Christopher DiMattina, Ph.D.

Contact Information	Department of Psychology Florida Gulf Coast University 10501 FGCU Blvd. South Fort Myers, FL 33965-6565 USA	Office: (239)-590-1513 Cell: (239)-628-2415 E-mail: cdimattina@fgcu.edu Web: itech.fgcu.edu/faculty/cdimattina/	
Research Interests	Vision science, computational neuroscience, machine learning		
Faculty Appointments	Florida Gulf Coast University, Ft. Myers, FL USA		
	Associate Professor of Psychology/Cognitive Neuroscience, August 2018–present		
	Assistant Professor of Psychology/Cognitive Neuroscience, August 2013–July 2018		
	Grinnell College, Grinnell, IA USA		
	Visiting Assistant Professor of Psychology/Neuroscience, August 2012–August 2013		
Postdoctoral Experience	Case Western Reserve University, Cleveland, OH USA		
	Research Associate, Computer Science, August 2009–July 2012Advisor: Michael S. Lewicki, Ph.D.		
Education	The Johns Hopkins University School of Medicine, Baltimore, MD USA		
	 Ph.D., Computational Neuroscience, September 2000-July 2009 Awarded by Solomon H. Snyder Department of Neuroscience Thesis: Neural network analysis of sensory processing and active data collection Advisor: Kechen Zhang, Ph.D., Biomedical Engineering (2005-2009) 		
	Cornell University, Ithaca, NY USA		
	B.A., Mathematics, Psychology & ColConcentrations in Cognitive StudiesPhi Beta Kappa, Magna cum Laude	lege Scholar, August 1994–August 1998 s & Biological Psychology e	
Scientific Courses	Woods Hole Marine Biological Labor	ratory, Woods Hole, MA USA	
	Methods in Computational Neuroscience, August 2003		
	University of California at Berkeley, Berkeley, CA USA		
	Mining and Modeling of Neuroscience Data, July 2011		
Academic Honors	 Cornell University Magna cum Laude, 1998 Phi Beta Kappa, 1998 Pauline and Irving Tanner Dean's School College Scholar Program, 1995–1998 	blar, 1994—1998	

Research			
GRANTS	 National Institutes of Health: NIDCD National Research Service Award (Predoctoral) F31-DC05892, 2002-2005 Title: Neural encoding of primate vocalizations in auditory cortex National Institutes of Health: National Eye Institute (NEI) R-15 AREA Award EY032732-01, 2021-2024 Title: Perceptual integration of luminance, texture and color cues for visual boundary segmentation Amount: \$374,000 over 3 years 		
Teaching Experience	Florida Gulf Coast University, Fort Myers, FL USA		
	Fall 2021-present: Instructor of record for 2 courses per semester (2-2 teaching load with grant buyout).		
	EXP-3202: Sensation and PerceptionPSB-4002: Brain and Behavior		
	Fall 2013 - Spring 2021: Instructor of record for 3 courses per semester. Courses taught during this time period at FGCU:		
	 EXP-3202: Sensation and Perception PSB-4002: Physiological Psychology PSY-2012: General Psychology PSY-3205: Survey of Analytical Techniques PSY-3017: Experimental Psychology 		
	Grinnell College, Grinnell, IA USA		
	Fall 2012 - Spring 2013: Instructor of record for 2 courses per semester		
	 PSY 295: Sensation and Perception, Fall 2012 NRS 495: Neuroscience Seminar in Vision Science, Fall 2012 PSY 113: Introduction to Psychology (two sections with lab), Spring 2013 		
	Case Western Reserve University, Cleveland, OH USA		
	Spring 2010 - Spring 2012: Guest lecturer		
	 EECS 531: Computer Vision, Spring 2012 EECS 600: Computational Perception, Spring 2011 EECS 600: Computational Perception, Spring 2010 		
	The Johns Hopkins University School of Medicine, Baltimore, MD USA		
	Spring 2002 - Spring 2008: Teaching assistant and discussion section leader		
	 440.800: Neuroscience A, Spring 2008 440.800: Neuroscience A, Spring 2006 		

