

March 2016

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Professor of Cognitive Sciences

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Education

Ph.D. University of Rochester, Rochester, NY, 1990, Psychology

M.A. University of Rochester, Rochester, NY, 1986, Psychology

B.A. Harvard College, Cambridge, MA, 1979, German Studies

Positions

2012 Acting Chair, Department of Cognitive Sciences, UC Irvine

2005-10 Chair, Department of Cognitive Sciences, UC Irvine

1998- Professor of Cognitive Sciences, UC Irvine

1998-02 Director, UC Irvine VR Lab and Center for Virtual Reality

1997 Visiting Scientist, Max-Planck-Institut für biologische Kybernetik, Tübingen

1995-96 Professeur Invité, Université Jean Monnet de Saint-Etienne

1994- Associate Professor of Cognitive Sciences, UC Irvine

1990-94 Assistant Professor of Cognitive Sciences, UC Irvine

1988-90 Acting Assistant Professor of Cognitive Sciences, UC Irvine

1987-88 Research Associate, Center for Visual Science, Univ. Rochester, New York

Fellowships and Honors

1998/99 American Psychological Association Distinguished Scientific Award for Early Career Contribution to Psychology

1997 Deutsche Akademischer Austauschdienst Scholarship

1995/96 Bourse d'Accueil Fellowship, Région Rhône-Alpes, France

1995 UC Irvine School of Social Sciences Computer-Aided Learning Fellowship

1993 Society for Mathematical Psychology, New Investigator Award

1985-87 IBM Graduate Student Fellowship

1984 NEI-ARVO Young Investigators Travel Fellowship

Grants

Army Research Office W911NF-10-1-0163, PI, "Instrumentation for Mobile Brain-Computer Interface Research", 6.01.10-5.31.11, \$151,130

Army Research Office 54228-LS-MUR, PI, "Silent Spatialized Communication among Dispersed Forces", 7.1.08-9.30.14, \$4.1M

UCI CORCLR SIIG-2006-2007-7, PI, "Spatial Pattern Hearing", 7.1.07-6.30.08, \$5000

NASA-Ames University Consortium NCC2-5378, PI, "Optimization of Perceptual Transparency in Synthetic Vision Displays", 4.1.00-3.31.01, \$20,791

Public Health Services NEI EY10014, PI, "Studies of Color Pattern Appearance and Detectability", 1.1.98-12.31.03, \$845,942

National Science Foundation DBI-9724595, PI, "Acquisition of Equipment for a Virtual Reality Laboratory for Vision, Visuomotor and Synthetic Environment Research", 9.1.97-8.31.99, \$530,000
National Science Foundation SBR-9512397, co-PI, "Computer for Mathematical Behavioral Sciences", 8.1.95-7.31.96, \$34,360
Public Health Services NEI R29 EY10014, PI, "Studies of Color Pattern Appearance and Detectability", 1.1.93-12.31.97, \$351,951
UC Irvine Committee on Research 89/90-38, PI, "An Investigation of Visual Image Ambiguity using Group-Theoretic Methods", 7.1.90-6.30.91, \$10,000
NASA-Ames University Consortium NCA2-509, PI, "Color in Visual Search", 4.1.90-3.31.91, \$15,000

Editorial Work

NIH/NEI Vis B/Central Visual Processing Study Section Member, Fall 2000, 2003-2008; UC DIMI Executive Board Member, 2000-2002; Member of *Vision Research* editorial board 1997-2005; referee for *Applied Optics*, Biotechnology and Biological Sciences Research Council, *Color Research and Applications*, *Displays*, Human Frontier Science Program, *J. Computational Neuroscience*, *J. Experimental Psychology*, *J. Optical Society of America*, National Institute of Mental Health, National Science Foundation, Army Research Office, *Perception*, *Perception & Psychophysics*, *Journal of Vision*, The Wellcome Trust

