

1. Name, position, academic departments

Thomas Serre
Manning Assistant Professor
Cognitive, Linguistic & Psychological Sciences Department

2. Home address

68 Great Rd
East Greenwich, RI 02818

3. Education: undergraduate and graduate degrees

- 2001 – 2006 **PhD in Computational Neuroscience**
Mass. Institute of Technology, Department of Brain and Cognitive Sciences
Thesis title: Learning a dictionary of shape-components in visual cortex: Comparison with neurons, humans and machines
Advisor: Prof. Tomaso Poggio
- 1999 – 2000 **MS in Statistics and Probability Theory**
Université de Rennes, France
Major in statistics and probability theory
- 1997 – 2000 **MS in EECS**
Ecole Nationale Supérieure des Télécommunications de Bretagne, France
Major in image processing
- 1995 – 1997 **BS in Math and Physics** (Classes préparatoires aux Grandes Ecoles)
Lycée Pasteur, France
Major in math and physics

4. Professional appointments

- 2013 – present **Manning Assistant Professor**
Brown University, Department of Cognitive and Linguistic Sciences
- 2011 – present **Associate Director**
Brown Behavioral Core Facility
- 2010 – present **Trainer in the Neuroscience Graduate Program**
Brown University, Neuroscience Department
- 2010 – 2013 **Assistant Professor**
Brown University, Department of Cognitive and Linguistic Sciences
- 2006 – 2009 **Postdoctoral Associate**
Mass. Institute of Technology, McGovern Institute for Brain Research

5. Completed Publications

a. Books/monographs

NA

b. Chapters in books

- D. Mely & T. Serre. Towards a system-level theory of computation in the visual cortex. In: *Computational and Cognitive Neuroscience of Vision*, 2015
- T. Serre & M. Giese. Elements for a neural theory of the processing of dynamic faces. In: *Dynamic Faces: Insights from Experiments and Computation*. Edited by Cristóbal Curio, Heinrich H. Bülthoff and Martin A. Giese. MIT Press, 2010
- B. Heisele, T. Serre, S. Prentice and T. Poggio. Hierarchical classification and feature reduction for fast face detection with support vector machines. In: *Handbook of Pattern Recognition and Computer Vision*, third edition, 2005

