

MICHAEL LANGER

Phone: (514) 398-3740
michael.langer@mcgill.ca
www.cim.mcgill.ca/~langer

School of Computer Science Rm. 318
McConnell Engineering Building
3480 University St
Montreal QC
H3A2K6 Canada

EDUCATION

- | | | |
|------------|--|------|
| PhD | McGill University, Dept. Electrical Engineering
Dissertation: "Shading computations on the radiation manifold"
Supervisor: S.W. Zucker | 1994 |
| MSc | University of Toronto, Dept. Computer Science
Thesis: "On Efficient Representations of Natural Images"
Advisor: A.D. Jepson | 1988 |
| BSc | McGill University
Graduated with Great Distinction
Major in Mathematics, Minor in Computer Science | 1986 |

EMPLOYMENT

- | | |
|--|------------|
| Associate Professor
School of Computer Science, McGill University | 2006- |
| Assistant Professor
School of Computer Science, McGill University | 2000-2006 |
| Research Scientist
Max-Planck-Institute for Biological Cybernetics, Tübingen, Germany | 1999-2000 |
| Postdoctoral Scientist
NEC Research Institute, Princeton, NJ, USA | 1995-1998 |
| Research Associate
Center for Intelligent Machines, McGill University | 1991-1994 |
| Summer Research Intern
Brain Imaging Center, Montreal Neurological Institute | 1989 |
| Summer Research Intern
Playfair Institute of Neuroscience, Toronto, Canada | 1985, 1986 |

HONORS AND AWARDS

CIPPRS Lifetime Achievement Award for Service (Canadian Image Processing and Pattern Recognition Society)	2018
CIPPRS Lifetime Achievement Award for Research	2017
Best Vision Paper Award, 4th Canadian Conference on Computer and Robotic Vision	2007
Best Paper Award, 1st Canadian Conference on Computer and Robotic Vision	2004
Siemens Outstanding Paper Award, IEEE Conf. on Comp. Vision & Pattern Recognition	1997
University Scholar, McGill University	1986
McConnell Award, Faculty Scholar (Faculty of Science), McGill University	1985

RESEARCH FELLOWSHIPS

Max-Planck Society Research Stipend	2000
Alexander von Humboldt Research Fellowship	1999
DAAD (<i>Deutscher Akademischer Austauschdienst</i>) Grant for Recent Ph.D.s	1996
NSERC Postgraduate Scholarship (PGS2)	1989-1991
NSERC Postgraduate Scholarship (PGS1)	1986-1988

RESEARCH FUNDING

Individual Research Grants

MITACS	Accelerate	\$95,000	Gated and RGB Fusion for Robust Perception (with Fahim Mannan, Yiran Mao, Amanpreet Walia, Abe Yesgat (Algolux))	2019-2020
MITACS	Accelerate	\$15,000	Learning Depth from Transmissive Diffraction Mask based Sensor (with student Neeth Kunnath at Tandemlaunch (Airy3D))	

MITACS	Accelerate	\$15,000	Refocusing and All-In-Focus images for Angle-Sensitive Pixels (with student Neeth Kunnath at Tandemlaunch (Airy3D))	2016
NSERC	Discovery	\$130,000 (\$26,000 / year)	“Computational perception of surface material and 3D spatial layout”	2016-2021
NSERC	Discovery (Operating)	\$100,000 (\$20,000 / year)	“Human Assisted Computer Vision”	2011-2016
MITACS	Accelerate	\$15,000	“Interactive image segmentation with the diyorama mobile engine ” (with student Fahim Mannan at Hololabs Studio Inc.)	2013
NSERC	Discovery (Operating)	\$115,000 (\$23,000 / year)	“Appearance Models for Computer Vision”	2006-2011
NSERC	Discovery (Operating)	\$115,000 (\$23,000 / year)	“Appearance Models for Computer Vision”	2001-2006
McGill U.	Start up	\$50,000	“Appearance Models for Computer Vision”	2000

Team Research Grants

FQRNT	Programme Projet de Recherche en Équipe (Operating)	\$126,000	“Rendu de volume base sur la perception” with C.L. Baker and F. Kingdom at McGill	2010-2013
FQRNT	Programme Projet de Recherche en Équipe (Equipment)	\$10,000	(same as above)	2010-2011
FQRNT	Programme Projet de Recherche en Équipe (Operating)	\$120,000 (\$40,000/yr)	“Reconstruction multi-échelle de scènes tridimensionnelle complexes” (w/ S. Roy at U. de Montréal)	2005-2008
CFI	New Opportunities (Equipment)	\$352,000	“Computer Vision, Medical Imaging, and Perceptual Modelling” (w/ T. Arbel of McGill U.)	2002-2005
FCAR	Programme Établissement de Nouveaux Chercheurs, Volet Équipe (Operating)	\$90,000 (\$30,000/yr) Operating	“Visual reconstruction of complex scenes” (w/ S. Roy at U. de Montréal)	2001-2004

*I was Principal Investigator on the FCAR and FQRNT grants and co-PI on the CFI. My share of all four of these grants was 50%.