Committee and Other Membership at UC Irvine

Academic Senate Representative Assembly, 1991-1994
Advanced Scientific Computing Allocation & Steering Committee, 1990-1995
Educational Technology Task Force, 1995
Schoolwide Executive Committee, Social Sciences, 1995
Graduate Committee, Department of Cognitive Sciences, 1992-1995
Executive Committee, Institute for Mathematical Behavioral Sciences, 1995, 1999/2000, 2002-07
Computer Committee, Institute for Mathematical Behavioral Sciences, 1991-, Chair, 1994-95
Founder, Organizer, School of Social Sciences World Wide Web Seminar, 1995-1997
Computer Use Committee, School of Social Sciences, 1997/98
Faculty Recruitment Committee, Department of Cognitive Sciences, 1998/99
University Research Park Faculty Advisory Committee 1998/99
Search Committee Member, School of Social Sciences Assistant Dean, 1998/99
Committee on Courses, 1997-2000, Chair, 1999/2000
Conflict of Interest Oversight Committee, 1998-2001
Search Committee Member, Vice Chancellor for Research and Graduate Studies, 1999/2000
Acting Director, Institute for Mathematical Behavioral Sciences, UC, Fall 2001
Council on Educational Policy, Member, 2002/2003
Change of Major Ad Hoc Committee, Member, 2003
Ad Hoc CAP Review 2000, 2001
Conflict of Interest Oversight Ad Hoc Committee, Spring 2003
Working Group on Classroom Environment and Facilities, 2003-2004
Ad Hoc Committee to Review PacRim Proposals, Winter 2004
Conflict of Interest Oversight Committee, Ad Hoc Subcommittee, 2004
Research Advisory Committee, 2007-08

Judge, UCI AGS Graduate Symposium, April 18, 2014

Publications

- D'Zmura, M. & Lennie, P. (1986). Shared pathways for rod and cone vision. *Vision Research* **26**, 1273-1280.
- D'Zmura, M. & Lennie, P. (1986). Mechanisms of color constancy. *Journal of the Optical Society of America A* **3**, 1662-1672.
- Lennie, P. & D'Zmura, M. (1988). Mechanisms of color vision. *Critical Reviews in Neurobiology* **3**, 333-400.
- D'Zmura, M. (1991). Color in visual search. *Vision Research* **31**, 951-966.
- D'Zmura, M. (1991). Shading ambiguity: reflectance and illumination. In *Computational Models of Visual Processing*, Landy, M. S. and Movshon, A. J. (Eds.) Cambridge: MIT Press, 187-207.
- D'Zmura, M. (1992). Color constancy: surface color from changing illumination. *Journal of the Optical Society of America A* **9**, 490-493.
- D'Zmura, M. & Iverson, G. (1992). Color constancy: adaptation to the illumination environment. *Optical Society of America Topical Meeting on Advances in Color Vision Technical Digest*, 107-109.
- D'Zmura, M. & Iverson, G. (1993). Color constancy. I. Basic theory of two-stage linear recovery of spectral descriptions for lights and surfaces. *Journal of the Optical Society of America A* **10**, 2148-2165.
- D'Zmura, M. & Iverson, G. (1993). Color constancy. II. Results for two-stage linear recovery of spectral descriptions for lights and surfaces. *Journal of the Optical Society of America A* **10**, 2166-2180.
- Kakarala, R., Bennett, B., Iverson, G. J. & D'Zmura, M. (1993). Bispectral techniques for spherical functions. *Proceedings of the IEEE Int'l Conference on Acoustics, Speech and Signal Processing, Minneapolis, IV*, 216-220.
- D'Zmura, M. & Iverson, G. (1994). Color constancy. III. General linear recovery of spectral descriptions for lights and surfaces. *Journal of the Optical Society of America A* **11**, 2389-2400.
- D'Zmura, M. & Mangalick, A. (1994). Detection of contrary chromatic change. *Journal of the Optical Society of America A* **11**, 543-546.
- Iverson, G. & D'Zmura, M. (1994). Criteria for color constancy in trichromatic bilinear models. *Journal of the Optical Society of America A* **11**, 1970-1975.
- Singer, B. & D'Zmura, M. (1994). Color contrast induction. *Vision Research* **34**, 3111-3126.
- D'Zmura, M., Iverson, G. & Singer, B. (1995). Probabilistic color constancy. In *Geometric Representations of Perceptual Phenomena*, Luce, R.D., D'Zmura, M., Hoffman, D.D., Iverson, G. & Romney, K. (Eds.) Mahwah, NJ: Lawrence Erlbaum Associates, 187-202.
- Iverson, G. & D'Zmura, M. (1995). Color constancy: spectral recovery using trichromatic bilinear models. In *Geometric Representations of Perceptual Phenomena*, Luce, R.D., D'Zmura, M., Hoffman, D.D., Iverson, G. & Romney, K. (Eds.) Mahwah, NJ: Lawrence Erlbaum Associates, 169-185.
- Luce, R.D., D'Zmura, M., Hoffman, D.D., Iverson, G. & Romney, K., Eds. (1995) *Geometric Representations of Perceptual Phenomena: Articles in Honor of Tarow Indow's 70th Birthday*. Mahwah, NJ: Lawrence Erlbaum Associates.

