Curriculum Vitae
David L. Sheinberg
(Updated May, 2023)

1. ADDRESS

Professor
Department of Neuroscience
Division of Biology and Medicine
Brown University
Providence, RI 02912
http://sheinberglab.org

2. EDUCATION

Yale College, New Haven, CT, 1985-1989, BA Computer Science and Psychology
Brown University, Providence, RI, 1989-1994, PhD Cognitive Science
Dissertation: Peripheral Vision and Spatial Attention During Simulated Driving

3. PROFESSIONAL APPOINTMENTS

Postdoctoral Fellow (1994-1997; Advisor: Nikos K. Logothetis)
Baylor College of Medicine, Houston, TX

Research Scientist (1997-2000)
Max Planck Institute for Biological Cybernetics, Tübingen, Germany

Assistant Professor of Medical Science (2000-2006)
Brown University, Department of Neuroscience
Manning Assistant Professor (2005-2006)
Associate Professor of Neuroscience (2006-2011)
Professor of Neuroscience (2011-present)

4. RESEARCH

a. Chapters in Books

Brooks DI, Sigurdardottir HM, & Sheinberg DL (2014). The neurophysiology of attention and object recognition in visual scenes. In K Kverga & M Bar (eds.) Scene Vision. Cambridge MA: MIT Press, 85-104.

Anderson B, Sheinberg DL (2010). Neurophysiology of Temporal Orienting in the Ventral Visual Stream. In Nobre A, Coull J (Eds.) Attention and Time, Oxford University, Press, pp. 407-417.

Sheinberg DL, Tarr MJ (2010). Objects of Expertise. In I Gauthier, M Tarr and D Bub (Eds.), Perceptual Expertise.

Woloszyn L & Sheinberg DL (2009). Shape representation in inferotemporal cortex. In Larry R. Squire, Editor-in-Chief, Encyclopedia of Neuroscience, Academic Press, Oxford, 777-785.

Anderson JA, Allopenna P, Guralnik GS, Sheinberg DL, Santini, Jr. JA, Dimitriadis S, Machta BB, and Merritt B (in press). Programming a Parallel Computer: The Ersatz Brain Project. In W Duch, J Mandzuik, and JM Zurada (Eds.), Challenges to Computational Intelligence. Springer: Berlin.

Logothetis, N. K., Leopold, D. A., & Sheinberg, D. L. (2003). Neural mechanisms of perceptual organization. In N. Osaka (Ed.) Neural basis of consciousness. Advances in Consciousness Research: Vol. 49 (pp. 87-103). Amsterdam, Netherlands: John Benjamins Publishing Company.

Sheinberg DL, Logothetis NK (2002) Perceptual Learning and the Development of Complex Visual Representations in Temporal Cortical Neurons. In Fahle M, Poggio T, (Eds.) *Perceptual Learning,* Cambridge, MA: MIT Press, 95-124.

Sheinberg DL, Logothetis NK (1996) Recognition and representation of visual objects in primates: Psychophysics and physiology. In Llinas R, Churchland P (Eds.) *The Mind Brain Continuum,* Cambridge, MA: MIT Press, 147-172.

Blake A, Bülthoff HH, Sheinberg DL (1996) Shape from texture: Ideal observers and human psychophysics. In Knill D, Richards W (Eds.) *Perception as Bayesian Inference*, Cambridge, MA: MIT Press, 287-322.

Zelinsky GJ, Sheinberg DL (1996) Saccades reflect differences in visual search efficiency. In Gale AG (Ed.) *Proceedings of the Third International Conference on Visual Search*, London: Taylor and Francis.

Sheinberg DL, Zelinsky GJ (1993) A cortico-collicular model of saccadic target selection. In Rensbergen J, Devijver V, d'Ydewalle G (Eds.) *Perception and Cognition*, Amsterdam, Elsevier Science, 333-348.

b. Refereed Journal Articles

Cavanagh, P., Caplovitz, G. P., Lytchenko, T. K., Maechler, M. R., Tse, P. U., & Sheinberg, D. L. (2023). The Architecture of Object-Based Attention. Psychonomic Bulletin & Review. https://doi.org/10.3758/s13423-023-02281-7

Ahuja, A., Desrochers, T. M., & Sheinberg, D. L. (2022). A role for visual areas in physics simulations. Cognitive Neuropsychology, 1–15. https://doi.org/10.1080/02643294.2022.2034609

Miller, R. L., & Sheinberg, D. L. (2022). Evidence for Independent Processing of Shape by Vision and Touch. Eneuro, 9(3), ENEURO.0502-21.2022. https://doi.org/10.1523/ENEURO.0502-21.2022

Burk, D. C., & Sheinberg, D. L. (2022). Neurons in inferior temporal cortex are sensitive to motion trajectory during degraded object recognition. Cerebral Cortex Communications, 3(3), tgac034. https://doi.org/10.1093/texcom/tgac034

Ashok, A. K., Govindarajan, L. N., Linsley, D., Sheinberg, D., & Serre, T. (2022, January). The emergence of visual simulation in task-optimized recurrent neural networks. In *NeurIPS workshop on Shared Visual Representations in Human & Machine Intelligence*.

Tremblay, S, Acker L, Afraz A, Albaugh D, Amita H, Andrei AR, Sheinberg D, et al. "An Open Resource for Non-Human Primate Optogenetics." (2020) *Neuron* 108, no. 6: 1075-1090.e6. https://doi.org/10.1016/j.neuron.2020.09.027.

