

# CENTRE FOR VISION RESEARCH

York University, North York, Toronto, Ontario, M3J 1P3

Annual Report, July 1991 to July 1992

## Faculty

- John Amanatides      Assistant Professor of Computer Science.  
Research Associate in the Human Performance in Space Laboratory.  
Interests: robotics.
- Otmar Bock             Senior Scientist in the Human Performance in Space Laboratory.  
Adjunct Professor of Psychology.  
Interests: intersensory and sensory-motor coordination and robotics.
- Howard Flock Professor of Psychology.  
Interests: perception of brightness, visual surfaces and spatial arrangements.
- Keith Grasse          Associate Professor of Psychology and Biology.  
Principal Investigator in the Human Performance and Space Laboratory.  
Interests: neurophysiology of the visual system, eye movements, auditory neurophysiology, neuropharmacology
- Laurence Harris      Associate Professor of Psychology.  
Investigator in the Human Performance and Space Laboratory.  
Interests: electrophysiology of the vestibular and oculomotor systems.
- Peiyuan He             Scientist in the Human Performance in Space Laboratory.  
Adjunct Assistant Professor in Psychology.  
Interests: neuromagnetometry of visual and auditory evoked magnetic brain activity, visual evoked potentials; eye movements.
- Ian Howard             Professor of Psychology and Biology.  
Co-Director of the Human Performance in Space Laboratory.  
Interests: space perception, eye movements, visual-vestibular interactions.
- Michael Jenkin        Associate Professor of Computer Science.  
Research Associate in the Human Performance in Space Laboratory.  
Interests: computer vision, robotics and image understanding.
- Peter Kaiser            Professor of Psychology and Biology.  
Interests: colour vision, sensory processes, physiological optics, human factors.
- Evangelos E. Milios   Associate Professor of Computer Science.  
Interests: computer vision, robotic hand-eye coordination, mobile robot navigation.
- Masao Ohmi            Scientist in the Human Performance in Space Laboratory.  
Adjunct Assistant Professor of Psychology.  
Interests: oculomotor system and visual-vestibular interactions.
- Hiroshi Ono            Professor of Psychology.  
Principal Investigator in the Human Performance in Space Laboratory.  
Interests: the visual perception of direction and distance; eye movements.

Jonathan Ostroff      Associate Professor of Computer Science.  
Research Associate in the Human Performance in Space Laboratory.  
Interests: computer-graphics.

**Faculty cont'd**

- David Regan Professor of Psychology and Biology at York University.  
Professor of Ophthalmology and Medicine at the University of Toronto.  
Co-Director of the Human Performance in Space Laboratory.  
Killam Fellow.  
Interests: psychophysics of spatial vision, motion, stereopsis, colour vision; vision aviation; visually evoked magnetic and electrical brain activity; visual disorders; auditory psychophysics.
- Minas Spetsakis Assistant Professor of Computer Science.  
Research Associate in the Human Performance in Space Laboratory.  
Interests: computer vision and robotics.
- Paul Stager Professor of Psychology.  
Research Associate in the Human Performance in Space Laboratory.  
Interests: Human factors in aerospace performance and system design.
- Martin Steinbach Professor of Psychology and Biology.  
Associate Director of the Eye Research Institute of Ontario.  
Adjunct Professor of Ophthalmology, University of Toronto.  
Senior Scientist, Dept. of Ophthalmology, Hospital for Sick Children.  
Director of Research, Department of Ophthalmology, University of Toronto.  
Interests: eye movements; visual-motor coordination; clinical disorders of the oculomotor system.

**Visiting Scientists 1991-92**

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|---------------------|---|
| Dr. Richard Abadi   | Manchester University, England                                    |
| Dr. Sten Bergström  | Department of Psychology, Umeå, Sweden                            |
| Dr. John Findlay    | Department of Psychology, Durham University                       |
| Dr. Walter Gogel    | Department of Psychology, University of California, Santa Barbara |
| Dr. Yaso Nakano     | Tokyo Institute of Technology                                     |
| Dr. Brian Rogers    | Oxford University   |
| Dr. Robert O'Shea   | Otago University, New Zealand                                     |
| Dr. Andrew Smith    | Psychology Department, Cardiff University                         |
| Dr. Henk Spekreisje | Netherlands Inter-University Eye Institute, Amsterdam.            |
| Dr. Jonathan Victor | Rockefeller University  |
| Dr. Keiji Uchikawa  | Tokyo Institute of Technology                                     |