• 440.770: Physiology of the Central Nervous System, Spring 2002

- PUBLICATIONS DiMattina, C. & Baker, C.L. Jr. (2021). Segmenting surface boundaries using luminance cues. *Scientific Reports* 11: 10074.
 - Pipitone, R.N., & DiMattina, C. (2020). Object clusters or spectral energy? Assessing the relative contributions of image phase and amplitude spectra to Trypophobia. *Frontiers in Psychology: Perception Science* 11:1847.
 - DiMattina, C., & Baker, C.L. Jr. (2019). Modeling second-order boundary perception: A machine learning approach. *PLoS Computational Biology* 15(3): e100629.
 - DiMattina, C., & Zhang, K. (2017). Adaptive stimulus optimization. In: Jaeger, D. and Jung, R. (Eds.) *Encyclopedia of Computational Neuroscience (2nd Ed.)*. Springer.
 - **DiMattina, C.** (2016). Comparing models of contrast gain using psychophysical experiments. *Journal of Vision* 16(9): 1-18.
 - DiMattina, C. (2015). Fast adaptive estimation of multi-dimensional psychometric functions. *Journal of Vision* 15(9):5, 1-20.
 - **DiMattina, C.**, & Zhang, K. (2013). Adaptive stimulus optimization and modelbased experiments for sensory systems neuroscience. *Frontiers in Neural Circuits* 7(101): 1-16.
 - DiMattina, C., Fox, S.A. & Lewicki, M.S. (2012). Detecting natural occlusions using local cues. *Journal of Vision* 12(13):15, 1-21
 - **DiMattina**, C., & Zhang, K. (2011). Active data collection for efficient estimation and comparison of nonlinear neural models. *Neural Computation* 23(9): 2242-2288.
 - **DiMattina, C.**, & Zhang, K. (2010). How to modify a neural network gradually without changing its input-output functionality. *Neural Computation* 22(1):1-47.
 - DiMattina, C., & Zhang, K. (2008). How optimal stimuli for sensory neurons are constrained by network architecture. *Neural Computation* 20(3):668-708.
 - **DiMattina, C.**, & Wang, X. (2006). Virtual vocalization stimuli for investigating neural representations of species-specific vocalizations. *Journal of Neurophysiology* 95(2):1244-1262.
 - Kotak, V.C., DiMattina, C., & Sanes, D.H. (2001). GABA(B) and Trk receptor signalling mediates long-lasting inhibitory synaptic depression. *Journal of Neurophysiogy* 86(1):536-540.
- PRE-PRINTS **DiMattina, C.** (2021). Interactions between luminance steps and luminance textures for boundary segmentation. *bioRxiv.org*
- DISSERTATION **DiMattina, C.** (2009). Neural network analysis of sensory processing and active data collection. Unpublished PhD Thesis. Department of Neuroscience, The Johns Hop-kins University School of Medicine.

CONFERENCE **DiMattina, C.** & Baker, C.L. Jr (2021). Boundary segmentation from luminance and texture cues: Underlying mechanisms. *Vision Sciences Society*, Poster Abstract.

- Pipitone, R.N. & DiMattina, C. (2019). The relationship between visual discomfort and scores on the Trypophobia Questionnaire as a function of trypophobic image phase and amplitude spectral profiles. International Society for Human Ethology. Zadar, Croatia.
- Pipitone, R.N., DiMattina, C., Koroleva, M., Dreier, S., Williams, S. & Solate, P. (2019). Object clusters or energy? Manipulating phase and amplitude spectra to determine visual discomfort in trypophobic images. 31st Human Behavior and Evolution Society. Boston, MA.
- DiMattina, C. & Baker, C.L. Jr. (2018). How texture elements are combined to detect boundaries: A machine learning approach. Vision Sciences Society, Poster Abstract 43.367.
- **DiMattina, C.** (2016). Estimating and comparing models of neural encoding and decoding using psychophysical experiments. *Vision Sciences Society*, Poster Abstract 53.3007.
- **DiMattina, C.** & Zhang, K. (2015). Efficient implementations of the adaptive PSI procedure for estimating multi-dimensional psychometric functions. *Vision Sciences Society*, Poster Abstract 33.4043.
- **DiMattina, C.** & Lewicki, M.S. (2011). Representation of natural occlusion boundaries by human and ideal observers and relationship to natural image statistics. *Society* for Neuroscience, Poster Abstract 799.03.
- Tam, W., Dekel, E. DiMattina, C., Young, E.D. & Zhang, K. (2011). Using optimal experimental design for capturing paramters of neural networks in the inferior colliculus of the common marmosets. *Society for Neuroscience*, Poster Abstract 480.10.
- **DiMattina, C.** & Zhang, K. (2010). Identifiability of nonlinear receptive field models from sensory neurophysiology data. *Frontiers in Neuroscience. Conference Abstract: Computational and Systems Neuroscience.*
- **DiMattina, C.**, Tam, W., Young, E.D., & Zhang, K. (2010). Adaptive design of stimuli for efficient characterization of nonlinear sensory responses. *Collaborative Research in Computational Neuroscience* (PI Meeting), Poster Abstract C15.
- **DiMattina, C.**, & Lewicki, M.S. (2010). Effects of database and fixations on receptive fields learned by a sparse coding model of natural images. *Gordon Research Conferences: Sensory Coding in the Natural Environment*, Bates College, ME.
- DiMattina, C. & Zhang, K. (2009). Active data collection for efficient estimation and comparison of sensory processing models. *Society for Neuroscience*, Poster Abstract 290.13.
- DiMattina, C. & Zhang, K. (2008). Adaptive experimental design for online model comparison. Society for Neuroscience, Poster Abstract 798.15.
- **DiMattina, C.** & Wang, X. (2004). Virtual vocalization stimuli for investigating neural representations of species-specific primate vocalizations. *Society for Neuroscience*, Poster Abstract 650.14.
- DiMattina, C. & Wang, X. (2002). Virtual Vocalization Stimuli for Systematic Investigation of Cortical Coding of Vocal Communication Sounds. Association for Research in Otolaryngology, Poster Abstract 455.