Ahuja, A., & Sheinberg, D. L. (2019). Behavioral and oculomotor evidence for visual simulation of object movement. *Journal of Vision*, 19(6), 13. doi:10.1167/19.6.13

Richler JJ, Tomarken AJ, Vickery TJ, Ryan KF, Floyd RJ, Sheinberg DL, Wong ACN, & Gauthier I (2019) Individual Differences in Object Recognition, *Psychological Review*.

Desrochers TM, Burk DC, Badre D, Sheinberg DL (2016) The monitoring and control of task sequences in human and non-human primates. Frontiers in Systems Neuroscience, 9.

Lim S, McKee JL, Woloszyn L, Amit Y, Freedman DJ, Sheinberg DL, Brunel N (2016). Inferring learning rules from distribution of firing rates in cortical neurons, *Nature Neuroscience*.

Dai J, Ozden I, Brooks DI, Wagner F, May T, Agha N, Brush B, Borton D, Nurmikko A, Sheinberg DL (2015). Modified toolbox for optogenetics in the nonhuman primate, Neurophotonics, 2(3).

Xia R, Guan S, & Sheinberg DL (2015). A multilayered story of memory retrieval, Neuron, 86, 610-612 (preview).

Sigurdardottir HM & Sheinberg DL (2015). The effects of short-term and long-term learning on the responses of lateral intraparietal neurons to visually presented objects. J Cog Neuro.

May T, Ozden I, Brush B, Borton D, Wagner F, Agha N, Sheinberg DL, Nurmikko AV (2014) Detection of optogenetic stimulation in somatosensory cortex by nonhuman primates - towards artificial tactile sensation. *PLoS ONE* 9(12): e114529. doi:10. 1371/journal.pone.0114529.

Dai J, Brooks DI, & Sheinberg DL (2014). Optogenetic and electrical stimulation systematically bias visuospatial choice in primates, *Current Biology*, 24, 63-69.

Sigurdardottir HM, Michalak SM, & Sheinberg DL (2014). Shape beyond recognition: Form-derived directionality and its effects on visual attention and motion perception, J Exp Psychol: General, 143(1), 434-454. doi: 10.1037/a0032353.

Mruczek REB & Sheinberg DL (2012). Stimulus selectivity and response latency in putative inhibitory and excitatory neurons of the primate inferior temporal cortex, J Neurophysiol, 108(10), 2725-36.

Woloszyn L & Sheinberg DL (2012). Effects of long-term visual experience on responses of distinct classes of single units in inferior temporal cortex, Neuron, 193-205.

Monosov IE, Sheinberg DL, & Thompson KG (2011). The effects of prefrontal cortex inactivation on object responses of single neurons in the inferotemporal cortex during visual search, J Neurosci, 31, 15956-15961.

Monosov IE, Sheinberg DL, & Thompson KG (2010) Paired neuron recordings in the prefrontal and inferotemporal cortices reveal that spatial selection precedes object identification during visual search, PNAS, 107, 13105-13110.

Singer J & Sheinberg DL (2010) Temporal cortex neurons encode articulated actions as slow sequences of integrated poses, J Neurosci, 30, 3133-3145.

Wong YK, Twedt E, Sheinberg DL, & Gauthier I (2010) Does Thompson's Thatcher Effect reflect a face-specific mechanism?, Perception, 41, 1125-1141.

Woloszyn L & Sheinberg DL (2009). Neural dynamics in inferior temporal cortex during a visual working memory task, J Neurosci, 29, 5494-5507.

Kawasaki K & Sheinberg DL (2008). Learning to recognize visual objects with microstimulation in inferior temporal cortex. J Neurophys. 100, 197-211.

Anderson B, Mruczek REB, Kawasaki K & Sheinberg DL (2008). Effects of familiarity on neural activity in monkey inferior temporal lobe, Cereb Cortex, 18, 2540-2552.

Singer J, Sheinberg DL (2008) A method for the real-time rendering of formless dot field structure-from-motion stimuli, J Vision, 8, 1-8. [PMC3046877]

Scott LS, Tanaka JW, Sheinberg DL & Curran T (2008). The role of category learning in the acquisition and retention of perceptual expertise: A behavioral and neurophysiological study. Brain Research, 19, 204-215.

Anderson B, Sheinberg DL (2008). Effects of temporal context and temporal expectancy on neural activity in inferior temporal cortex. Neuropsychologia, 46, 947-957.

Mruczek REB, Sheinberg DL (2007). Context familiarity enhances target processing by inferior temporal cortex neurons, J Neurosci, 27, 8533-8545.

Peissig JJ, Singer J, Kawasaki K, Sheinberg DL (2007). Effects of long-term object familiarity on event-related potentials in the monkey. Cerebral Cortex, 17, 1323-1334.

Mruczek REB, Sheinberg DL (2007). Activity of inferior temporal cortical neurons predicts recognition choice behavior and recognition time during visual search. J Neurosci, 27, 2825-2836.

Anderson B, Sanderson MI, Sheinberg DL (2007). Joint decoding of visual stimuli by IT neurons' spike counts is not improved by simultaneous recording. Exp Brain Res, 176, 1-11.

Sheinberg DL, Peissig JJ, Kawasaki K, Mruczek REB (2006). Initial saccades predict manual recognition choices in the monkey. Vision Res, 46, 3812-3822.