- Singer, B. & D'Zmura, M. (1995). Contrast gain control. A bilinear model for chromatic selectivity. *Journal of the Optical Society of America A* **12**, 667-685.
- D'Zmura, M. (1996) Bergmann on visual resolution, *Perception* **25**, 1223-1234, Translation of Bergmann, C., Anatomisches und Physiologisches über die Netzhaut des Auges, *Zeitschrift für rationelle Medizin II*, 1857, 83-108.
- D'Zmura, M. & Singer, B. (1996). Spatial pooling of contrast in contrast gain control. *Journal of the Optical Society of America A* **13**, 2135-2140.
- D'Zmura, M. (1997). Neural network for color contrast gain control. *Proceedings of the European Symposium on Artificial Neural Networks 1997, Bruges, Belgium*, 67-72
- Colantoni, P., D'Zmura, M., Knoblauch, K. & Laget, B. (1997). Detection of color transparency. In Rogowitz, B. & Pappas, J. (Eds.) *Human Vision and Electronic Imaging II* **3016**, 360-368.
- D'Zmura, M., Lennie, P. & Tiana, C. (1997). Color search and visual field segregation. *Perception & Psychophysics* **59**, 381-388.
- D'Zmura, M., Colantoni, P., Knoblauch, K. & Laget, B. (1997). Color transparency. *Perception* **26**, 471-492.
- D'Zmura, M. (1998). Color contrast gain control. In *Color Vision*, Backhaus, W., Kliegl, R. & Werner, J. (Eds.) Berlin: Walter de Gruyter, 251-266.
- D'Zmura, M. & Iverson, G. (1998). A formal approach to color constancy: the recovery of surface and light source spectral properties using bilinear models. In *Recent Progress in Mathematical Psychology*, Dowling, C., Roberts, F. & Theuns, P. (Eds.) Mahwah, NJ: Lawrence Erlbaum Associates, 99-132.
- D'Zmura, M. & Knoblauch, K. (1998). Spectral bandwidths for the detection of color. *Vision Research* **38**, 3117-3128.
- D'Zmura, M., Shen, T. J. S., Wu, W., Chen, H. & Vassiliou, M. (1998). Contrast gain control for color image quality. In Rogowitz, B. & Pappas, J. (Eds.) *Human Vision and Electronic Imaging III* **3299**, 194-201.
- Chen, V. J. & D'Zmura, M. (1998). Convergence model for the perception of color transparency. *Perception* **27**, 595-608.
- D'Zmura, M., Knoblauch, K., Colantoni, P., Henaff, M.-A. & Michel, F. (1998). Dependence of color on context in a case of cortical color vision deficiency. *Vision Research* **38**, 3455-3459.
- D'Zmura, M. & Singer, B. (1999). Contrast gain control. In *Color Vision: From Genes to Perception*, Sharpe, L.T. & Gegenfurtner, K.R. (Eds.) New York: Cambridge University Press, pp. 369-385.
- D'Zmura, M., Colantoni, P. & Seyranian, G.D. (2000). Visualization of events from arbitrary spacetime perspectives. In Erbacher, R.F., Chen, P.C., Roberts, J.C. & Wittenbrink, C.M. (Eds.) *Visual Data Exploration and Analysis VII* **3860**, 35-40.
- D'Zmura, M., Rinner, O. & Gegenfurtner, K. R. (2000). The colors seen behind transparent filters. *Perception* **29**, 911-926.
- Hagedorn, J. & D'Zmura, M. (2000). Color appearance of surfaces viewed through fog. *Perception* **29**, 1169-1184.
- D'Zmura, M., Colantoni, P. & Hagedorn, J. (2001). Perception of color change. *Color Research and Applications* **S26**, S186-S191.
- Knoblauch, K. & D'Zmura, M. (2001). Lights and neural responses do not depend on choice of color space. *Vision Research* **41**, 1683-1684.