PUBLICATIONS

JOURNAL (refereed)

Perception of a black room seen through a veiling luminance. A. Gilchrist & M. S. Langer. *i-Perception*, 11(6), 1–9. (2020).

Density discrimination with occlusions in 3D clutter M. Scaccia, M.S. Langer *Journal of Vision* Oct. 2019, 19 (10)

A Psychophysical Evaluation of Texture Compression Masking Effects G. Lavoue, M.S. Langer, A. Peytavie, P. Poulin, *IEEE Transactions on Visualization and Computer Graphics* Feb. 2018

Signs of depth-luminance covariance in 3D cluttered scenes M. Scaccia, M.S. Langer *Journal of Vision* March 18 (5) 2018

Defocus Discrimination in Video: Motion in Depth V. A. Petrella, S. Labute, M.S. Langer, P. G. Kry, *i-Perception*, Nov. 2017

Depth discrimination from occlusions in 3D clutter M.S. Langer, H. Zheng, S. Rezvankhah *Journal of Vision* 16: 11, Sept. 2016

Are blur and disparity complementary cues to depth? M. S. Langer, R. A. Siciliano, *Vision Research* 107, pp. 15-21, 2015

Qualitative shape from shading, highlights, and mirror reflections A. Faisman, M. S. Langer *Journal of Vision* 13(5), 2013

Visibility in three-dimensional cluttered scenes M. S. Langer, F. Mannan *Journal of the Optical Society of America* 29:9, pp. 1794--1807, 2012

Perception of blending in stereo motion panoramas V. Couture, M.S. Langer, S. Roy, *ACM Transactions on Applied Perception* 9:3, July 2012

Removal of Partial Occlusion from Single Images, S. McCloskey, M.S. Langer, K. Siddiqi, *IEEE Trans. Pattern Analysis and Machine Intelligence* 33(3), pp. 647—654, 2011.

Analysis of Disparity Distortions in Omnistereoscopic Displays V. Couture, M.S. Langer, S. Roy, *ACM Transactions on Applied Perception* vol. 7 no. 4, 2010.

Learning illumination- and orientation-invariant representations of objects through temporal association, G. Wallis, B.T. Backus, M. S. Langer, G. Huebner, H.H. Buelthoff, *Journal of Vision* 9 (7) pp. 1-8, 2009

Perceptual limits on 2D motion field visualization, M. S. Langer, J. Pereira, D. Rekhi, *ACM Transactions on Applied Perception*, 3(3) pp. 179—193, 2006

Spectral estimation of motion parallax and application to egomotion, R. Mann and M.S. Langer, *Journal of the Optical Society of America A*. 22(9) 1717-1731, 2005

Optical Snow, M.S. Langer and R. Mann, *International Journal of Computer Vision* 55(1): 55-71, 2003.

A prior for global convexity in local shape from shading, M.S. Langer and H. H. Buelthoff, *Perception*. 30 (4):403-410, 2001.

Depth discrimination from shading under diffuse lighting, M.S. Langer and H. H. Buelthoff, *Perception*. 29 (6) 649-660, 2000.

Large scale failures of f^{α} scaling in natural image spectra, M.S. Langer, *Journal of the Optical Society of America A*. 17(1):28-33, 2000.

When shadows become interreflections, M.S. Langer, *International Journal of Computer Vision*. 34 (2/3):193-204, 1999.

Towards Accurate Recovery of Shape from Shading under Diffuse Lighting, A.J. Stewart, M.S. Langer, *IEEE Transactions on Pattern Analysis and Machine Intelligence*. 19(9):1020-1025, 1997.

Casting light on illumination: a computational model and dimensional analysis of sources, M.S. Langer, S.W. Zucker, *Computer Vision and Image Understanding*. 65: (2):322-335, 1997.

Shape from Shading on a Cloudy Day, M.S. Langer, S. W. Zucker, *Journal of Optical Society of America*. 11: 467-478, 1994.

CONFERENCE (refereed)

Depth from Defocus on a Transmissive Diffraction Mask-based Sensor N. Kunnath, J. Cho, M.S. Langer *17th Conference on Computer and Robot Vision* May 2020

Discriminative filters for depth from defocus F. Mannan and M.S. Langer, *International Conference on 3D Vision* , Stanford CA, Oct 2016

What is a good model for depth from defocus? F. Mannan and M.S. Langer, *13th Conference on Computer and Robot Vision* , Victoria, Canada, June 2016

Blur calibration for depth from defocus F. Mannan and M.S. Langer, *13th Conference on Computer and Robot Vision* , Victoria, Canada, June 2016