c. Refereed journal articles

- T. Serre. Models of visual categorization. *WIREs Cognitive Science* (to appear)
- D. Mely, J.K. Kim, M. McGill, Y. Guo & T. Serre. On the diagnosticity of early visual cues for boundary detection in natural scenes. *Vision Research* (to appear)
- H. Kuehne & T. Serre. An end-to-end generative framework for video segmentation and recognition. *IEEE Winter conference on Applications of Computer Vision*, 2016
- M. Cauchoix*, S. Crouzet*, D. Fize & T. Serre. Fast ventral stream neural activity enables rapid categorization. *NeuroImage*, Volume 125, 280-290, 2016.
- S.M. Parker & T. Serre. Unsupervised invariance learning of transformation sequences in a model of object recognition yields selectivity for non-accidental properties. *Frontiers in Computational Neuroscience*, Special Issue on Integrating computational and neural findings in visual object perception, 2015
- I. Sofer, S. Crouzet & T. Serre. Explaining the timing of natural scene understanding with a computational model of perceptual categorization. *PLOS Computational Biology*, 2015
- J.W. Hofmann, X. Zhao, M. De Cecco, A.L. Peterson, L. Pagliaroli, J. Manivannan, G.B. Hubbard, Y. Ikeno, Y. Zhang, B. Feng, X. Li, T. Serre, W. Qi, H. Van Remmen, R.A. Miller, K.G. Bath, R. de Cabo, H. Xu, N. Neretti & J.M. Sedivy. Reduced expression of MYC increases longevity and enhances healthspan. *Cell*, 160, 477–488, 2015
- Y. Zhang, S. Zhang, Q. Huang & T. Serre. Learning sparse prototypes for crowd perception via ensemble coding mechanisms. In: *Proc. 5th International Workshop on Human Behavior Understanding*, 2014
- H. Kuehne, A. Arslan & T. Serre. The language of actions: Recovering the syntax and semantics of goal-directed human activities. In: *Proceedings of 2014 IEEE Computer Society Conference on Computer Vision and Pattern Recognition (CVPR 2014)*, IEEE Computer Society Press, Columbus, Ohio, 2014
- T. Serre. Hierarchical models of the visual system. *Encyclopedia of Computational Neuroscience*, 2014
- D. Reichert & T. Serre. Neuronal synchrony in complex-valued deep networks. *International Conference on Learning Representations*, 2014
- M. Cauchoix, G. Barragan-Jason, T. Serre* & E.J. Barbeau*. The neural dynamics of face detection in the wild revealed by MVPA. *J. Neurosci*, 34(3), 856-854, 2014
- C. Tan, J. Singer, T. Serre, D. Sheinberg & T. Poggio. Neural representation of action sequences: How far can a simple snippet-matching model take us? In *Proc. Neural Information Processing Systems*, 2014
- T. Poggio & T. Serre. Models of the visual cortex. *Scholarpedia*, 8(4):3516, 2013
- M.P. Leussis, E.M. Berry-Scott, M. Saito, H. Jhuang, G. de Haan, O. Alkan, C.J. Luce, J.M. Madison, P. Sklar, T. Serre, D.E. Root & T.L. Petryshen. The ankyrin 3 (ANK3) bipolar disorder gene regulates mood-related behaviors that are modulated by lithium and stress. *Biological Psychiatry*, 2012