**Visiting Scientists 1992-93**

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|-------------------|--------------------------|
| Dr. Richard Abadi | Working with I.P. Howard |
| Dr. M. Swanston   | Working with H. Ono      |
| Dr. N. Wade       | Working with H. Ono      |
| Dr. B. Gilliam    | Working with H. Ono      |
| Dr. H. Hefter     | Working with O. Bock     |
| Dr. Y. Nakano     | Working with P. Kaiser   |
| Mr. T. Mihashi    | Working with D. Regan    |

## **Research Associates**

Dr. Karin Arnold	Working with O. Bock
Dr. Esther Gonzalez	Working with M. Steinbach
Xiang-Hua Hong	Working with D. Regan
Dr. John Lipitkas	Working with O. Bock
Dr. Marian Regan	Working with D. Regan
Mr. T. Mihashi	Working with D. Regan

## **Post Doctoral Fellows**

Li Sun	Working with I. Howard
Hiroyasu Ujike	Working with H. Ono
Laura Telford	Working with I. Howard
T. Simpson	Working with D. Regan
Honguy Zhang	Working with L. Harris
Hirohiko Kaneko	Working with I. Howard
Piotr Jasiobedzki	Working with E. Milios at U. of T.

## **Graduate students (supervisors)**

Richard Bird(Howard)	Obtained M.A, September, 1991
Ken Casselman (Grasse)	3rd year M.A.
Laura Childerson	3rd year M.A., U of T. working with I. Howard
Jeremy Cooperstock(Milios)	Obtained M.Sc. January 1, 1992
Carol Dengis (Steinbach)	3rd year Ph.D.
Jingyu Dong(Howard)	1st year Ph.D.
Karabassis Evangelos(Spetsakis)	Obtained M.Sc. in Spring 1992
Paola Feresin	Ph.D. student from Trieste working with I. Howard
Tim Field (Ostroff)	2nd year M.Sc.
Herb Goltz (Steinbach)	2nd year Ph.D
Carl Gruden(Ostroff)	2nd year M.Sc.
Lorraine Gunther (Ono)	2nd year M.A.
Stan Hamstra (Regan)	3rd year Ph.D.
Suneeti Kaushal (Regan)	2st year M.A.
Renate Korn (Ono)	1st year M.A.
Edith Li (Jenkin)	Obtained M.Sc. in May, 1992
Feng Lu (Milios)	4th Ph.D at U of T.
Bernard Majoris (Jenkin)	2nd year M.Sc.
Cao Lianqun (Kaiser)	2ndyear M.A.
Alistair Mapp (Ono)	NSERC Post-Doc at DCIEM
Ng Siu-Ming(Spetsakis)	3rd year M.Sc.
Ziqiang Wu(Milios)	Obtaining M.Sc. in August 1992
Sun Zuening(Spetsakis)	2nd year M.Sc.
Jay Ying (Milios)	1st year M.Sc.
James Zacher (Howard)	4th year M.A.
Hong Zhao(Milios)	1st year M.Sc.

## **Research Grants (Annual)**

### **Bock**

NSERC Operating Grant. Control principles of aimed arm movements in humans.	\$13,000
NATO Exchange Grant with Cooke and Hefter. Pointing movements of neurological patients.	\$7,000
Canadian Space Agency grant with Howard and Money. Experiments in parabolic flight.	\$2,000
Ontario Work/Study Programme.	\$1,000
DCIEM contract. Purposive arm movements during $G_z$ centrifuge stimulation.	\$33,000
DCIEM Contract with D'Eleuterio. New control concept for robotic manipulators.	\$85,000
Canadian Space Agency Contract with K. Money. Eye-hand coordination in microgravity.	\$55,000

### **Grasse**

NSERC Operating Grant.	\$30,000
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### **Harris**

York University Grant.	\$20,000
NSERC Operating Grant. The detection of conflict in visual-vestibular interactions.	\$30,000
NATO Exchange Grant with Smith. Perceptual systems for motion detection.	\$8,000

### **Howard**

NSERC Operating Grant. Visual pursuit and induced visual motion.	\$43,800
DCIEM Contract. Vection and induced motion.	\$60,000
NSERC Conference Grant with Jenkin and Regan. Spatial Vision in Humans and Robots.	\$10,000
NATO Travel Grant with Rogers. Stereoscopic Vision.	\$8,500
Ontario Centre of Excellence Grant with Regan, Anstis, Ono, Grasse.	
Human Performance in Space Laboratory.	\$535,000

### **Jenkin**

NSERC Operating Grant. Representation and control in dynamic stereopsis.	\$17,000
NSERC Equipment Grant with Amanatides, Milios and Spetsakis. Graphics equipment.	\$16,412
PRECARN ARK Project with Milios.	\$81,042

### **Kaiser**

NSERC Operating Grant. Studies in colour vision.	\$44,800
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### **Milios**