Optimal camera parameters for depth from defocus F. Mannan and M.S. Langer, *International Conference on 3D Vision (3DV)* , Lyon France, pp. 326-334, Oct. 2015

How does lighting direction affect shape perception of glossy and matte surfaces? A. Faisman, M. S. Langer *Proceedings of the ACM Symposium on Applied Perception*, Dublin, U.K. Aug. 2013

Omnistereo video textures without ghosting , V. Couture, M.S. Langer, S. Roy, *3DV: Third Joint 3DIM/3DPVT Conference* Seattle, WA June 2013

Panoramic stereo video textures, V. Couture, M.S. Langer, S. Roy *IEEE International Conference on Computer Vision (ICCV)* Barcelona, Spain. Nov. 2011

Performance of Stereo Methods in Cluttered Scenes, F. Mannan, M. S. Langer, *Eighth Canadian Conference on Computer and Robot Vision*, May 2011

Capturing Non-Periodic Omnistereo Motions V. Couture, M.S. Langer, S. Roy *10th Workshop on Omnidirectional Vision, Camera Networks and Non-classical Cameras (OMNIVIS)*, June 2010, Zaragoza, Spain

Removing Partial Occlusion From Blurred Thin Occluders S. McCloskey, M.S. Langer, K. Siddiqi, *20th International Conference on Pattern Recognition (ICPR)* pp. 4400-4403, Aug. 2010. Istanbul, Turkey

Planar Orientation from Blur Gradients in a Single Image S. McCloskey and M.S. Langer, *Proc. IEEE Conference on Computer Vision and Pattern Recognition*, pp. 2318-2325, Miami June 2009

Surface visibility probabilities in 3D cluttered scenes, M.S. Langer, *10th European Conference on Computer Vision*, Marseilles FR, Oct. 2008

A cue to shading: elongations near intensity maxima D. Gipsman, M.S. Langer, *Fifth Canadian Conference on Computer and Robot Vision*, May 2008

Evolving Measurement Regions for Depth from Defocus. S. McCloskey, M.S. Langer, K. Siddiqi, *8th Asian Conference on Computer Vision* Vol. 2, pp. 858--868, Tokyo, Japan Nov 2007.

Automatic Removal of Partial Occlusion Blur S. McCloskey, M.S. Langer, K. Siddiqi, *8th Asian Conference on Computer Vision* Vol. 1, pp. 271--282, Tokyo, Japan Nov 2007.

Two-frame frequency-based estimation of local motion parallax direction in 3D cluttered scenes V. Couture, M.S. Langer, A. Caine, R. Mann *6th International Conference on 3-D Digital Imaging and Modeling*, pp. 357-364 Montreal, CA Aug. 2007

Can Lucas-Kanade be used to estimate motion parallax in 3D cluttered scenes? V. Couture, M.S. Langer, *4th Canadian Conference on Computer and Robot Vision* pp. 63-70, Montreal, CA May. 2007 [BEST VISION PAPER AWARD]

Motion of specularities on low-relief surfaces: frequency domain analysis Y. Farasat, M.S. Langer, *Human Vision and Electronic Imaging XII (IS&T/SPIE Symposium on Electronic Imaging)* pp. 6492-1A, San Jose, CA Feb. 2007

Spatiotemporal power spectra of motion parallax: the case of cluttered 3D scenes D. Rivait, M.S. Langer, *Human Vision and Electronic Imaging XII (IS&T/SPIE Symposium on Electronic Imaging)* pp. 6492-08, San Jose, CA Feb. 2007

Seeing around occluding objects, S. McCloskey, M.S. Langer, K. Siddiqi, *International Conference on Pattern Recognition (ICPR)*, pp. 963--966, Hong Kong Aug. 2006

The reverse projection correlation principle for depth from defocus, S. McCloskey, M.S. Langer, K. Siddiqi, *Third International Symposium on 3D Data Processing, Visualization and Transmission (3DPVT)* Chapel Hill, USA June, 2006

Motion parallax without motion compensation in 3D cluttered scenes, M.S. Langer, V. Chapdelaine-Couture, R. Mann, S. Roy, *Third International Symposium on 3D Data Processing, Visualization and Transmission (3DPVT)* Chapel Hill, USA June, 2006

Layered motion field visualization: perceptual issues, M. S. Langer, D. Rekhi, J. Pereira, A. Bhatia, *Second Symposium on Applied Perception in Graphics and Visualization (APGV 05)* pp. 37-42, 2005.

Principal components analysis of optical snow, V. Chapdelaine-Couture, S. Roy, M. S. Langer, R. Mann. *British Machine Vision Conference (BMVC 2004)*, London U.K. pp. 799-808. 2004.