- D'Zmura, M., Colantoni, P. & Seyranian, G. (2001). Virtual environments with four or more spatial dimensions. *Presence* **9**, 616-631.
- D'Zmura, M. (2002). Psychology of colour perception. In *Encyclopedia of Cognitive Science*. London: MacMillan.
- D'Zmura, M. (2003). Color and the processing of chromatic information. In *Colour Perception: From Light to Object*, Mausfeld, R. & Heyer, R. (Eds.) Oxford: Oxford University Press, pp. 143-152.
- Ge, M. & D'Zmura, M. (2003). 4D structure from motion: a computational algorithm. Bouman, C.A. & Stevenson, R.L. (Eds.) *Computational Imaging (Proc. SPIE/IS&T Volume 5016)*, 13-23.
- D'Zmura, M., Deng, S., Lappas, T., Thorpe, S. & Srinivasan, R. (2009). Toward EEG sensing of imagined speech. Jacko, J.A. (Ed.), *Human-Computer Interaction, Part I, HCII 2009, LNCS 5610* (Berlin: Springer) 40-48.
- Srinivasan, R., Thorpe, S., Deng, S., Lappas, T. & D'Zmura, M. (2009). Decoding attentional orientation from EEG spectra. Jacko, J.A. (Ed.), *Human-Computer Interaction, Part I, HCII 2009, LNCS 5610* (Berlin: Springer), 176-183.
- Deng, S., Srinivasan, R., Lappas, T. & D'Zmura, M. (2010). EEG classification of imagined syllable rhythm using Hilbert spectrum methods. *J. Neural Engineering* **7**, 1-13.
- Thorpe, S., D'Zmura, M. & Srinivasan, R. (2011). Lateralization of frequency-specific networks for covert spatial attention to auditory stimuli. *Brain Topography* DOI: 10.1007/s10548-011-0186-x
- Chi, X., Hagedorn, J.B., Schoonover, D. & D'Zmura, M. (2011). EEG-based discrimination of imagined speech phonemes. *International Journal of Biomagnetism* **13(4)**, 201-206.
- Horton, C., D'Zmura, M. & Srinivasan, R. (2011). EEG reveals divergent paths for speech envelopes during selective attention. *International Journal of Biomagnetism* **13(4)**, 217-222.
- Bhandari, S., Edberg, D., Rose, M., Yaralian, H., Krichmar, J., D'Zmura, M. & Gates, W. (2012). Tracking of mobile targets using unmanned aerial vehicles. *Proceedings of the AIAA Guidance, Navigation, and Control Conference 2012, 13-16 August 2012, Volume 1*, 3958-3970.
- Horton, C., D'Zmura, M. & Srinivasan, R. (2013). Suppression of competing speech through entrainment of cortical oscillations. *J. Neurophysiology* **109**, 3082-3093.
- Deng, S., Srinivasan, R. & D'Zmura, M. (submitted). Cortical signatures of heard and imagined speech envelopes. *J. Neural Engineering*.
- Horton, C., Srinivasan, R. & D'Zmura, M. (2014). Envelope responses in single-trial EEG indicate attended speaker in a "cocktail party". *Journal of Neural Engineering* **11**, 046015, 1-22.
- Baltzell, L.S., Horton, D., Shen, Y., Richards, V.M., D'Zmura, M. & Srinivasan, R. (submitted). Attention influences object formation by selectively modulating cortical entrainment in different frequency regions.
- Dennison, M.S., Wisti, A.Z., & D'Zmura, M. (submitted) Use of physiological signals to predict cybersickness.
- Dennison, M.S., & D'Zmura, M. (submitted). Cybersickness without the wobble: experimental results speak against postural instability theory.