NSERC Operating Grant.	\$17,611
Ontario-Quebec Exchange grant with Jenkin and Dudek. Robot Navigation and Range Sensing.	\$1,950
Ontario-Quebec Exchange grant with Jenkin and Dudek. Sonar based robotic exploration.	\$2,500
Presidents' NSERC Grant with Amanatides and Spetsakis. Sensor based robotics facility.	\$4,000

### **Ohmi**

NSERC Operating Grant. Frames of reference for perceived direction of self motion.	\$15,000
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### **Ono**

NSERC Operating Grant. Sensory and motor aspects of space perception.	\$35,000
NATO Travel Grant with Wade, Swanston. Motion and orientation in spatial vision.	\$8,500

### **Ostroff**

NSERC Operating Grant. Design of real-time discrete event systems.	\$22,442
NSERC Equipment Grant. Workstation Purchase.	\$20,000
NSERC Infrastructure Grant with 7 other investigators.	\$45,000
NSERC Equipment Grant with 7 other investigators. Research Machine Upgrade.	\$76,637

### **Regan**

NSERC Operating Grant.	\$71,000
MRC Operating Grant.	\$61,192
NIH Grant.	\$88,446
U.S. Air Force Grant.	\$229,000

### **Spetsakis**

NSERC Operating Grant. Visual Motion Analysis.	\$18,000
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**Stager**

Transport Canada. Human Engineering in Canadian Automated Air Traffic System \$115,000

**Steinbach**

NSERC Operating title: Human Oculomotor Control. \$38,000

Atkinson College Minor Research Grant: Is gravity involved in an unusual form of strabismus. \$1,600

**Total annual value of grants****\$1,971,432**

## Publications June 1991-June 1992

### Books

- Harris L.R. and Jenkin, M.J. (Eds.). 1992. *Spatial Vision in Humans and Robots*. Cambridge University Press. New York, in press.
- Ono, H., Wagner, M. and Ono, K. S. (Eds). 1990. *Psychophysics II: Precision and Accuracy*. [Educational Computer Package]. Santa Barbara: Intellimation, in press.

### Chapters in Books

- Grasse, K.L. and Cynader, M.S. The accessory optic system of frontal-eyed animals. In A. Leventhal (Ed.), *Vision and Visual Dysfunction*, Vol. IV, Chap. 5, *The Neuronal Basis of Visual Function*. London: Macmillan, in press.
- Grusser O-J., Guldin W., **Harris L.R.**, Lefebvre S.C. and Pause M. Cortical representation of head in space and some psychophysical experiments on head movements. In A. Berthoz, P.P.Vidal and W. Graf (Eds), *The Head-Neck Sensory Motor System*. Oxford University Press, Oxford, 1992, pp 497-509.
- Wall C, **Harris L.R.** and Lathan C. Visuo-vestibular interactions during z-axis linear accelerations in man. In D. L. Tomko, B. Cohen and F. Guedry (Eds.), *Sensing and Controlling Motion: Vestibular and Sensorimotor Function*, 1992, in press.
- Harris L.R. and Jenkin M. *Spatial Vision in Humans and Robots*. In L. R.Harris and M. Jenkin (Eds.), *Spatial Vision in Humans and Robots*. Cambridge University Press, New York, 1992, in press.
- Howard, I.P. The stability of the visual world and the perception of self motion. In J. Wallman and F.A. Miles (Eds.) *Visual Motion and its Role in the Stabilization of Gaze*. Elsevier, in press.
- Howard, I.P. The optokinetic system. In J.A. Sharpe and H.O. Barber (Eds.), *The Vestibulo-ocular Reflex, Nystagmus and Vertigo*. New York: Raven Press, in press.
- Howard, I. P. Cyclovergence, cyclovergence and perceived slant. In L. Harris and M. Jenkin (Eds.), *Spatial Vision in Humans and Robots*. New York: Cambridge University Press, in press.
- Wang, Z. and **Jenkin, M.** Using Complex Gabor Filters To Detect and Localize Edges and Bars. In C. Archibald (Ed.), *Advances in Machine Vision: Strategies and Applications*. Singapore: World Scientific 1992, in press.
- Wilkes, D., Dudek, G., **Jenkin, M.** and Milios, E. Modelling sonar range sensors. In C. Archibald (Ed.), *Advances in Machine Vision: Strategies and Applications*. Singapore:World Scientific Press, 1992, in press.
- Kaiser, P.K. Flicker as a function of wavelength and heterochromatic flicker photometry. In J.J. Kulikowski, V. Walsh and I.J. Murray (Eds.), *Vision and Visual Dysfunction*, Vol 5, *Limits of Vision*, Macmillian, 1991, pp 171-190.
- Milios, E. Shape Matching using Curvature Processes. In H. Nasr (Ed.), *Automatic Object Recognition, SPIE, The International Society for Optical Engineering* (reprinted from *Computer Vision, Graphics, and Image Processing*), 1992.
- Milios, M. and Nawab H. The Signal Abstraction Concept for Signal Interpretation. In A. Oppenheim and H. Nawab (Eds.), *Symbolic and Knowledge-Based Signal Processing*, Prentice Hall, 1992.
- Dorken, E., **Milios, E.** and Nawab, H. Knowledge-Based Signal Processing Applications. In A. Oppenheim and H. Nawab (Eds.), *Symbolic and Knowledge-Based Signal Processing*, Prentice Hall, 1992.
- Ono, H. Binocular visual directions of an object when seen as single or double. In D. Regan (Ed.), *Vision and Visual Dysfunction*, Vol 10, *Binocular Vision*, London: Macmillan, 1991.
- Ostroff, J.S. Verification of Safety Critical Systems Using TTM/RTTL. *Real-Time: Theory in Practice, LNCS 600*, Springer-Verlag, 1992.
- Regan, D. Nonlinearities in psychophysical models of the processing of spatial form and motion. In R. Pinter (Ed.), *Nonlinear Vision*, Boca Raton, 1992, 265-292.