A spectral-particle hybrid method for rendering falling snow, M. S. Langer, L. Zhang, A.W. Klein, A. Bhatia, J. Pereira, D. Rekhi. *Rendering Techniques 2004 Eurographics Symposium on Rendering*. A. Keller, H. W. Jensen (eds.) pp. 217-226. Norrkoping, Sweden. 2004 (

Estimating camera motion through a 3D cluttered scene, R. Mann and M. S. Langer. *1st Canadian Conf. on Computer and Robot Vision. (CRV'04)*. London, Canada. pp. 472-479 2004) [BEST PAPER AWARD]

Tracking through optical snow, M. S. Langer and R. Mann, *Lecture Notes in Computer Science 2525: Biologically Motivated Computer Vision*, 2nd International Workshop, H. H. Buelthoff, S.W. Lee, T.A. Poggio, C. Wallraven (Eds.), pp. 181-188, Springer, Nov. 2002.

Optical snow and the aperture problem, R. Mann and M. S. Langer, *International Conference on Pattern Recognition*, Vol. IV, pp. 264-267, Quebec City, Canada. 2002. _

A model of how interreflections can affect color appearance, M.S. Langer, *Colour Research and Application 26(S1)* 218-221 (2001). (Special Issue: The Proceedings of the International Colour Vision Society. Edited by C. R. Cavonius, K. Knoblauch, B. B. Lee, J. Pokorny.)

Human perception of local shape from shading under variable lighting, M.S. Langer and H. H. Buelthoff, *Workshop on Identifying Objects Across Variations in Lighting: Psychophysics & Computation*, Kauai, Hawaii, USA. 2001. _

Dimensional analysis of image motion, M.S. Langer and R. Mann, *IEEE International Conference on Computer Vision*. Vol. 1 pp.155-162, Vancouver, Canada (2001).

What is a Light Source?, M.S. Langer and S.W. Zucker, *IEEE Conf. on Computer Vision and Pattern Recognition*. pp. 172-178, San Juan, PR (1997). [BEST PAPER AWARD]

Towards Accurate Recovery of Shape from Shading Under Diffuse Lighting, A.J. Stewart and M.S. Langer, *IEEE Conf. on Computer Vision and Pattern Recognition*. pp. 411-418. San Fran., CA. (1996). ()

Space Occupancy Using Multiple Shadow Images, M.S. Langer, G. Dudek and S.W. Zucker, *International Conf. on Intelligent Robotics and Systems*. pp. 390-396, Pittsburg PA. (1995).

A ray-based computational model of light sources and illumination, M.S. Langer and S.W. Zucker, *IEEE Workshop on Physics-based Modelling in Comp. Vis.* pp. 93-99, Cambridge, MA. (1995).

Massively Parallel Radiosity in the Presence of Multiple Isotropic Volume Scattering, M.S. Langer, P. Breton and S.W. Zucker, *Graphics Interface*. pp. 103-108, Quebec, Canada. (1995).

Converging and Diverging Light Sources: A Computational Model of Spatially Varying Illumination., M.S. Langer and S.W. Zucker, *Third European Conf. on Computer Vision*. pp. 227-232, Stockholm, Sweden (1994).

Diffuse Shading, Visibility Fields, and the Geometry of Ambient Light, M.S. Langer and S.W. Zucker, *Fourth IEEE International Conf. on Computer Vision*. pp. 138-147, Berlin, Germany. (1993).

Qualitative Shape from Active Shading, M.S. Langer and S.W. Zucker, *IEEE Conf. on Computer Vision and Pattern Recognition*. pp. 713-715, Urbana-Champagne, IL. (1992).

Shading Flow Fields and Scenel Bundles : An Overview, P. Breton, L.A. Iverson, M.S. Langer and S.W. Zucker, *Second European Conf. on Computer Vision*. pp. 135-150, Santa Margherita Ligure, Italy, Springer-Verlag, New York. (1992).

BOOK CHAPTERS AND INVITED PAPERS

Interreflections. M.S. Langer *Computer Vision* . Springer, Cham. Ikeuchi K. (eds) (2021)

Interreflections. M. S. Langer, *Computer Vision, A Reference Guide* K. Ikeuchi ed., Springer 2014: 423-424

Performance of MRF-based Stereo Algorithms for 3D cluttered scenes, F. Mannan and M.S. M.S. Langer, in *Brain, Body, and Machines: Advances in Intelligent and Soft Computing* 2010, Vol. 83/2010, pp. 125-136

On the computation of image motion and heading in a 3-D cluttered scene, M. S. Langer and R. Mann, in *Optical Flow and Beyond*, L. Vaina, S. Beardsely, S. Rushton (Ed.), Kluwer Academic Press, (2004) ()

Measuring Visual Shape using Computer Graphics Psychophysics, M.S. Langer and H.H. Buelthoff, *Eurographics Workshop on Rendering*, (Eds.) B. Péroche, H. Rushmeier. pp. 1-9, Springer, Wien. 2000. ()

Local Qualitative Shape from Active Shading, M.S. Langer and S.W. Zucker, in *Exploratory Vision: The active eye*. M. Landy, M. Pavel and L. Malony (ed.) pp. 191-201. Springer Verlag, New York. (1995).