Scott LS, Tanaka JW, Sheinberg DL, Curran T (2006). A reevaluation of the electrophysiological correlates of expert object processing, J Cog Neurosci, 18, 1453-1465.

Anderson B, Harrison MT & Sheinberg DL (2006). A Multielectrode Study of IT in the Monkey: Effects of Grouping on Spike Rates and Synchrony, NeuroReport, 17, 407-411.

Anderson B, Peissig JJ, Singer J & Sheinberg DL (2006). XOR style tasks for testing visual object processing in monkeys. Vision Research, 46, 1804-1815.

Singer J & Sheinberg DL (2006). Holistic processing unites face parts across time. Vision Research, 46, 1838-1847.

Amarasingham A, Chen TL, Geman S, Harrison MT & Sheinberg DL (2006). Spike count reliability and the Poisson hypothesis. Journal of Neuroscience, 26, 801-809.

Mruczek REB & Sheinberg DL (2005). Distractor familiarity leads to more efficient search for complex stimuli. Perception and Psychophysics, 67, 1016–1031.

Tanaka J, Curran T, Sheinberg DL (2005). The training and transfer of real-world, perceptual expertise. Psychological Science, 16, 145-151.

Tse PU, Sheinberg, DL, Logothetis NK (2004). The distribution of microsaccade directions need not reveal the location of attention. Psychological Science, 15, 708-710.

Tse PU, Sheinberg DL, Logothetis NK (2003) Attentional enhancement opposite a peripheral flash revealed by change blindness. Psychological Science, 14, 91-99.

Tse PU, Sheinberg DL, Logothetis NK (2002) Fixational eye movements are not affected by abrupt onsets in the periphery. Vision Research, 42, 1663-1669.

Sheinberg DL, Logothetis NK (2001) Noticing familiar objects in real world scenes: The role of temporal cortical neurons in natural vision, Journal of Neuroscience, 21, 1340-1350.

Sheinberg DL, Logothetis NK (1997) The role of temporal cortical areas in perceptual organization, Proceedings of the National Academy of Sciences, 94, 3408-3413.

[Reprinted in: Yantis, Steven (Ed) (2000) Visual perception: Essential readings. Key readings in cognition. (pp. 393-401). Philadelphia, PA, US: Psychology Press/Taylor & Francis.]

Zelinsky GJ, Sheinberg, DL (1997) Eye movements during parallel/serial visual search, Journal of Experimental Psychology [Human Perception and Performance], 25, 244-262.

Logothetis NK, Sheinberg DL (1996) Visual object recognition. Annual Review of Neuroscience, 19, 577-621.

Logothetis NK, Leopold DA, Sheinberg DL (1996) What is rivalling during binocular rivalry? Nature, 380, 621-624.

Blake A, Bulthoff, HH, Sheinberg, DL (1993) Shape from texture: Ideal observers and human psychophysics. Vision Research, 33, 1723-1737.

c. Conference Proceedings

Sheinberg, D. (2003). The most reliable period for temporal cortical neurons. Journal of Vision, 3(9), 154a, http://journalofvision.org/3/9/154/, doi:10.1167/3.9.154.

Logothetis NK, Leopold DA, Sheinberg DL (1997) The neurophysiological basis of bistable percepts. In Y. Miyashita, T. Ihui, M. Kawato, K. Tanaka, and J Murata (Eds.) *Proceedings of the IIIA*. Kyoto.

d. Work in Progress or Under Review

Dang W, Sheinberg DL (in preparation). Coding of highly familiar faces by single cells in primate temporal cortex.

Guan S, Xia R, Sheinberg DL (in preparation). Neural evidence for recurrent activity in IT cortex.

e. Abstracts (2006-2023, selected from > 90 since 1996)

Miller RL, Sheinberg DL (2018) Visual-haptic interactions influence shape recognition, Society for Neuroscience Meeting.

Burk D, Sheinberg DL (2018) Movement improves shape discrimination under visual uncertainty, Society for Neuroscience Meeting.

Dang, W, Sheinberg (2018) Effect of familiarity on neural dynamics of face selective cells in monkey inferior temporal cortex during a demanding face discrimination task, Society for Neuroscience Meeting.

Ahuja A, Sheinberg DL (2018) Eye Movements Indicate Implementation of Mental Simulation to Assess Future Object Movement, VSS Annual Meeting.

Xia R, Guan S, Sheinberg DL (2017) Dynamic lateral interactions in monkey area V4, Society for Neuroscience Meeting.

Guan S, Xia R, Sheinberg DL (2017) Bidirectional visual processing: Distinct dynamics and interactions between V4 and inferior temporal cortex in challenging scenarios, Society for Neuroscience Meeting.

Guan S, Xia R, Sheinberg DL (2016). Assessing the Role of Correlated Noise using Gaussian Copula Models, Cosyne 2016.

Lim S, McKee JL, Woloszyn L, Amit Y, Freedman DJ, Sheinberg DL, Brunel N (2015). Inferring learning rules from distributions of firing rates in inferior temporal cortex. Cosyne 2015.

Dai J & Sheinberg DL (2014). Modulation of spatial working memory by optogenetic stimulation in the nonhuman primate. Society for Neuroscience Abstracts.