- Regan, D. Detection and discrimination of spatial form in patients with eye or visual pathway disorders. Fifth Annual Retina Research Foundation Symposium. Contrast Sensitivity: From Receptors to Clinic, M.I.T. Press, 1992, in press.
- Regan, D. Detection and discrimination of motion-defined and luminance-defined two-dimensional form. In L. Harris and M. Jenkins (Eds). *Spatial Vision in Humans and Robots*. New York: Cambridge University Press, 1992, in press.
- Regan, M.P. and Regan, D. A frequency domain method for testing nonlinear multi-neuron models against data. In R. Pinter (Ed) *Nonlinear Vision*, Boca Raton, 1992, 265-292.

### Papers in Refereed Journals

- Steinbach, M. J. The need for eye muscle proprioception. In L. Jami, E. Pierrot-Deseilligny and D. Zytznicki (Eds.), *Muscle Afferents and Spinal Control of Movement*. London, Pergamon Press, in press.
- Bock, O. The characteristics of arm movements executed in unusual force environments. *Advances in Space Research*, 1992, 12, 237-241.
- Bock, O., Howard, I.P., Money, K.E. and Arnold, K.E. Human motor performance in changed gravity. *Aviation space and environmental Medicine*, in press.
- Bock, O. Adaptation of aimed arm movements to sensory-motor discordance: Evidence for direction-independent gain control. *Behavioral Brain Research*, in press.
- Bock, O. and Arnold, K.E. Motor control prior to movement onset: Preparatory mechanisms for pointing at visual targets. *Experimental Brain Research*, in press.
- Gonzalez, E.G., Steinbach, M.J., Ono, H. and Rush-Smith, N. Vernier acuity in monocular and binocular children. *Clinical Vision Sciences*, in press.
- Grasse, K.L. and Lisberger, S.L. Analysis of a naturally occurring asymmetry in vertical smooth pursuit in a monkey. *Journal of Neurophysiology*, 1992, 67, 164-179.
- Grasse, K.L., Douglas, R.M. and Mendelson, J.R. 1992. Expansion of visual receptive fields in the superficial layers of the superior colliculus induced by amphetamine. *Experimental Brain Research*, in press.
- Mendelson, J.R. and **Grasse, K.L.** FM sweep selectivity in cat primary auditory cortex; a comparison of monaural and binaural responses in single units. *Experimental Brain Research*, in press.
- Mendelson, J.R., Schreiner, C.E., Sutter, M. and **Grasse, K.L.** 1992. Functional topography of cat primary cortex: II. Responses to frequency modulated sweeps. *Experimental Brain Research*, in press.
- Harris, L.R. and Smith, A.T. Use of plaid patterns to distinguish the corticofugal and direct inputs to the brainstem optokinetic generator. *Experimental Brain Research*, 1991, 86, 324-332.
- Harris, L.R. and Stelling, J.W. The effect of canal/visual and canal/otolith conflict on type I vestibular nucleus neurones. *Acta Otolaryngology*, 1991, 481, 266-268.
- Harris, L.R. and Smith, A.T. Second-order motion stimuli do not evoke optokinetic nystagmus. *Visual Neuroscience*, 1992, in press.
- He, P. and Fowler, E. Saccadic localization of eccentric forms. *Journal of the Optical Society of America A*, 1991, 8, 440-449.
- He, P. and Fowler, E. The role of saccades in the perception of texture patterns. *Vision Research*, 1992, in press.
- Heckmann, T. and **Howard, I.P.** Induced motion: Isolation and dissociation of egocentric and vection-entrained components. *Perception*, 1991, 20, 285-305.
- Howard, I.P. and Zacher, J.E. Human cyclovergence as a function of stimulus frequency and amplitude. *Experimental Brain Research*, 1991, 85, 445-450.
- Cheung, B. and **Howard, I.P.** Motion sickness in labyrinthine defective patients. *Aviation Space and Environmental Medicine*, 1991, 527-531.
- Howard, I.P. and Marton, C. Visual pursuit over textured backgrounds in different depth planes. *Experimental Brain Research*, in press.