Invited Talks	 Conference Workshops and External Seminars Segmenting luminance-defined texture boundaries. McGill Vision Research Unit. Dec 11th, 2020, Montreal CA (Virtual). Modeling second-order edge perception using psychophysical subunit models. McGill Vision Research Unit. June 16th, 2017. Montreal, CA. Analyzing perception and neural coding using adaptive experiments. COGSCI 2015: Workshop on Optimizing Experimental Designs: Theory, Practice, and Applications. July 22nd, Pasadena, CA. Information theoretic stimulus design for neurophysiology and psychophysics. Organization for Computational Neuroscience workshop on Information Theory in Neuroscience. July 30 2014, Quebec City, CA. 	
Editorial Boards	Associate Editor, 2019-presentFrontiers in Psychology: Perception ScienceFrontiers in Neuroscience: Perception Science	
Referee Service	 Manuscript Review Journal of Neuroscience Journal of Vision Vision Research Neuroimage IEEE Journal of Biomedical and Health Informatics BMC Psychology Behavioral Research Methods PLoS One PLoS Computational Biology Neural Computation Journal of Computational Neuroscience Control and Cybernetics Book Proposal Review Anonymous (2016). "An Introduction to Computational Neuroscience for Non-Specialists." Taylor & Francis. Grant Review National Science Foundation (NSF): Program in Perception, Action and Cognition. 	
PROFESSIONAL	New York University, New York, NY USA	
	Research Computer Programmer Soptember 1999 to September 2000	
	 NYU Center for Neural Science in the laboratory of Daniel H. Sanes, Ph.D. Developed a data acquisition and analysis package in IGOR for brain slice neurophysiology experiments. Software is available at http://www.cns.nyu.edu/ sanes/slice_software/ 	
Computer Experience	Extensive experience in scientific computing, numerical optimization, data analysis and development of scientific data acquisition systems	
	Operating Systems: Mac OS X, MS Windows, Linux, UNIX Programming: C, C++, Java, Python, MATLAB, IGOR, TensorFlow Supercomputing: GPU Computing (NVIDIA) with Tensorflow	

	Web Development: HTML, XHTML, CSS Document Typesetting: ET_EX
Service and Adminstrative	 Florida Gulf Coast University 2014-2017 Department representative to the Whitaker Center for STEM Education 2015-present
	Department representative to the CAS Curriculum Committee
References	Kelly Schuller, Ph.D. Department of Psychology Florida Gulf Coast University kschuller@fgcu.edu
	Kristopher Kimbler, Ph.D. Department of Psychology Florida Gulf Coast University kkimbler@fgcu.edu
	Curtis L. Baker, Ph.D. Department of Ophthalmology & McGill Vision Research McGill University, Quebec CA curtis.lee.baker@mcgill.ca
	Frederick Kingdom, Ph.D. Department of Ophthalmology & McGill Vision Research McGill University, Quebec CA frederick.kingdom@mcgill.ca
	Kechen Zhang, Ph.D. Departments of Biomedical Engineering & Neuroscience The Johns Hopkins University School of Medicine kechen@bme.jhu.edu
	Michael S. Lewicki, Ph.D. Department of Electrical Engineering & Computer Science Case Western Reserve University michael.lewicki@case.edu
	Xiaoqin Wang, Ph.D. Departments of Biomedical Engineering & Neuroscience The Johns Hopkins University School of Medicine xwang@bme.jhu.edu
	Daniel H. Sanes, Ph.D. Center for Neural Science & Department of Biology New York University sanes@cns.nyu.edu
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