Dai J, Brooks DI, Sheinberg DL (2013). Establishing a standard protocol for effective integration of optogenetic methods in awake behaving non-human primate experiments. Society for Neuroscience Abstracts.

Dai J, Brooks DI, Sheinberg DL (2012). Modulation of attention by optogenetic stimulation in the non-human primate. Society for Neuroscience Abstracts.

Brooks DI, Dai J, Sheinberg DL (2012). The contribution of Area LIP to naturalistic visual search. Society for Neuroscience Abstracts.

Brooks D, Sheinberg DL (2011) Scene-based contextual cueing in the rhesus macaque, Vision Sciences Society.

Woloszyn L, Sheinberg DL (2011) Effects of long-term visual experience on single neuron responses in the inferior temporal cortex, Societ7y for Neuroscience Abstracts.

Ozden I, Wang J, Borton DA, Wagner FBP, Brush BRM, Agha NS, Brooks DI, Dai J, Diagnes M, Sheinberg DL, Nurmikko AV (2011) A versatile tool for optogenetic neuromodulation in non-human primates: The single coaxial optrode, Society for Neuroscience Abstracts.

Lebrecht S, Bar M, Sheinberg DL, Tarr MJ (2011) Micro-Valence: Nominally neutral visual objects have affective valence, Vision Sciences Society.

Tan C, Yorgan V, Serre T, Sheinberg DL, Poggio T (2010) Do Dorsal Stream Neurons Encode Combinations of Local Motion Direction? Society for Neuroscience Abstracts, 731.11.

Sigurdardottir HM, Sheinberg DL (2010) The Functional Role of LIP Shape Selectivity, Society for Neuroscience Abstracts, 75.9.

Tan C, Singer J, Serre T, Sheinberg DL, Poggio T (2010) How STS Recognizes Actions: Predicting Single-Neuron Responses In Higher Visual Cortex, Vision Sciences Society.

Sigurdardottir H-M, Sheinberg DL (2010) Origins of Shape Selectivity in the Lateral Intraparietal Area (LIP), Vision Sciences Society.

Tan C, Juang H, Singer J, Serre T, Sheinberg DL, Poggio T (2009) Computational mechanisms for the recognition of time sequences of images in the visual cortex, Society for Neuroscience Abstracts.

Monosov IE, Sheinberg DL, Xu P, Thompson KG (2009) Where before what: Simultaneous recordings in FEF and IT reveal neural mechanisms of object perception in complex visual scenes, Society for Neuroscience Abstracts.

Woloszyn L, Sheinberg DL (2008) Characterizing neural activity in inferior temporal cortex during an occlusion-based visual working memory task, Society for Neuroscience Abstracts.

Singer J, Sheinberg DL (2008) Learning and recognizing time sequences of images in the visual cortex I: Neurophysiological results, Society for Neuroscience Abstracts.

D'Lauro C, Scott LS, Sheinberg DL, Tanaka JW, Curran,T (2008) Spaced learning promotes robust perceptual expertise, Society for Neuroscience Abstracts.

Mruczek R, Sheinberg DL (2008) Functional properties of putative inhibitory and excitatory neurons in primate inferior temporal cortex, Society for Neuroscience Abstracts.

Woloszyn L, Sheinberg DL (2007) Candidate neural substrates of visual object working memory, Society for Neuroscience Abstracts.

Singer J, Sheinberg DL (2007) Dorsal and ventral contributions to action selectivity in temporal cortex neurons, Society for Neuroscience Abstracts.

Singer J, Sheinberg DL (2007) Joint object and motion selectivity in the temporal cortex, Vision Sciences Society.

Twedt E, Sheinberg DL, Gauthier I (2007) Comparing Thomson's Thatcher effect with faces and non-face objects, Vision Sciences Society.

Sheinberg DL, Anderson B (2006) Now you see it, now you don't: behavioral and physiological effects of temporal cueing in the monkey, Society for Neuroscience Abstracts.

Mruczek REB, Sheinberg DL (2006) Effects of experience on receptive field size in monkey inferior temporal cortex, Society for Neuroscience Abstracts.

Scott L, Tanaka J, Sheinberg DL, Curran T (2006) The contributions of category experience and learning to perceptual expertise: A behavioral and neurophysiological study, Vision Sciences Society.

Mruczek REB, Sheinberg DL (2006) Recognition choice behavior is predicted by activity in inferior temporal cortex, Vision Sciences Society.

Anderson B, Harrison M, Sheinberg DL (2006) Neuronal Synchrony and Visual Grouping: A Multi-electrode Study in Monkey IT, Vision Sciences Society.

Woloszyn L, Sheinberg DL (2006) No Lateral-Vertical Asymmetry in the Processing of Mirror Images in the Monkey, Vision Sciences Society.

Kawasaki K, Sheinberg DL (2006) Temporal integration of visually and electrically evoked activity in monkey inferior temporal cortex during visual discrimination learning, Vision Sciences Society.

Sheinberg DL, Mruczek REB, Anderson B, Kawasaki K (2006) Effects of Long Term Image Familiarity in Monkey Temporal Cortex, Vision Sciences Society.

f. Invited Lectures

Special Symposia

"High level vision: Seeing beyond the image", 2018 Farewell Symposium For Heinrich Bülthoff, Tuebingen Germany (August 2018).

"Control of visual processing through optogenetic and electrical stimulation in the non-human primate". Japanese Neuroscience Society (July 2016).