Published Abstracts

- D'Zmura, M. & Lennie, P. (1984). Spatial contrast sensitivities of rods and cones measured concurrently. *Investigative Ophthalmology and Visual Science*, **25**, Suppl., 53.
- D'Zmura, M. & Lennie, P. (1986). Hue constancy using specular reflection. *Investigative Ophthalmology and Visual Science*, **27**, Suppl., p. 292.
- D'Zmura, M., Krauskopf, J. & Lennie, P. (1987). Hue selectivity revealed by heterochromatic noise masking. *Investigative Ophthalmology and Visual Science*, **28**, Suppl., 92.
- D'Zmura, M., Møller, P. & Lennie, P. (1988). Attentional selection of chromatic mechanisms. *Investigative Ophthalmology and Visual Science*, **29**, Suppl., 162.
- Tiana, C., Lennie, P. & D'Zmura, M. (1989). Parallel search for color/shape and color/motion conjunctions. *Investigative Ophthalmology and Visual Science*, **30**, Suppl., 160.
- D'Zmura, M. (1989). The visual determination of surface material properties. *Investigative Ophthalmology and Visual Science*, **30**, Suppl., 160.
- D'Zmura, M., Iverson, G. & Yellott, J. (1990). Rotation-invariant recognition and generalized autocorrelation. *OSA Annual Meeting Technical Digest*, **15**, 50.
- D'Zmura, M. & Iverson, G. (1992). Color structure from chromatic motion. *Optical Society of America Annual Meeting 1992 Technical Digest*, 51.
- Singer, B. & D'Zmura, M. (1992). Color contrast gain control. *Optical Society of America Annual Meeting 1992 Technical Digest*, 62.
- D'Zmura, M. & Iverson, G. (1992). Bilinear model adaptation to the chromatic environment. *Optical Society of America Annual Meeting 1992 Technical Digest*, 70.
- Singer, B., Han, K.-H. & D'Zmura, M. (1993). Color selectivity in contrast gain control. *Investigative Ophthalmology and Visual Science*, **34**, Suppl., 764.
- D'Zmura, M. & Iverson, G. (1993). Color constancy: feasibility and recovery. *Investigative Ophthalmology and Visual Science*, **34**, Suppl., 748.
- D'Zmura, M., Iverson, G. & Singer, B. (1994). Probabilistic color constancy. *Investigative Ophthalmology and Visual Science*, **35**, Suppl., 1656.
- Singer, B., D'Zmura, M., Iverson, G., Lewis, D. J. & Dinh, L. (1994). A bilinear model for color contrast induction. *Investigative Ophthalmology and Visual Science*, **35**, Suppl., 1656.
- D'Zmura, M., Singer, B., Dinh, L., Kim, J. & Lewis, J. (1994). Spatial sensitivity of contrast induction mechanisms. *Optical Society of America Annual Meeting 1994 Program*, 48.
- Singer, B., Montag, E. & D'Zmura, M. (1995). Spatial opponency at isoluminance. *Investigative Ophthalmology and Visual Science*, **36**, Suppl., S664.
- D'Zmura, M., Singer, B. & Li, C. (1995). A bilinear model for contrast gain control. *Investigative Ophthalmology and Visual Science*, **36**, Suppl., S392.
- D'Zmura, M. & Knoblauch, K. (1996). Spectral bandwidths of color detection mechanisms. *Perception* **25**, Supplement, 15.
- Chen, V. & D'Zmura, M. (1997). Psychophysical evidence for convergence model of color transparency. *Investigative Ophthalmology and Visual Science*, **38**, S897.
- Knoblauch, K. & D'Zmura, M. (1997). Spectral bandwidths of color mechanisms evaluated with sectorized noise. *Investigative Ophthalmology and Visual Science*, **38**, S255.
- Za, S. & D'Zmura, M. (1997). Phase selectivity in contrast induction. *Investigative Ophthalmology and Visual Science*, **38**, S632.
- D'Zmura, M., Knoblauch, K., Colantoni, P., Henaff, M.-A. & Michel, F. (1997). Dependence of color on context in a case of cerebral achromatopsia. *Proceedings of the XIVth Symposium of the International Research Group on Colour Vision Deficiencies*, 36.