- Cheung, B.S.K., Money, K., **Howard, I.P.**, Kirienko, N., Johnson, W., Lackner, J. and Evanoff, J. Human ocular torsion during parabolic flights: An analysis with scleral search coils. *Experimental Brain Research*, in press.
- Wade, N.J., Swanston, M.T., **Howard, I.P.**, Ono, H. and Shen, X. Induced rotary motion and ocular torsion. *Vision Research*, 1991, 31, 1979-1984.
- Dudek, G., **Jenkin, M.**, **Milios, E.** and Wilkes, D. Robotic Exploration as Graph Construction. *IEEE Transactions on Robotics and Automation*, 1991, 7(6), pp. 859-865.
- Jenkin, M., **Milios, E.**, Tsotsos, J. TRISH: A binocular robot head with torsional eye movements, special issue on mobile robots, robot heads and active vision of the *International Journal of Pattern Recognition and Artificial Intelligence*, in press.
- Kaiser, P.K. Minimal distinct border: 1824-1990, A tribute to RMB. *Optical Society of America, Technical Digest*, 1992, 4, 208-210.
- Kaiser, P.K. and Y. Nakano. Color fusion and flicker fusion frequencies using tritanopic pairs. *Vision Research*, in press.
- Kaiser, P.K., Kremers, J. and Lee, B.B. Sensitivity of Macaque Retinal Ganglion cells and human observers to combined luminance and chromatic modulation. *Journal of the Optical Society of America*, in press.
- Kaiser, P.K., Valberg, A., Lee, B.B. and Kremers, J. Responses of macaque ganglion cells to movement of chromatic borders, *Journal of Physiology*, 1992, in press.

#### **Papers in Refereed Journals cont'd**

- Pitas, I. and **Milios, E.** Venetsanopoulos: A Minimum Entropy Rule Learning System from Examples *IEEE Transactions on Systems, Man and Cybernetics*, 1992, 22(3).
- Metaxas, D. and **Milios, E.** Reconstruction of a color image from sparse, noisy, and nonuniform data, *Computer Vision, Graphics, and Image Processing (Graphical Models and Image Processing)*, 54(2), March 1992, pp. 103-111.
- Ono, H., Shimono, K. and Shibuta, K. Occlusion as a depth cue to Wheatstone-Panum's limiting case. *Perception and Psychophysics*, 1992, 51, 3-13.
- Swanston, M.T., Wade, N.J., **Ono, H.** and Shibuta, K. The interaction of perceived distance with the perceived direction of visual motion during movements of the eyes and of the head. *Perception and Psychophysics*, in press.
- Ostroff, J.S. A Real-time Verifier. *Real-Time Systems Journal*, Massachusetts, April 1992.
- Ostroff, J.S. Formal Methods for the Specification and Design of Real-time safety Critical systems. *Journal of Systems and Software*, April 1992.
- Ostroff, J.S. Constraint logic programming for reasoning about discrete event processes. *Journal of Logic Programming*, 1991, 11, 243-270.
- Regan, D. Do letter charts measure contrast sensitivity? *Clinical and Visual Science*, 1991, 6, 401-408.
- Regan, D. A sensitive method for quantifying functional loss caused by veiling glare in patients and elderly nonpatients. *Optical Society of America, Technical Digest*.
- Regan, D. Prentice medal lecture. Specific tests and specific blindness: keys, locks and parallel processing. *Optometry and Visual Science*, 1991, 68, 487-512.
- Regan, D. and Hamstra, S. Shape discrimination for motion-defined and contrast-defined form: Squareness is special. *Perception*, 1991, 20, 315-336.
- Regan, D., Hong, X.H., Kothe, A.C., Giaschi, D., Hamstra, S. Motion-defined letter reading test. *Optical Society of America, Technical Digest*.
- Regan, D., Kothe, A.C. and Sharpe, J.A. Recognition of motion-defined shapes in patients with multiple sclerosis and optic neuritis. *Brain*, 1991, 114, 1129-1155.
- Giaschi, D., **Regan, D.**, Kothe A.C., Sharpe J.A. and Hong X.H. 1992. Multiple Sclerosis can degrade the recognition of motion-defined letters while sparing sensitivity to motion. *Annals of Neurology*, 1992, 31, 621-628.
- Regan, D. Visual judgements and misjudgements in cricket, and the art of flight. *Perception*, 21, 91-115.