"Plasticity of Visual Representations in Extrastriate Cortex". Gordon Research Conference, Sunday River Resort, Newry, ME (July, 2014).

"How to recognize a chair". Invited guest to honor Marlene Behrmann, incoming co-director of the Center for the Neural Basis of Cognition (March, 2014).

Shapes, objects, and predicting the future. Keynote Speaker, 17th Annual Center for the Neural Basis of Cognition Retreat, Seven Springs, PA (October, 2013, rescheduled for March 2014).

Effects of visual experience on temporal cortical activity. International Conference on Computation & Neural Systems, Boston University (May, 2011).

Learning to see in a complex world, The Picower Institute Symposium, MIT, Cambridge (October 2010)

Time scales and recognition dynamics: Physiology and behavior, Keynote Lecture, Temporal Dynamics of Learning Center All-Hands Meeting, San Diego (Jan 2010).

How we know what's out there: The role of temporal cortex in recognition. Plenary speaker, Waterloo Brain Day, Center for Theoretical Neuroscience, University of Waterloo (April, 2009).

Dynamic activity in temporal cortex. Dynamic Perception, Communication and Action Workshop, Hebrew University, Israel Science Foundation. (May 2008)

Dynamic processing of visual form in primate temporal cortex. Lake Ontario Visionary Establishment, Niagara Falls, Canada (Feb 2007).

Dynamic processing of visual form in primate temporal cortex. RIKEN Brain Science Institute Program, Japan (July 2006).

From seeing to knowing: The role of inferotemporal cortex in vision. International Conference on Computation & Neural Systems, Boston University (May, 2005).

Neural correlates of perception, recognition, and beyond in the non-human primate. Harvard Mind/Brain/Behavior Initiative (April, 2005).

"Face" cells and "non-face" cells in IT cortex, Tuebinger Wahrnehmungskonferenz, (Feb, 1999).

Invited Seminars

Effects of experience and attention on visual processing, Dartmouth College, (June 2016).

Visual Processing in Body Dysmorphic Disorder: A Collaborative Approach, Chairs Lunch, Butler Hospital (September, 2013).

Efficient visual processing and the effects of experience, University of Chicago (April, 2012).

The Unity of Consciousness and Sensory integration: Insights from neuroscience, Brown University (Nov, 2011).

Recognizing dynamic form: Modeling and physiology, Collaborative Research Computation Neuroscience Meeting, Johns Hopkins University, Baltimore (June, 2010)

Dynamic processing of visual form in the temporal lobe. Yale Neurobiology Colloquium, New Haven (April 2008)

Action recognition in the primate brain. MIT Center Biological & Computational Learning, Cambridge (Feb 2008)

Recognizing and representing action: Dynamic integration of movement or form? NSF All Hands, Vanderbilt University, Nashville (Jan 2008)

Neurophysiological and behavioral effects of familiarity on visual search. Scene Understanding Symposium, MIT (Feb 2007).

Neural dynamics and visual recognition. Temporal Dynamics of Learning Center Kick-off, Salk Institute (Jan 2007).

Exploring the neural dynamics of visual recognition, MGH (March, 2006).

Perception to action through temporal cortex. Harvard Vision Group (Feb 2006).

How do you create an expert? Invited Symposium at the Cognitive Neuroscience Society Annual Meeting , NYC (March 2003).

Seeing, knowing, and knowing what you're seeing, MIT Brain and Cognitive Sciences (Dec 2004).

Learning to see a complex world, Harvard University, Dept. of Psychology (March 2004).

Learning to see a complex world: Evidence from physiology and psychophysics: Queens's University, Kingston, Ontario (March 2003).

Cosmic Issues. Koffler Bornstein Families Institute of Jewish Studies, Temple Emanu-El, Providence (March 2003).

Learning to see a complex world: Evidence from physiology and psychophysics: Princeton Plasma Physics Lab, Princeton, NJ (March 2003).

Psychophysics and neurophysiology of natural scene perception in the monkey, Gordon Conference (July 2002).

How the brain sees a complex world, Annual Meeting of the James S McDonnell Foundation, Tarrytown, NY (June 2002).

Probing the neural basis of visual recognition, Brain Science Program Annual Retreat, Burlington, VT (Mar 2002).

The machine inside, Brown University Inauguration Ceremony (Oct 2001).

From perception to action: The role of temporal cortical neurons in noticing visual stimuli, University of Rochester (Mar 2001).

From perception to action: The role of temporal cortical neurons in noticing visual stimuli, Fondation des Treilles, France (Aug 2000).

The role of inferotemporal neurons in perceptual organization, University of Marburg (Dec 1998).

How the brain sees of complex world, Kolloquium der Neurowissenschaften, Tübingen, Germany (Oct 1998).

Neural correlates of visual perception, 14th Annual Houston Conference of Biomedical Engineering Research (Feb 1996).

RESEARCH IN PROGRESS

My research aims to better understand how the concerted activity of single neurons empowers the primate visual system to explore complex environments and recognize complex objects, and on understanding how experience affects these processes. Our approach involves training non-human primates to carry out visual

motor tasks involving complex visual patterns. Current studies are aimed at understanding the role that visual neurons in the temporal lobe play in natural vision and to uncover how the dynamic physiological properties of these cells. Together, these aims capture what I believe to be the fundamental purpose of the visual areas of the temporal lobe - to form a bridge between perception and action by adapting to novel visual environments and providing fast and flexible visual interpretations of the complex world.