- D'Zmura, M., Shen, T.P.J., Wu, W., Chen, H., & Vassiliou, M. (1998). Contrast gain control for color image quality. *1998 IS&T/SPIE Symposium on Electronic Imaging Science and Technology*, 69.
- D'Zmura, M., Rinner, O. & Gegenfurtner, K. (1998). The colors seen behind color filters. *Investigative Ophthalmology and Visual Science*, **39**, S445.
- D'Zmura, M., Rinner, O. & Gegenfurtner, K. (1998). Color and lightness of a surface seen behind a transparent filter. *Perception* **27**, Supplement, 170.
- Za, S., Iverson, G., & D'Zmura, M. (1999). Classifying trichromatic bilinear models for color constancy. *Investigative Ophthalmology and Visual Science*, **40**, S748.
- Hagedorn, J. & D'Zmura, M. (1999). Color appearance of surfaces viewed through fog. *Investigative Ophthalmology and Visual Science*, **40**, S750.
- Knoblauch, K., Thomas, J.P., & D'Zmura, M. (1999). Feedback, temporal frequency and stimulus classification. *Investigative Ophthalmology and Visual Science*, **40**, S792.
- Seyranian, G.D., Krug, B., Richman, S., & D'Zmura, M. (1999). Search and navigation in four-dimensional environments. *Investigative Ophthalmology and Visual Science*, **40**, S801.
- D'Zmura, M. (1999). Perception of color change. *International Colour Vision Society XVth Symposium, Göttingen, Germany*, T26.
- Seyranian, G., Colantoni, P., & D'Zmura, M. (1999). Navigation in environments with four spatial dimensions. *Perception* **28**, Supplement, 7.
- D'Zmura, M., Colantoni, P. & Seyranian, G. (2000). Visualization of events from arbitrary spacetime perspectives. *Visual data exploration and analysis VII*, 134-135.
- Hagedorn, J. & D'Zmura, M. (2000). Dependence of perceived shape on spatial frequency content of the pattern of lighting. *Investigative Ophthalmology and Visual Science*, **41**, S217.
- D'Zmura, M., Colantoni, P. & Hagedorn, J. (2000). Perceived ordering in depth of transparent filters using chromatic cues. *Investigative Ophthalmology and Visual Science*, **41**, S240.
- Hagedorn, J. & D'Zmura, M. (2001). Effects of shadow, simultaneous contrast, transparency and distant x-junctions on surface appearance. *Investigative Ophthalmology and Visual Science*, **42**, S50.
- Seyranian, G. & D'Zmura, M. (2001). Global orientation and distance estimation in four-dimensional virtual environments. *Investigative Ophthalmology and Visual Science*, **42**, S121.
- D'Zmura, M. (2002). Color scission and transparency. *Journal of Vision* **2**(10), 45.
- Ge, M. & D'Zmura, M. (2003). 4D structure from motion: a computational algorithm. *IS&T/SPIE's Electronic Imaging 2003: Science and Technology*, 5016-2, 243.
- Thorpe, S.G., Srinivasan, R., Deng, S., Lappas, T., D'Zmura, M. (2009). Auditory spatial attention is predicted by EEG spectral features. Society for Neuroscience Annual Meeting Chicago 2009 Abstract FF13-673.15.
- Lappas, T., D'Zmura, M., Thorpe, S., Deng, S. & Srinivasan, R. (2009). Predictive classification of imagined speech using EEG. Society for Neuroscience Annual Meeting Chicago 2009 Abstract FF15-673.17.
- D'Zmura, M., Deng, S., Lappas, T., Thorpe, S. & Srinivasan, R. (2009). EEG classification of imagined syllable rhythm using Hilbert spectrum methods. Society for Neuroscience Annual Meeting Chicago 2009 Abstract FF16-673.18.
- Lappas, T. & D'Zmura, M. (2011). Discriminating imagined speech using EEG. *Neuroscience 2011*.