- Regan, D. Spatial vision in children and adults: A tribute to Russel Harter. *International Journal of Neuroscience*, in press.
- Regan, D., Giaschi, D., Kraft, S. and Kothe, A.C. A functional subclassification of amblyopia and suggested implications for patient management. *Ophthalmic and Physiological Optics*, in press.
- Giaschi, D., **Regan, D.**, Kraft, S. and Hong, X.H. Defective processing of motion in the fellow eye of unilateral amblyopes. *Investigative Ophthalmology and Visual Science*, in press.
- Regan, D. and Hamstra S. Dissociation of discrimination thresholds for time to contact and for rate of change of size. *Vision Research*, in press.
- Regan, D. Giaschi, D., Sharpe, J.A. and Hong, X.H. Visual processing of motion-defined form: selective failure in patients with parieto-temporal lesions. *Journal of Neuroscience*, 12, 2198-2210.
- Regan, D. and Lee, B.B. A comparison of the human 40 Hz response with the properties of macaque ganglion cells. *Visual Neuroscience*, in press.
- Regan, D. and Hamstra, S. Shape discrimination and perfect symmetry. *Vision Research*, in press.
- Regan, D. and Hamstra, S. The effects of presentation duration and dot lifetime on orientation discrimination for motion-defined bars and contrast-defined bars. *Vision Research*, in press.
- Steinbach, M.J., Ono, H. and Wolf, M. Motion parallax judgements of depth as a function of the direction and type of head movement. *Canadian Journal of Psychology*, 1991, 45, 92-98.
- Reed, M.J., **Steinbach, M.J.**, Anstis, S.M., Gallie, B.L., Smith, D.R. and Kraft, S.P. The development of optokinetic nystagmus in strabismic and monocularly enucleated subjects. *Behavioural Brain Research*, 1991, 46, 31-42.
- Telford, L., Howard, I.P. and Ohmi, M. The effects of discordant visual-motor or visual-vestibular information on judgements of heading. *Perception*, in press.

## Published Proceedings

- Li, Yizhi E. and **Jenkin, M.R.M.** *Shape from rotation using stereo VI 92*. Vancouver, B.C., 1992, 119-124.
- Jenkin, M., Milios, E. and Tsotsos, J. TRISH: The Toronto-IRIS Stereo Head. *SPIE Applications of AI X, Machine Vision and Robotics Conference*, Orlando, Florida, 1992, 36-46.
- Jenkin, M.R.M. Using stereomotion to track binocular targets. *CVPR 91*, Maui, Hawaii, 1991, 96-102.
- Wang, Z. and **Jenkin, M.R.M.** Detection and localization of bar-like targets using gabor filters. *Vision Interface 91*, Calgary, Alberta, 1991, 97-103.
- Wilkes, D., Dudek, G., **Jenkin, M.** and Milios, E. The simulation of sonar mapping in complex environments using multiple reflecting surface. *Vision Interface 91*, Calgary, Alberta, 213-217, 1991.
- Cooperstock, J. and **Milios, E.** Adaptive Neural Networks for Vision-Guided Position Control of a Robot Arm. *IEEE International Symposium on Intelligent Control*, Glasgow, Scotland, August, 1992.
- Cooperstock, J. and Milios, E. Neural network control for a vision-guided mobile robot arm. *IASTED International Conference on Control and Robotics*, Vancouver, August, 1992.
- Milios, E. and Horton, T.A. Combined Extended Circular Image and Spatial Occupancy approach to 2-D Contour Matching. *1992 IEEE/RSJ International Conference on Intelligent Robots and Systems*, (IROS).
- Matthews, M. L., **Stager, P.** and Graham, M. 1992. Visual performance issues in the development of a large screen display for an air traffic control (ATC) environment. *Proceedings of the National Computer Graphics Association 13th Annual Conference and Exposition: CAD & Engineering Workstations '92*. March 9, Anaheim, California.
- Karnavas, W.J., Bahill, A.T. and **Regan, D.** 1991. Sensitivity analysis of a model for the rising fastball and breaking curveball. *Proceedings of the IEEE Systems Man and Cybernetics*, Los Angeles, in press.