Shading Flow Fields and Scenel Bundles: A New Approach to Shape From Shading, P. Breton, L.A. Iverson, M.S. Langer and S.W. Zucker, in *Neural Networks for Vision and Image Processing*. G. Carpenter and S. Grossberg (eds.), pp. 111-132. MIT Press, Cambridge, MA. (1992).

CONFERENCE ABSTRACTS

“Density discrimination in 3D clutter: Are we up-front about it?” M, Scaccia, M.S. Langer
European Conference on Visual Perception Trieste, Italy, Aug. 2018

“Microparallax is preferred over blur as a cue to depth order at occlusion boundaries”
D. Tiron; M.S. Langer, *Vision Sciences Society Annual Meeting*, St. Petes Beach FL, May 2018

“The luminance-depth gradient in 3D clutter: when does dark mean deep ?” M. S. Langer, M. Scaccia, *European Conference on Visual Perception (ECPV)*, Berlin, Germany, Aug (2017).

“Depth discrimination from occlusions in 3D clutter scenes” M. S. Langer, H. Zhang, S. Rezvankhah. *Vision Sciences Society Annual Meeting (VSS)*, St. Petes Beach, FL, May (2016).

“Are blur and disparity complementary cues to depth?”, M. S. Langer, R. Siciliano
Vision Sciences Society Annual Meeting (VSS), St. Petes Beach, FL, May (2014).

“Environment maps and the perception of shape from mirror reflections”, M.S. Langer, A. Faisman, *ACM Symposium on Applied Perception (SAP)*, Dublin UK. Aug (2013)

“Environment maps and the perception of shape from mirror reflections” M.S. Langer, A. Faisman, *European Conference on Visual Perception (ECPV)*, Bremen, Germany. Aug (2013)

“Qualitative shape from diffuse and specular reflections” M.S. Langer, A. Faisman
ACM Symposium on Applied Perception (SAP), Los Angeles CA, Aug (2012)

“Qualitative shape from shading, specular highlights, and mirror reflections”, M.S. Langer, A. Faisman, *Vision Sciences Society Annual Meeting (VSS)*, Naples FL, May (2012).

“Probabilities of binocular half-occlusions in 3-D cluttered scenes”, M.S. Langer
European Conference on Visual Perception Utrecht, Aug. 2008

“Motion parallax and specularities”, M.S. Langer and Y. Farasat, *European Conf. on Visual Perception (ECPV)*, La Coruna, Spain, (2005)

“Elongations at intensity maxima: a cue to shading?” M.S. Langer and D. Gipsman
Vision Sciences Society Annual Meeting (VSS) , Sarasota USA (2005)

“Computation of heading from motion parallax in 3-D cluttered scenes” M.S. Langer and R. Mann *Vision Sciences Society Annual Meeting (VSS)*, Sarasota USA (2004)

“Rendering Falling Snow using an Inverse Fourier Transform,” L. Zhang and M. S. Langer, *SIGGRAPH 2003 Sketches & Applications (extended abstract- Full Conference DVD)*

“How to make a motion parallax stimulus using an inverse Fourier transform,” L. Zhang, M.S. Langer, *European Conf. on Visual Perception*, Paris, France, Sept. 2003

“Optical snow and the aperture problem” M.S. Langer, R. Mann, *European Conf. on Visual Perception (ECPV)*, Glasgow, U.K. (2002)

“Motion transparency: optical flow vs. optical snow”, M.S. Langer, R. Mann *European Conf. on Visual Perception (ECPV)*, Kusadasi, Turkey (2001)

“A prior for global convexity in local shape from shading” M. S. Langer, H. H. Bülthoff *European Conf. on Visual Perception (ECPV)*. Groningen, The Netherlands (2000)

“Color perception in a 3-D scene of one reflectance” M. S. Langer, A. Gilchrist *ARVO Annual Meeting*. Ft. Lauderdale, USA (2000)

“Shape from shading perception under diffuse lighting: does dark mean deep?” M.S. Langer, H.H. Bülthoff, *European Conf. on Visual Perception (ECPV)*. Oxford, U.K. (1998)

“Qualitative Shape from Shading: Cloudy Days and Sunny Days”, M.S. Langer, H.H. Bülthoff *ARVO Annual Meeting*. Fort Lauderdale, USA. (1997)

“Reaction Time Processing for Multijoint Upper Limb Movement” M.M. Thompson, .G.Tatton, M.C. Verrier and M.S. Langer *Society for Neuroscience Annual Meeting*. Washington USA. (1986)

PRESENTATIONS AND INVITED LECTURES

“Depth Perception in 3D Clutter”,

- Justus-Liebig-Universitaet Giessen (University of Giessen), Germany (Invited Department colloquium) Aug. 20, 2018
- Max-Planck-Institute for Biological Cybernetics, Tuebingen, Germany (Invited talk at Colloquium celebrating retirement of Director Heinrich Buelthoff) Aug. 22, 2018
- Symposium, Conference on Computer and Robot Vision, Edmonton, May 2017