- Schoonover, D., Chi, X., Hagedorn, J. & D'Zmura, M. (2011). Articulator-based phonemes could prove useful in an imagined-speech based brain computer interfacing. *Neuroscience 2011*.
- Coleman, R., Li, A. & D'Zmura, M. (2011). Multi-way classification of covert visual spatial attention in two dimensions. *Neuroscience 2011*.
- Coleman, R.A., Li, A. & D'Zmura, M. (2012). SSVEPs generated by unattended flickering fields can be used to predict the locus of covert spatial attention. 42nd annual meeting of the Society of Neuroscience, New Orleans, LA.
- Horton C., Srinivasan R., and D'Zmura, M. (2013). Envelope-locked EEG signals permit robust classification of attended speaker. Presented at the 43rd Annual Meeting of the Society for Neuroscience, San Diego, CA.

Invited Presentations

- Color in visual search. MIT Center for Brain & Information Processing, December 1988.
- Constraints on the recovery of surface reflectance. Cold Spring Harbor Symposium on Computational Models of Visual Processing, Cold Spring Harbor, June 1989.
- Color perception and detection. National Research Council, Committee on Vision, Winter Meeting on Visual Search, Irvine, January 1990.
- Color in visual search. UC Berkeley School of Optometry, March 1990.
- The detection of color. Smith-Kettlewell Institute for Visual Science, March 1990.
- Color in visual search. NASA-Ames Human Interface Research Branch, March 1990.
7. Analysis of illumination. Center for Visual Science, Univ. Rochester, October 1990.
- Color structure from chromatic motion. NASA-Ames Vision Research Laboratory, Moffett Field, California, January 1992.
- Color constancy: adaptation to the illumination environment. OSA Topical Meeting on Advances in Color Vision, Irvine, California, January 1992.
- Color structure from chromatic motion. Dept. Psychology, UC Santa Barbara, November 1992.
- Color constancy. Cognitive Sciences Forum, UCLA, January, 1993.
- Probabilistic color constancy. Geometric Representations of Perceptual Phenomena Conference, in honor of Tarow Indow, UC Irvine Institute for Mathematical Behavioral Sciences, July 1993.
- Color vision. Dept. Physics, UC Irvine, October 1993.
- Color constancy: spectral recovery using bilinear models. New Investigator Award Address, Annual Meeting, Society for Mathematical Psychology, Seattle, August 1994.
- Introductory psychology on the World Wide Web. Conference on Computing for the Social Sciences 1995, San Diego Supercomputing Center, June 1995.
- Lights and mechanisms. Optical Society of America Annual Meeting, September 1995, Portland, Oregon.
- Contrast gain control. Institut de l'Ingenierie de la Vision, University Jean Monnet de St. Etienne, France, October 1995.
- Contrast gain control. Laboratoire de l'Informatique du Parallelisme, École Normale Supérieure de Lyon, France, November 1995.
- Color in human and computer vision. École des Mines de St. Etienne, France, December 1995.
- Visual contrast gain control. INSERM Cerveau et Vision, Unité 371, Lyon, France, December 1995.