- Regan, D. Procedures for establishing low-contrast vision and glare susceptibility standards for pilots and drivers, and the selection of personnel for visual search and surveillance. In *Proceedings of the Symposium on Aeromedical Aspects of Vision*, Toronto, 34-56.
- Regan, D., Hong, X.H. and Hamstra, S. 1991. Visual sensitivity to camouflaged motion-defined objects and the limits of safety in nap-of-the-Earth helicopter navigation. In *Proceedings of the Symposium on Aeromedical Aspects of Vision*, Toronto, 161-166.

### Technical Reports

- Howard, I. P. Vection and induced visual motion. Final Report for Contract W7711-9-7071/01-XSE, *Defense and Civil Institute of Environmental Medicine*, January, 1992.
- Stager, P. Feasibility study for the development of a common vessel traffic services workstation. (Transport Canada Contract T8200-9-0538/01-XSD). Final report prepared for the *Transportation Development Centre and the Canadian Coast Guard Vessel Traffic Services*, August, 1991.

### Conference Presentations and Abstracts

- Arnold, K. and Bock, O. Motor preparation mechanisms in pointing movements. *Abstr. Third IBRO world congress of Neurosci.*, Montreal, CDN 1991.
- Bock, O., Weiss, P. and Hefter, H. Kinematics of aimed arm movements in cerebellar patients. *2nd Int. Congress of Movement Disorders*, München, D 1992.
- Bock, O., Howard, I., Money, K. and Arnold, K. Aimed arm movements under changed gravity. *Abstr. Spacebound '91*, Ottawa, CDN 1991.
- Bock, O. and Laimer, E. Role of peripheral retina in visuomotor coordination. *Abstr. Third IBRO world Congress of Neuroscience*, Montreal, CDN 1991.
- Bock, O. Motor control prior to movement onset: preparatory mechanisms for movement execution. *Greater Southern Ontario Psychomotor Meeting*, Hamilton, CDN 1991.
- Bock, O. and Arnold, K. The evaluation of spatial cues by the motor control system. *Conference on Spatial Vision in Humans and Robots*, Toronto, CDN 1991.
- Bock, O. Research on human physiology in space within the future space science program. Invited presentation, *Regional Conference on the Long-Term Space Program*, Toronto, CDN 1991.
- Dengis, C., Steinbach, M.J. and Kraft, S. Monocular occlusion for one month: lack of effect on a variety of visual functions in normal adults. *Investigative Ophthalmology and Visual Science*, 1992.
- Goltz, H., Harris, L. and Steinbach, M. J. Gravity as a passive force on the cat's eye: implications for oculomotor control. *Investigative Ophthalmology and Visual Science*, 1992, 33, 2292.

### Conference Presentations and Abstracts cont'd.

- Grasse, K.L. The effects of positional disparity on motion selective responses in the cat accessory optic system. *Society for Neuroscience Abstracts*, 1991, 17, 1380.
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- Regan, D., Kraft, S.P. and Giaschi, D. A functional subclassification of amblyopia and implications for patient management. *Annual Research Day*, Department of Ophthalmology, April, 1992.
- Francis, C., Rootman, D.S. and **Regan, D.** Contrast acuity testing in aphakic patients with epikeratophakia or contact lens. *Annual Research Day*, Department of Ophthalmology, April, 1992.
- Regan, D. Detection and discrimination of spatial form in patients with eye or visual pathway disorders. *Fifth Annual Retina Research Symposium*, Houston, March, 1992.
- Regan, D. The use of MEG and EEG in studying parallel processing in human vision. *Closed Workshop on Functional Imaging Convened by U.S. Grant Giving Bodies*, Virginia, May, 1992.
- Giaschi D., **Regan D.**, Sharpe, J., Hong X.H. and Bernstein, M. Visual processing of motion-defined form: selective failure in patients with parieto-temporal lesions. *Investigative Ophthalmology and Visual Science*, 1992, 33, 1130.
- Regan, D. and Hamstra S. Dissociation of discrimination thresholds for time to contact and for rate of angular expansion. *Investigative Ophthalmology and Visual Science*, 1992, 33, 1138.
- Steinbach, M.J. The need for eye muscle proprioception. Invited presentation at the symposium honouring Y. Laporte: *Muscle Afferents and the Spinal Control of Movement*, Paris, 1991.
- Steinbach, M.J. How a good outflow boy went wrong. Invited presentation at the symposium honouring M.I.T. Professor Richard Held, *Eastern Psychological Association Meeting*, Boston, 1992.
- Steinbach, M.J., Dengis, C. and Kraft, S. Botulinum toxin induces equal shifts of eye alignment in lateral and medial rectus muscles. *Investigative Ophthalmology and Visual Science*, 1992. [Also presented at the *Annual Research Day*, Department of Ophthalmology, University of Toronto, April, 1992.
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## Colloquia