“Perception of shading from shading, highlights, and mirror reflections”

- International Conf. on Perceptual Organization, York U. (Center for Vision Research), Toronto, June. 2015

“Depth from Blur”

- York University (Center for Vision Research), Toronto, Nov. 2014

“Perception of Shape from Specular Reflections”

- York University (Center for Vision Research), Toronto, Oct 2014

“Visibility probabilities in 3D cluttered scenes”

- York University (Center for Vision Research), Toronto, June 2008
- University of Western Ontario (Dept. of Computer Science) London, Canada. May 2009

“Visual motion computation”

- Harvard University, (Division of Engineering and Applied Science) Cambridge, USA. April 2005
- Yale University (Dept. of Computer Science) New Haven, USA. April 2005
- McGill University, (McGill Vision Research Center, Dept. Ophthalmology), May 2002
- Université de Montreal (Dept. of Computer Science and Operations Research) June, 2002

“Appearance Models for Computer Vision”

- University of Minnesota (Dept. of Psychology) Minneapolis, USA. March 2000
- University of Waterloo (Dept. of Computer Science), Waterloo, Canada. March. 2000
- University of Western Ontario (Dept. of Computer Science) London, Canada. March 2000
- University of Alberta (Dept. of Computer Science) Edmonton, Canada. Feb. 2000
- McGill University (School of Computer Science) Feb. 2000
- York University (Center for Vision Research) Toronto, Canada. Feb. 2000
- University of Toronto (Dept. of Computer Science) Toronto, Canada. Nov. 1999

“Illumination Models for Computer Vision”

- University of Pennsylvania (GRASP Lab), Philadelphia PA, USA. Sept. 1998
- Carnegie Mellon University (Center for Neural Basis of Cognition), USA. April 1998
- Rutgers University-Newark (Dept. of Psychology), Newark, NJ, USA. Feb. 1998
- New York University (Dept. of Psychology), New York, NY, USA. Oct. 1997
- Brown University (Dept. of Cognitive and Linguistic Science), Providence, RI, USA. Feb. 1997
- Rutgers University (Center for Cognitive Science), New Brunswick, NJ, USA. Feb. 1997
- Yale University (Dept. of Computer Science), New Haven, CT, USA. Feb. 1997

“Shape from shading on a cloudy day”

- NEC Research Institute Workshop on Vision, Princeton, NJ, USA. March 1995
- Max-Planck-Institute for Biological Cybernetics. Tübingen, Germany. May 1994
- Royal Institute of Technology (KTH), (Dept. of Computer Science and Numerical Analysis). Stockholm, Sweden. Feb 1994
- University of Hamburg (Dept. of Computer Science), Germany. Jan. 1993
- MIT (Dept. of Brain and Cognitive Sciences), USA. Jan.1992

COURSES TAUGHT

Course	Level	Semesters	Enrollment
Introduction to Computer Science (COMP 250)	Undergraduate	Winter 2009	108
		Winter 2010	130
		Winter 2011	134
		Fall 2012	174
		Fall 2016	406
		Fall 2017	607
		Fall 2018*	656
		Fall 2019	651
Algorithms and Data Structures (COMP 251)	Undergraduate	Winter 2014	186
Introduction to Computer Systems (COMP 273)	Undergraduate	Winter 2002	26
		Winter 2003	18
		Winter 2004	22
		Winter 2005	16
		Winter 2012	89
		Winter 2016	181
Data Compression (COMP 423)	Undergraduate	Fall 2001	51
		Winter 2003	53
		Winter 2004	29
		Winter 2005	26
		Winter 2008	13
Computational Perception (COMP 546) From 2001 to 2011, the course number was COMP 646.	Undergraduate/ Graduate	Fall 2000	12
		Fall 2001	9
		Fall 2002	14
		Fall 2003	19
		Fall 2004	17
		Winter 2006	16
		Winter 2008	13
		Fall 2011	10
		Winter 2013	24
		Fall 2015	15
		Winter 2017	23
		Winter 2018	31
		Winter 2019	38
		Winter 2020	52
Fundamentals of Computer Graphics (COMP 557)	Undergraduate/ Graduate	Winter 2001	51
		Fall 2007	29
		Fall 2008	34
		Winter 2015	117
Fundamentals of Computer Vision (COMP 558)	Undergraduate/ Graduate	Fall 2009	18
		Fall 2010	16
		Fall 2018*	60
		Fall 2020	106