- Visual contrast gain control. 1ère Journée Vision en Rhône-Alpes, Lyon, France, February, 1996.
- Color contrast gain control. Symposium on Color Vision, organized by the Freie Universität Berlin and the Universität Potsdam, held at the Einstein Forum in Potsdam, Germany, February 1996.
- Contrast gain control. Max Planck Institut für biologische Kybernetik, Tübingen, Germany, February 1996.
- Colour transparency. Colour in Context meeting at Durham University, England, April 1996.
- Contrast gain control. Institut für Hirnforschung, Universität Freiburg, Germany, June 1996.
- Perception et analyse d'images couleur. Institut d'Ingenierie de la Vision, Saint-Etienne, France, June 1996.
- Colour transparency. Craik Club, Dept. Experimental Psychology, University of Cambridge, England, June 1996.
- Contrast gain control. Color Vision: From Genes to Perception workshop at the Max Planck Institute for Biological Cybernetics, Tübingen, Germany, September 1996.
- Contrast induction. Dept. Psychology, UC Santa Barbara, November, 1996.
- Psyberlab: A virtual environment for introductory psychology. University of California All University Conference on Teaching and Learning Technologies, UCLA, March, 1997.
- Neural network for color contrast gain control. European Symposium on Artificial Neural Networks 1997, April 1997, Bruges, Belgium.
- Color transparency. INSERM Cerveau et Vision, Unité 371, Lyon, France, April 1997.
- Human visual function and the assessment of visual image quality. Rockwell Science Center, Thousand Oaks, California, May 1997.
- Color contrast gain control. Dept. Mathematics and Computer Science, University of Würzburg, Germany, July 1997.
- Color transparency. Sommerhausen Neural Net Conference 1997, Sommerhausen, Germany, July 1997.
- Contrast gain control. Institut für Neuroinformatik, Ruhr-Universität Bochum, Germany, August 1997.
- Color transparency. Departments of Psychology and Computer Science at Christian Albrechts Universität, Kiel, Germany, August 1997.
- Color transparency. Max-Planck-Institut für biologische Kybernetik, Tübingen, Germany, August 1997.
- Color transparency. Department of Psychology, University of Colorado, Boulder, October 1997.
- PsyberLab: A virtual environment for introductory psychology. For DeAnza Community College at Silicon Graphics, Inc., Mountain View, California, November 1997.
- Using Technology in the Classroom. John Wiley & Sons Western Conference for the Teaching of Psychology at California State University, Long Beach, March 1998.
- Behavior in virtual environments. Young President's Organization, Pasadena, California, May 1999.
- Perception of color change. International Colour Vision Society Bi-annual Meeting, Göttingen, Germany, July 1999.
- 4D virtual environments. HRL Laboratories, Malibu, California, December 1999.
- 4D virtual environments. Jet Propulsion Laboratory, Pasadena, California, February 2000.
- 4D virtual environments. Department of Psychology, Santa Barbara, California, June 2000.

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- Jericho *Displays*: a window graphical user interface for 3D games. UC DiMI Technology and Content Forum. Microsoft, Silicon Valley campus, Mountain View, California, October 2001.
- Looking through opaque surfaces. Color Perception: Philosophical and Scientific Perspectives. UCSD Department of Philosophy, October 2002.
- Transparency and scission. Plenary lecture, Fall Vision Meeting, Optical Society of America Vision and Color Technical Groups, San Francisco, October 2002.
- Layers of visual information: their detection and interpretation, and their impact on visibility. Distinguished lecture, The Schepens Eye Institute, Boston, April 2007.
- Silent spatialized communication among dispersed forces. ARO Workshop on Neuroergonomics and Neuromorphics, University of Maryland, College Park, October 2008.
- Toward EEG sensing of imagined speech. Session on Physiological Signal Monitoring in Human-Computer Interaction at HCI International 2009 San Diego, July 2009.
- Synthetic telepathy: human brain-computer interfaces. Invited presentation to the CNO Strategic Studies Group XXIX, US Naval War College, Newport, RI, December 14, 2009.
- Intended direction and imagined speech from EEG. Invited presentation to the Dept. Cognitive Sciences, UC San Diego, May 2010.