Dynamic activity in temporal cortex

Sensory processing is a continuous process and yet our subjective experience appears stable. In this project we are investigating how objects are represented over time by cells in the inferior temporal cortex and how this activity is modulated by attention and correlated with perception, awareness, and recognition. Of special interest is how neural representations change over time as a function of experience.

The neural basis of mental simulation

How do we imagine events that have never happened? We study this process by creating novel environments that observers can use to internally simulate outcomes before they occur. Using a combination of behavioral, computational, and neural recording methods, we are exploring how the brain can support imagination in humans and monkeys.

Shape processing by touch and vision

The goal of this research is to better understand how objects are represented at a supramodal level. To this end, we are exploring how shapes can be recognized by touch and sight using novel approaches for presenting haptic shapes and visual shapes in a unified behavioral paradigm. We are testing the hypothesis that all shape recognition leverages visual areas, even when information is obtained by touch.

Perception of animate form

Investigate the mechanisms by which visual signals related to motion and form are combined to allow monkeys to recognize and respond to animate objects.

5. RESEARCH GRANTS

Active grants:

NIH-R21EY032713 Toward an animal model of visual simulation, May 2021-Feb 2024.

NIH-R21NS130475 Recognition of shape by vision and touch, Sept 2022-August 2024.

NIH-NIMH R03MH123990 Closing the loop on markerless object tracking July 2020-June 2023 (PI)

NIH-NIMH T32MH020068-13 Interdisciplinary Predoctoral Neuroscience Training Program July 2021 – June 2025 (Co-PI).

NIH-NIGMS 5 P20 GM103645 07 6152, Behavior and Neuroimaging Core, Aug 2018-Aug 2024 (Core Director)

Completed grants:

ONR Bidirectional vision (Co-PI, Lead PI: R O'Reilly, ONR N000014-14-0670). May 2014-Mar 2020.

Dynamic visual activity in temporal cortex, April 2004 - June 2018 (NCE). National Institutes of Health (PI: Sheinberg, RO1-EY014681).

NIH NINDS 1U01NS090557 (NIH BRAIN Initiative)," Large-scale Electrophysiological Recording and Optogenetic Control System" (PIs: Goodell, Gray, Sheinberg, Pesaran)

NSF Science of Learning Center "Temporal Learning Center", Oct 2006-Oct 2018, (Senior Investigator; PI: Gary Cottrell, UCSD, SBE-0542013).

DARPA Brain Reorganization and Plasticity to Accelerate Injury Recovery: Multi-Scale and Multi-Modal models Enabled by: Next Generation Neurotechnology (PI: Shenoy, N66001-10-C-2010). April 2010-March 2013.

Norman Prince Neuroscience Institute and Brown Institute for Brain Science Seed Grant, "Visual Processing in Body Dysmorphic Disorder" (PIs: Sheinberg and Phillips).

Brown DEANS Award, "Modification of Perception in Body Dysmorphic Disorder and Neural Correlates" (PIs: Sheinberg and Phillips)

DARPA Neovision II Neuromorphic visual system for intelligent unmanned sensors. (Co-PI, Lead PI: Laurent Itti, BAA-09-58). Jan 2010-Dec 2011.

Collaborative Proposal: Object and Action Recognition in Time Sequences of Images: Computational Neuroscience and Neurophysiology, Sep 2008-Aug 2011, NSF (PI: Sheinberg, IIS #0827427).

Expertise in object perception (Perceptual Expertise Network) Jan 2001-Dec 2010, Subcontract for $420,000 direct, (Co-PI, I Gauthier PI) JSMF Collaborative Activity Award.

Compositional representation in the visual system (Co-PI, S Geman PI), Sept 2004-Aug 2007, (CRCNS, NSF).

Perception of animate form: Probing the neural basis of cognition, Dec 2001-Nov 2007, (#20002043, PI: Sheinberg) James S McDonnell Foundation

Phase II SBIR, "Ersatz Brain Project", March 2006-June 2008 (Co-PI, J Anderson PI) Air Force Research Laboratory (Rome, NY, Advanced Computer Architecture).

Enrichment and Integration of Networked Computing and Visualization Resources for the Mathematical Sciences (Co-PI, D McClure PI), Sept 2004-Aug 2006, (DMS Infrastructure Program, NSF). $93,000 direct.

Effects of microstimulation in the inferotemporal cortex of monkeys, Aug 2000-March 2004, McDonnell Pew Program in Cognitive Neuroscience

Sloan Research Fellowship, Sept 2001-Aug 2003

Plasticity of neural representations in the inferotemporal cortex of monkeys, Feb 2001-Jan 2002, Rhode Island Foundation

Potentiation of single neuron responses in inferotemporal cortex, Salomon Faculty Research Award, 2001-2002, Brown University

6. SERVICE

a. To the University

Brown IACUC (2007-present, Vice-Chair, current Interim-Chair)
University Resources Committee (2008-2010, Faculty Vice-Chair 2009-2010)
Health Careers Advisory Committee (Chair: Andrew Simmons; 2006-2011)
Faculty Animal Users Committee (Chair: Ed Hawrot; 2007-)
Brown-Tuebingen Collaborative Research Liaison (2009-present)
Diversity Advisory Board (Faculty Vice Chair; 2004-2008)
Applied Sciences Building Strategic Planning Committee (2010-present)
Brown University Community Council (Chair: Ruth Simmons; 2005-2009)
BioMed MD/PhD Admissions Committee (2006-2008)
BioMed Dean of Research Advisory Board and Search Committee (2005-2006)