- J. Zhang, Y. Barhomi & T. Serre. A new biologically inspired color image descriptor. In Proc. of European Computer Vision Conference, 2012
- M. Cauchoix, A. Arlsan, D. Fize & T. Serre. The neural dynamics of visual processing in monkey extrastriate cortex: A comparison between univariate and multivariate techniques. Neural Information Processing Systems – Workshop on Machine Learning and Interpretation in Neuroimaging, 2012
- S.M. Crouzet & T. Serre. What are the visual features underlying rapid recognition? Front. Psychology (Special issue on ‘The Timing of Visual Recognition’) 2:326. doi: 10.3389/fpsyg.2011.00326, 2011
- H. Kuhne, H. Jhuang, E. Garrote, T. Poggio and T. Serre. HMDB: A large database for human motion recognition. In: Proceedings of the Thirteenth IEEE International Conference on Computer Vision (ICCV), 2011
- Y. Zhang*, E. Meyers*, N. Bichot, T. Serre, T. Poggio & R. Desimone. Object decoding with attention in inferior temporal cortex. Proceedings of the National Academy of Sciences. 108(21), pp. 8850-8855, 2011
- S. Chikkerur, T. Serre, C. Tan and T. Poggio. What and Where: A Bayesian inference theory of attention. In: Vision Research, 55(22), pp. 2233–2247, Oct 2010
- T. Serre and T. Poggio. Reverse-engineering the brain. In: the Communications of the Association for Computing Machinery (CACM), 53(10), pp. 54-61, Oct 2010
- H. Jhuang, E. Garrote, X. Yu, V. Khilnani, T. Poggio and A. Steele and T. Serre. Automated home-cage behavioral phenotyping of mice. In: Nature Communications 1(1), doi:10.1038/ncomms1064, 2010
- R. Kliper, T. Serre, D. Weinshall and I. Nelken. The story of a single cell: Peeking into the semantics of spikes. In Proc. of the second International Workshop on Cognitive Information Processing, 2010
- L. Reddy, N. Tsuchyia and T. Serre. Reading the mind’s eye: Decoding object information during mental Imagery from fMRI patterns. Neuroimage, 50(2), pp. 818-825, 2010
- T. Serre, G. Kreiman, M. Kouh, C. Cadieu, U. Knoblich and T. Poggio. A quantitative theory of immediate visual recognition. In: Progress in Brain Research, Computational Neuroscience: Theoretical Insights into Brain Function, 165, pp. 33-56, 2007
- T. Serre, A. Oliva and T. Poggio. A feedforward architecture accounts for rapid categorization. Proceedings of the National Academy of Science, 104(15), pp. 6424-6429, 2007
- T. Serre, L. Wolf, S. Bileschi, M. Riesenhuber and T. Poggio. Object recognition with cortex-like mechanisms. In: IEEE Transactions on Pattern Analysis and Machine Intelligence, 29 (3), pp. 411-426, 2007
- H. Jhuang, T. Serre, L. Wolf and T. Poggio. A biologically inspired system for action recognition. In: Proceedings of the Eleventh IEEE International Conference on Computer Vision (ICCV), 2007
- B. Heisele, T. Serre and T. Poggio. A component-based framework for face detection and identification. In: International Journal of Computer Vision, 74(2), pp. 167-181, 2007
- R. Sigala, T. Serre, T. Poggio and M. Giese. Learning features of intermediate complexity for the recognition of biological motion. In: ICANN 2005, Warsaw, Poland, pp 241-246, 2005
- T. Serre, L. Wolf and T. Poggio. Object recognition with features inspired by visual cortex. In: Proceedings of 2005 IEEE Computer Society Conference on Computer Vision and Pattern Recognition (CVPR 2005), IEEE Computer Society Press, San Diego, 2005
- Y. Ivanov, B. Heisele and T. Serre. Using component features for face recognition. In: International Conference on Automatic Face and Gesture Recognition, Seoul, Korea, 2004
- B. Heisele, T. Serre, S. Prentice and T. Poggio. Hierarchical classification and feature reduction for fast face detection with support vector machines. In: Pattern Recognition, 36, 2007-2017, 2003
- B. Heisele, T. Serre, M. Pontil, T. Vetter and T. Poggio. Categorization by learning and combining object parts. In: Advances in Neural Information Processing Systems (NIPS’01), Vancouver, Canada, 2002
- T. Serre, J. Louie, M. Riesenhuber and T. Poggio. On the role of object-specific features for real-world object recognition in biological vision. In: Workshop on Biologically Motivated Computer Vision (BMCV 2002), Tübingen, Germany, November 2002
- B. Heisele, T. Serre, M. Pontil and T. Poggio. Component-based face detection. In: Proceedings of IEEE Computer Society Conference on Computer Vision and Pattern Recognition (CVPR 2001), IEEE Computer Society Press, Kauai, Hawaii, Vol. 1, pp 657-662, 2001

B. Heisele, T. Serre, S. Mukherjee and T. Poggio. Feature reduction and hierarchy of classifiers for fast object detection in video images. In: Proceedings of IEEE Computer Society Conference on Computer Vision and Pattern Recognition (CVPR 2001), IEEE Computer Society Press, Kauai, Hawaii, Vol. 2, pp 18-24, 2001