*co-taught

SUPERVISION

PhD students

Student	Graduated	Degree	Thesis topic
M. Scaccia	Fall 2019	Ph.D.	Perception of Occlusion and Luminance in 3D clutter
F. Mannan	Winter 2017	Ph. D.	On Optimal Depth from Defocus
V. Couture	Winter 2012	Ph.D. (U. de Montréal)	Le cinéma omnistéréo ou l'art d'avoir des yeux tout le tour de la tête (<i>co-supervised with Sebastien Roy</i>)
S. McCloskey	Winter 2008	Ph.D.	"Investigating blur in the framework of reverse projection" (<i>co-supervised with K. Siddiqi</i>)

MSc students (graduated)

Student	Grad.date	Thesis	Thesis/Project Title
Yiming Ou	Fall 2019	Project	Density perception
Pierre He	Win 2019	Project	Density perception of 2D dot patterns
Vincent Petrella	Fall 2018	Thesis	Blur discrimination from video for motion in depth (<i>co-supervised with Prof. Paul Kry</i>)
Lixiong Chen	Win 2018	Thesis	Microfacet-based Photometric Stereo for Surfaces with Isotropic Reflectance
Neeth Kunnath	Win 2018	Thesis	Depth from defocus using Angle Sensitive Pixels based on a Transmissive Diffraction Mask
David Bourque	Win 2018	Thesis	Exploring Specular Highlight Streaks on Planar Surfaces
Huaqun Yan	Win 2018	Project	Rendering Optical Snow on a GPU
H. Zheng	Fall 2016	Thesis	Depth perception from visibility and occlusion cues using Oculus Rift
S. Rezvankhah	Fall 2015	Thesis	Depth discrimination in cluttered scenes using fishtank virtual reality
G. Siu	Win 2015	Project	Removal of specular highlights from stereoscopic images.
A. Faisman	Win 2014	Thesis	Qualitative shape perception from specular reflections
T. Wei	Fall 2014	Project	Geometric and PSF Calibration for Depth from Defocus
F. Mannan	Fall 2010	Thesis	"Performance of MRF stereo in 3D cluttered scenes"
Y. Ouyang	Fall 2010	Thesis	"Investigation of specularities on low relief surfaces"
M. Wahab	Fall 2006	Thesis	"Multiresolution motion textures"
D. Rivait	Fall 2006	Thesis	"Three dimensional power spectra of motion parallax in cluttered scenes"
D. Rekhi	Fall 2005	Thesis	"Fluid visualization and fluid solvers"
J. Pereira	Fall 2005	Thesis	"Rendering egomotion using spectral motion texture"
Y. Farasat	Fall 2005	Thesis	"Motion of specularities on undulating surfaces"
A. Bhatia	Fall 2005	Project	"Combining spectral snow with a particle system"
D. Gipsman	Win 2004	Thesis	"Critical points of shading: on intensity maxima"

L. Zhang	Win 2004	Thesis	“Rendering falling snow using Fourier transforms”
H.C. Lai	Fall 2001	Project	“Object reconstruction using shadows” (<i>co-supervised with Prof. K. Siddiqi</i>)

Current graduate students (Last updated 2019)

Student	Dates	Degree	Thesis/Project topic
Junlin Zheng	Fall 2018-	M.Sc.	Music note recognition
Yiran Mao	Fall 2018-	M.Sc.	Machine Learning and Computer Vision
Amanpreet Walia	Fall 2018-	M.Sc.	Machine Learning and Computer Vision
Xavier Morin Duschene	Fall 2018-	M.Sc.	Statistics of natural scenes
Gaspard Nachmias	Fall 2019-	M.Sc.	Computational Photography

Postdoctoral trainees

Name	Dates	Topic
Vincent Couture	Win 2012- Sum 2012	Panoramic stereo videos
Jean Francois Tardif	Fall 2008-Win 2009	Vanishing point detection

Undergraduate Research Projects

Student	Year	Course	Project Title
Gaspard Nahmias	Fall 2019	COMP 400	High dynamic range imaging
Weiyi Xiao	Fall 2018	COMP 402D1	Estimating time to contact
Hannah Jin	Summer 2018	COMP 396	Computational modelling of 2D motion using Gabors
Kyle Levy	Summer 2018	PHYS 489	Estimating camera shake
Dmitrii Tiron	Summer 2017	COMP 396	Blur, Oclusions, and Microparallax
Benjamin Paul-Dubois-Taine	Summer 2017	COMP 400	Tsai & Victor’s Multiscale Neural Model for Representing Binocular Disparity
S. Sun	Winter 2016	COMP 401	Biological Factors in Dynamic L-System Tree Creation
Ryan Siciliano	Fall 2013	COMP 396	Blur and disparity: complementary cues to depth?
Stephan Kaufman	Summer 2011	(visitor from France)	Depth from defocus using graph cuts
R. Breidi	Summer 2010	N/A	Rendering technique for fishtank VR using head tracking
L.Flookes	Fall 2005 + Summer 2006	NSERC USRA	Motion of specularities on smooth surfaces
V. Couture	Winter 2002	COMP 400	Normal mesh compression

