none"> • NSERC \$25,000/year
David Regan	<ul style="list-style-type: none"> • NSERC Discovery grant. \$31,000/yr
Keith Schneider	<ul style="list-style-type: none"> • The Dana Foundation. 2009–2012. “Directly testing the magnocellular hypothesis of dyslexia with high-resolution functional magnetic resonance imaging of the human lateral geniculate nucleus.” \$200,000/yr for 3 yrs • NSERC Discovery Grant. 2012–2016. “Structural and functional imaging of the human thalamus”. \$33,750/yr for 4 yrs
Lauren Sergio	<ul style="list-style-type: none"> • CIHR “Assessing functional ability following mild brain insult using cognitive-motor integration” Operating Grant \$98,000/yr over 5 yrs • Ontario Centres for Excellence Technical Problem Solving Industry/Academia collaboration, “BrainFx 360 Assessment: Clinical Validation” \$3000 • CIHR Café Scientifique, “Can your cellphone save the healthcare system” (with Paul Ritvo, Gord Flett, and Southlake Regional Health Centre) Apr 2011 Mar 2016 \$155,000 • NSERC Discovery “Brain mechanisms for eye-hand coordination: Experience- and sex-related differences” \$31,000/yr

	<ul style="list-style-type: none"> • Research coordinator salary support – January 2013-2014, Donald Sanderson Memorial Fund, \$10,000 (coordinates youth team testing)
Jennifer Steeves	<ul style="list-style-type: none"> • NSERC Discovery, \$31,000/yr
Martin Steinbach	<ul style="list-style-type: none"> • NSERC Operating Grant: Human Ocular Motor Control (\$27,000 p.a.)
Wolfgang Stuerzlinger	<ul style="list-style-type: none"> • Error Behaviour in Natural User Interfaces, NSERC ENGAGE \$25,000, 2013. • Touch the Third Dimension: Simple-To-Use Three-Dimensional User Interfaces, NSERC Discovery Grant, \$14,000/yr, 2012-2013.
Christine Till	<ul style="list-style-type: none"> ○ Scottish Rite Charitable Foundation (SRCF) of Canada Structural and functional neuroimaging correlates of cognitive impairment in childhood-onset multiple sclerosis. Co-investigators: B. Banwell, S.. Narayanan \$35,000/yr for 3 yrs ○ CIHR Planning Grant “Multimodal complex data analyses of structural and functional magnetic resonance imaging in pediatric multiple sclerosis” Co-Principal Investigator: B. Banwell, C. Till \$15,000
John Tsotsos	<ul style="list-style-type: none"> • Canada Research Chair \$200,000 • NSERC Discovery Grant \$60,3000/yr • York U \$44,250
Laurie Wilcox	<ul style="list-style-type: none"> • NSERC Discovery \$40,000/yr • NSERC RTI \$39,000 (Allison co-I)
Richard Wildes	<ul style="list-style-type: none"> • NSERC Discovery \$22,000/yr • OCE TSP \$25,000/yr • NSERC Engage \$25,000/yr
Frances Wilkinson	<ul style="list-style-type: none"> • NSERC - Behavioural and Imaging Studies of Face and Object Perception – Discovery Grant (PI) \$39,000/yr
Hugh Wilson	<ul style="list-style-type: none"> • CIHR Operating Grant (7/2007 to 7/2012) PI “Face Recognition Across Head Orientations: Perception & Brain Imaging” Total Direct Costs: \$91,000/yr for 5 yrs • NSERC Operating Grant (4/2010 to 4/2015) PI “Visual Discrimination and Learning of Motion Trajectories” Total Direct Costs: \$64,100/yr for 5 yrs • Canadian Institute for Advanced Research (6/2009-6/2014)) Fellow, Program in Neural Computation and Perception Total Direct Costs: \$30,000/yr for 5 yrs

<p>Thilo Womelsdorf</p>	<ul style="list-style-type: none"> • CFI Attentional Control Functions in Neuronal Microcircuits and Large Scale Brain Networks. Leaders Opportunity Fund \$317,000 • CIHR New Investigator, Canadian Institutes of Health Research. Neuronal mechanisms underlying the emergence of selective attentional control. \$60,000/yr • NSERC Discovery Grant \$32,000 /yr • NSERC RTI \$60,750. • Ontario Ministry of Economic Development and Innovation (MEDI). Early Researcher Award Elucidating how attention is controlled by networks of brain cells \$28,000/yr • CIHR Operating Grant, Neuronal mechanisms underlying the emergence of selective attentional control. \$171,160/yr
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