### **Otmar Bock**

Nasa Ames Research Center, Moffett Field, 1992

Department of Computer Science, York, University, 1992

**Laurence Harris**

University of Waterloo, September, 1991

University of Toronto, September, 1991

**Ian Howard**

Brooks Air Force Base, San Antonio, Texas, February, 1992

University of Toronto, March 1992

**Michael Jenkin**

Department of Mathematics, York University, February, 1992

Department of Computer Science, Trent University, November, 1991

Queen's University, Kingston, May, 1992

**Evangelos Milios**

Technical University of Crete, Hania, Greece, May 7, 1992

Ulm, Germany, May 19, 1992

Erlangen-Tennelohe, Germany, May 21, 1992

**Hiroshi Ono**

University of Chita, February, 1992

Department of Visual Perception, ATR (Advance Telecommunication Research), February, 1992

NTT(Nippon Telephone & Telegram)

School of Psychology, Otago University, March-April, 1992

University of Auckland, April, 1992

York University, June, 1992

University of Houston, August, 1992

**David Regan**

Aston University, U. K., September 12, 1991

University of Rochester, November 19, 1992

University of Houston, January 22, 1992

University of Toronto, February 28, 1992

York University, March 12, 1992

University of Montreal, March 18, 1992

University of Maryland, June 15, 1992

**Spetsakis**

Queen's University, February 19, 1992

**Martin Steinbach**

University of Toronto - Psychology Vision Group, October, 1991

**Patents**

Jenkin, M. and J. Tsotsos. An informal British patent application for a "Large-scale, touch sensitive video display" (British Patent No. 9201949.6) has been filed by the firm of Sim & McBurney.

## Awards

- Otmar Bock** Member, Canadian Aeronautics and Space Institute.
- Evangelos Milios** Member of the ACM Doctoral Dissertation Award Committee, 1990, 1991.  
Member of the Program Committee, Vision Interface 1991.  
Member of the visiting committee of the NSERC Information Systems and Manufacturing Systems Selection Panel, July 10, 1991.
- Peter Kaiser** Awarded the Faculty of Arts Leave Fellowship
- Hiroshi Ono** William Evans Visiting Fellowship, University of Otago, Dunedin, New Zealand, 1992
- David Regan** Appointed Distinguished Research Professor, York University, 1991  
Killam Fellow, 1992  
Editorial Board, Vision Research, 1992
- Paul Stager** Co-Director, NATO Advanced Study Institute on Validation and Verification of Complex and Integrated Human-Machine Systems. Vimeiro, Portugal, July 6-17, 1992.
- Martin Steinbach** 1991: Member, NSERC, Scholarships and Fellowships Grant Committee  
Editorial Board, Binocular Vision

## Conferences

We plan to hold an international conference on Stereopsis and Optic Flow at York University in conjunction with the ESPRIT group of visual scientists from Europe. June 24 to 27th 1993.

## Seminars given by visiting scientists

- |                 |               |   |
|-----------------|---------------|---|
| M. Banks        | Berkeley      | Optical and Photoreceptor Immaturities Limit Vision in Human Infants                              |
| R. Blake        | Berkeley      | Stereopsis and Kinetic Depth: Two Sides of the Same Coin?   |
| J. Finlay       | Durham        | Human Saccadic Eye Movements: Problems and Puzzles  |
| W. Gogel        | Santa Barbara | The Role of Perceived Distance in Compensation for Head Motion                                    |
| W. Graf         | Rockefeller   | Comparative Anatomy and Physiology of Head-Movement Control                                       |
| C. Ingling      | Ohio          | Assigning Percepts to the Parvo Magno Channels of the Visual System                               |
| S. Lisberger    | San Francisco | The Neurophysiology of Motor Learning the Vestibulo-ocular Reflex                                 |
| H. Mittelstaedt | Max Planck    | The Perception of the Vertical  |
| M. Merzenich    | San Francisco | The Role of Dynamic Neocortical Processes in Higher Brain Function                                |
| J. Mollon       | Cambridge     | Ancient and Modern Subsystems of Vision   |
| R. O'Shea       | Otago         | Interocular Transfer of the Movement Aftereffect  |
| D. Regan        | York          | Visual Processing of Motion and Form in Normally-sighted Individuals and in Neurological Patients |
| B. Rogers       | Oxford        | Vertical Disparity: Differential Perceptive and Binocular Stereopsis                              |
| A. Smith        | Cardiff       | Detecting the Speed of Image Motion   |
| L. Telford      | York          | The Perception of Self-Motion and Heading   |
| J. Victor       | Cornell       | Receptive Field Structure of X and Y Ganglion Cells in Cat Retina                                 |