PROFESSIONAL SERVICE

Journal Editorial Boards

Associate Editor, *ACM Transactions on Applied Perception*, 2004-present

Guest Editor, *ACM Transactions on Applied Perception* (Special Issue of Papers from 4th ACM Symposium on Applied Graphics and Visualization) 2008

Conference Chair:

Program Co-Chair, 12th Conference on Computer and Robot Vision, Halifax, Canada. June 2015

Program Co-Chair, 11th Conference on Computer and Robot Vision, Montreal, Canada. May 2014

Program Co-Chair, *ACM Symposium on Applied Perception in Graphics and Visualization*, Tuebingen Germany, July 2007

Referee

I typically review over 10 conference papers per year, sometimes as an official member of the program committee and sometimes as an ad hoc basis. Here are some examples:

Symposium on Applied Perception (SAP), 2004-
International Conference on Computer Vision (ICCV) 2001-2015 (odd years)
European Conference on Computer Vision (ECCV) 2002-2015 (even years)
Computer Vision and Pattern Recognition (CVPR) 2001-2016 (annually)
Conference on Computer and Robot Vision, 2004-

I also serve as an ad hoc reviewer for grants with several funding agencies e.g.

NSERC 2007, 2006, 2008, 2012, 2011
National Science Foundation (NSF) 2003, 2005 (area: human visual perception)
Netherlands Organization for Scientific Research (NWO) 2003 (area: human visual perception)

I typically serve as referee for 2-4 journal paper submissions per year, e.g. *Image and Vision Computing*, *Perception*, *Vision Research*, *Journal of Vision*, *Journal of Machine Vision and Applications*, *Computer Vision and Image Understanding*, *IEEE Transactions on Pattern Analysis and Machine Intelligence*, *International Journal of Computer Vision*, *Journal of Machine Vision and Applications*, *ACM Transactions on Applied Perception*

Department Committees

Chair, ad hoc Committee for new Director (2020)
Chair, ad hoc Committee for new Director (2016)
Co-Chair, Undergraduate Committee (2015-)
Associate Director (Space and Finance), 2007-2012
Space Committee, 2003-2005, 2012-2017
Annual Report Coordinator, 2003-2006
Member, Hiring Committee, 2006, 2019
Member, M.Sc. Committee, 2000-2002
Member, Undergraduate Committee, 2002-2003

PhD Committees (Proposal Exams, Defense Committee, Pro-Dean)

Ananda Siddarta 2018 (Neuroscience) ProDean
Jie Dong 2018 (Neuroscience)
Majid Janidarmian 2017 (ECE) Pro-Dean
Baback Samari 2016 (CS)
Amir Rabbani 2016 (CS)
Anqi Xu 2016 (CS)
Emmanuel Piuze-Phaneuf 2014 (CS)
Patrick Mineault 2014 (Neuroscience)
Mehdi Rezagholizadeh 2013 (ECE/CIM)
Amir Rabbani 2010-12, 16 (CS)
Parya Momayyez, 2010-12 (CS/CIM)
Ahmad Yoonessi, 2010-2012 (Neuroscience)
S. Skaff, 2009 (ECE/CIM)
Y. Girdhar, 2009 (CS)
Ali Yoonessi, 2008 (Ophthalmology)
G. Gill, 2009 (ECE/CIM)
S. Arseneau, 2001-2005 (ECE/CIM) J. Yin,
2001-6 (ECE/CIM)
S. Pelletier, 2004-7 (ECE/CIM)
P. Savajiev, 2005-8 (SOCS/CIM)
S. Robbins, 2000 (SOCS)
A. Torrez Mendez, 2001 (SOCS/ CIM)
T. Ehtiati, 2004 (ECE/CIM)
J. Harrison 2006, 2009 (ECE/CIM)
P. Giguere, 2007 (SoCS)
Yiannis Rekleitis, 2002 (SOCS/CIM)
Steven Robbins, 2003 (SOCS)
S. Benoit, 2003 (ECE/CIM)
Z. Hafed, 2003 (ECE/CIM)
Robert Sim, 2004 (SOCS/CIM)
D. Hernandez-Alonso, 2005 (ECE/CIM)
S. Simhon, 2005 (SoCS)
E. Bourque 2000-2005 (SoCS)

Reviewer for MSc Thesis

Benedicte Leonard-Cannon, 2016, MSc (CS)

Yasin Nazzar, 2015, M.Eng (ECE/CIM)

Lian Xin He, 2014. M.Sc. (Computer Science, McGill University)

Malika Mahjani, 2009, M. Eng. (ECE)

R. Farivar-Mohseni, 2002. M.Sc. (Dept. of Psychology, McGill University)

J. Yao, 2002. M.Eng. (ECE/CIM, McGill University)

F. Wang, 2001. M.Eng. (ECE/CIM , McGill University)