Search Committee, Associate Vet (2012, 2014, 2017)

Neuroscience Graduate Student Program DGS (2010-2017, 2019-2023)
Neuroscience Graduate Student Program, Steering Committee (2005-2006)
Neuroscience Graduate Student Program Admissions Committee (2008-present)
Neuroscience Graduate Student Program Seminar Committee (2000-2007)
Search Committee Chair, Computational Neuroscience (2012)

Brain Sciences Graduate Program (Director, 2006-)
Brain Sciences Program Executive Committee (2006-)
Co-Organizer, Computation in Mind and Brain Initiative (2013-present)

Neuroscience Undergraduate Concentration, Director (2004-2008)
Neuroscience Undergraduate Curriculum Committee (2002-2008)
Neuroscience Concentration Advisor (2000-present)
Neuroscience Department Space Committee (2010-present)
Neuroscience Teaching Committee (2011-present)
Freshman Advisor / TEAM Advisor (2001, 2002, 2007, 2009-present)
Sophomore Advisor (2002, 2008-present)

Cognitive and Linguistic Sciences Cog Neuro Search Committee (2003-2004)
Royce Fellowship Program Moderator (Feb 2002)
Member, Mind Brain & Behavior Curriculum Planning Committee (2001)
"The Language of the Brain", Presentation to the Brown Corporation (Oct 2001)
Interdepartmental Advisory Committee for the Psychology Dept

b. To the Profession

Society for Neuroscience, Ethics Committee (2013-present)
Society for Neuroscience, Committee on Animals in Research (2009-2011)
Society for Neuroscience, Prize Committee (2010-present)
Vision Sciences Society Abstract Review Committee (2007-present)
Grant Reviewer, National Science Foundation, The Wellcome Trust/ DBT India Alliance, Center for Complexity Science

Ad Hoc reviewer, *Nature, Nature Neuroscience, Neuron, J Neurosci, Cerebral Cortex, Current Biology, Frontier in Neuroscience, PLoS, Perception & Psychophysics, J Neurophys, TICS, PNAS, Vision Research, J Exp Psychol*

7. ACADEMIC HONORS

1993 - 1996 NSF Predoctoral Scholar
1996 - 1999 Kirchstein NRSA Postdoc Award
2000 - 2001 Salomon Faculty Research Award, Brown University
2001 - 2003 Sloan Fellow
2005 - 2006 Manning Assistant Professor

8. TEACHING / MENTORING

Computation Methods in Neuroscience (NEUR2060, Spring 2018/2019/2020) – Graduate core course exploring key concepts in computational neuroscience.

Coursera MOOC – Exploring Neural Data (Sept 2014, enrollment > 20,000, co-instructor: Linden) – Teach "learners" from around the world basic programming skills necessary for exploring, analyzing, visualizing real neural data.

Exploring Neural Data (NEUR1520, Spring 2014, co-instructor: Linden) – Teach undergraduates basic programming skills necessary for exploring, analyzing, visualizing real neural data.

Advanced Systems Neuroscience (NEUR2050, Fall 2012, 2013,2014) – Graduate core course exploring fundamental concepts in neural systems.

Advanced Cognitive Neuroscience (NEUR2060, Spring 2013) – Graduate core course exploring key concepts in computational neuroscience.

Cerebral Localization (NEUR1940, Spring 2007, Spring 2010) – Senior seminar exploring the historical and current understanding of localized brain function

Systems Neuroscience (NEUR1030) - Lecture course (100-150 students) examining key principles that underlie the function of neural systems ranging in complexity from peripheral receptors to central mechanisms of behavioral control.

The Neural Representation of Objects (NEUR2940) - Reading course exploring the question of how the brain represents objects and the nature of neural codes that may be used for such representations.

Cognitive Neuroscience (NEUR1940) - Seminar course discussing aspects of brain function from two different, but complementary, perspectives: neurological case study and basic neuroscientific experimentation.

Foundations of Neuroscience (Pfizer/Brown Course, NEUR1500) – Introduction to fundamentals of neuroscience taught to Pfizer employees interested in neuroscience (co-taught with M. Paradiso, D. Lipscombe)

Guest Lectures - Introduction to Neuroscience (NEUR0010), Medical Neurobiology (BN260), Cognitive Neuroscience (BN166), Graduate Systems & Cognitive Neuroscience (NEUR2050, NEUR2060)

PhD Students

Past

- Britt Anderson, MD. PhD, Brain Science Program. (2005)
  Title: "Changes in Neuron Firing Rates and Synchronies as A Concomitant of Visual Grouping. A Multi-Electrode Study in the Awake Monkey"
  Current Position: Professor of Psychology, U Waterloo
- Ryan Mruczek (Neuroscience Graduate Program, 2001-2007)
  Title: "Neural Correlates of Efficient Visual Search"
  Current Position: Assistant Professor, College of the Holy Cross
- Jedediah Singer (Brain Science Program, 2002-2008)
  Title: "Vision over time: Temporal integration in the temporal lobe"
  Current Position: Research Scientist, Two Six Labs
- Ilya Monosov (co-advisor, enrolled NIH-Graduate Partnership Program, 2005-2009)
  Title: "Primate frontal eye fields mediate spatial attention in covert visual search"
  Current Position: Associate Professor, Wash U
- Luke Woloszyn (Neuroscience Graduate Program, 2004-2011)
  Title: "Perception, Visual Memory and Inferior Temporal Cortex"
  Current Position: Sr Data Scientist, Foursquare
- Sophie Lebrecht (Cognitive Science Program, 2005-2011)
  Title: "'Micro-valences': Affective valence in 'neutral' everyday objects"
  Current Position: Operations manager, xnor.ai (Apple)
- Heida Maria Sigurdardottir (NSGP 2007-2013)
  Title: "Objects in Space"
  Current Position: Assistant Professor, University of Iceland
- Shaobo Guan
  Title: Vision Beyond the Feedforward Sweep
  Current Position: AI Research Lab, Apple Computer

- Ruobing Xia
  Title: The neural dynamics of feature-based attention
  Current Position: Postdoc, Moore Lab, Stanford
- Diane Burk
  Title: The processing of shape motion associations in inferior temporal cortex
  Current Position: Postdoc, Averbeck Lab, NIH

Current

Aarit Ahuja (4th year)

Postdoctoral Fellows

Jessie Peissig (2002-2004, currently Asst Prof, Cal State Fullerton)
Keisuke Kawasaki (2002-2009, currently Asst Prof, Niigata U, Japan)
Mark Sanderson (2003-2004, currently working for CIGNA)
Britt Anderson (2006-2008, currently Asst Prof, U Waterloo, Canada)
Daniel Brooks (2010-2014)
Ji Dai (2010-2015)
Wenhao Dang (2016-2019)
Ryan Miller (2017-present)

PhD Committees, 2001-present

Graduated NSGP

Mijail Serruya (Advisor: Donoghue, chair, 2000-2001)
Sean MacEvoy (Advisor: Paradiso, 2001-2004)
Cathy Clarke (Advisor: Paradiso, 2002-2005)
Matthew Fellows (Advisor: Donoghue, chair, 2001-2005)
Kara Agster (Advisor: Burwell, 2004-2007)
Ethan Bromberg-Martin (NIH/GPP, Advisor: Hikosaka, 2006-2009)
Carlos Irwin-Vargas (Advisor: Donoghue, chair, 2006-2010)
Benjamin Philip (Advisor: Donoghue, 2006-2009)
Arjun Bansal (Advisor: Donoghue, 2007-2010)
Naveen Rao (Advisor: Donoghue, 2008-2011)
Kristin Kerr (Advisor: Burwell, 2006-2013)
Justine Allen NSGP/MBL (Advisor: Hanlon, 2009-2014)
Jennifer Barredo NSGP (Advisor: Badre, 2008-2014)
Kaivon Paroo NSGP (Advisor: Donoghue, 2007-2014)

Jackie Hynes NSGP (Advisor: Paradiso, 2013-2018)
James Niemeyer NSGP (Advisor: Paradiso, 2009-present)
Michelle Fogerson NSGP (Advisor: Berson, 2010-present)
Lach Franquemont NSGP (Advisor: Donoghue, 2011-present)
Dan Felch NSGP (Advisor: Carlos Aizenman)
Adrian Bondy NIH-GPP (Advisor: Cumming, 2011-present)
Patti Shih NSGP (Advisor: Badre, 2012-present)
Catherine Hegarty GPP (Advisor: Karen Berman, 2013-present)
Dani Rubinstein GPP (Advisor: Karen Berman, 2013-present)
Adam Nitenson NSGP (Advisor: Tara White, 2013-present)
Erica Grodin GPP (Advisor: Markus Heilig, 2014-present)

Graduated Outside of Neuroscience

Chun-Chia Kung (Cognitive Science, Advisor: M Tarr, 2005-2008)
Jean Vettel (Cognitive Science, Advisor: M Tarr, 2006-2009)
Adrian Nestor (CLPS, Advisor: M Tarr, 2006-2009)
Daniel Leeds (CNBC, CMU, Advisor: Tarr, 2010-2013)
Ali Arslan CLPS (Advisor: Serre, 2010-present)
Thomas Wiecki CLPS (Advisor: Frank, 2010-present)
Imri Sofer CLPS (Advisor: Serre, 2011-present)

Current

Julia Zaltsman NSGP (Advisors: Connors & Burwell, 2017-present)
Alexis Toliver NSGP (Advisor: Judy Liu, 2016-present)
Julia Licholai GPP (Advisor: Ryba, 2018-present)
Aneri Soni NSGP (Advisors: Michael Frank & Thomas Serre, 2018-present)
Abdullah Rashed Ahmed (Advisors: Frank & Serre, 2018-present)

Undergraduate Research Advisor (2002-present)

Barbara Schreck, Blake Gurfein, Zeynep Saygin, Justin Bachorik, Zach Gordon, Michael Hadley, Jacob Donoghue, Minal Bhojani, Sergey Stavisky, Jung Kang, Sara Sunshine, Lauren Krumeich, Andrew Kim, Suzanne Michalak, Michelle Schnayder, Luc Amdahl, Stacey Bjorgaard, Jordan Shaw, Sam Johnson, Maria Rodriguez, Yee Won Kim, Anisha Kasi, Brett Starr, Emmajane Rhodenhauser