d. Non-refereed journal articles

- H. Kuehne & T. Serre. Cooking in the kitchen: A generative approach to the recognition, parsing and segmentation of human daily activities. CoRR abs/1508.06073 (2015)
- H. Kuehne & T. Serre. Towards a generative approach to activity recognition and segmentation. CoRR abs/1509.01947 (2015)
- M. Cauchoix, S. Crouzet, D. Fize & T. Serre. Fast ventral stream neural activity enables rapid visual categorization. BioRxiv. <http://dx.doi.org/10.1101/017897>, April 2015
- T. Serre, H. Jhuang, E. Garrote, T. Poggio & A. Steele. Automatic recognition of rodent behavior: A tool for systematic phenotypic analysis. CBCL paper #283/MIT-CSAIL-TR #2009-052, Massachusetts Institute of Technology, Cambridge, MA, October 2009
- S. Chikkerur, T. Serre and T. Poggio. A Bayesian inference theory of attention: Neuroscience and algorithms. CBCL paper #280/MIT-CSAIL-TR #2009-047, Massachusetts Institute of Technology, Cambridge, MA, October 2009
- S. Chikkerur, T. Serre and T. Poggio. Attentive processing improves object recognition. CBCL #279/MIT-CSAIL #TR-2009-046, Massachusetts Institute of Technology, Cambridge, MA, October 2009
- S. Chikkerur, T. Serre, C. Tan and T. Poggio. The role of top-down feature-based and contextual guidance mechanisms in complex natural visual search, CBCL paper #278 /MIT-CSAIL-TR #2009-029, Massachusetts Institute of Technology, Cambridge, MA, 2009
- T. Masquelier, T. Serre, S. Thorpe and T. Poggio. Learning complex cell invariance from natural videos: a plausibility proof, CBCL Paper #269/MIT-CSAIL-TR #2007-060, Massachusetts Institute of Technology, Cambridge, MA, 2007
- T. Serre. Learning a dictionary of shape-components in visual cortex: Comparison with neurons, humans and machines, PhD Thesis, CBCL Paper #260/MIT-CSAIL-TR #2006-028, Massachusetts Institute of Technology, Cambridge, MA, April, 2006
- T. Serre, M. Kouh, C. Cadieu, U. Knoblich, G. Kreiman and T. Poggio. A theory of object recognition: computations and circuits in the feedforward path of the ventral stream in primate visual cortex, CBCL Paper #259/AI Memo #2005-036, Massachusetts Institute of Technology, Cambridge, MA, 2005
- Y. Ivanov, T. Serre, and J. Bouvrie. Error weighted classifier combination for multi-modal human identification. CBCL Paper #258/AI Memo #2005-035, Massachusetts Institute of Technology, Cambridge, MA, 2005
- T. Serre, L. Wolf and T. Poggio. A new biologically motivated framework for robust object recognition, CBCL Paper #243/AI Memo #2004-026, Massachusetts Institute of Technology, Cambridge, MA, 2004
- T. Serre and M. Riesenhuber. Realistic modeling of simple and complex cell tuning in the HMAX model, and implications for invariant object recognition in cortex, CBCL Paper #239/AI Memo #2004-017, Massachusetts Institute of Technology, Cambridge, MA, 2004
- T. Serre, B. Heisele, S. Mukherjee and T. Poggio. Feature selection for face detection, CBCL Paper #192/AI Memo #1697, Massachusetts Institute of Technology, Cambridge, MA, 2000

e. Book reviews

NA

f. Abstracts

D. Mély & T. Serre. A canonical circuit for visual contextual integration explains induction effects across visual modalities, Vision Science Society, 2015

- A. Pascarella, C. Todaro, M. Clerc, T. Serre and M. Piana. Source modelling of ElectroCorticoGraphy (ECoG) data: Analysis of stability and spatial filtering. International Conference on Basic and Clinical Multimodal Imaging, 2015
- D. Mély & T. Serre. A canonical circuit for visual contextual integration explains induction effects across visual modalities. Computational and Mathematical Models in Vision, 2015
- J. Kim, D. Mély & T. Serre. A critical evaluation of computational mechanisms of binocular disparity processing in V1, Computational and Mathematical Models in Vision, 2015
- A.M. Duffy, X. Li, C. Schmiedel, S. Mentzer, K. Bath, T. Serre, J. Fallon. Automated Continuous Behavioral Monitoring reveals novel phenotypes in mouse models of ALS and Muscular Dystrophy. Muscular Dystrophy Association, 2015.
- M. Clerc, C. Todaro, A. Pascarella, T. Serre & M.A Piana. BeamFormer for source localization in ElectroCorticoGraphy. Biomag 2014
- Y. Barhomi, S. Bonneaud, A. Janke, W. Warren & T. Serre. A data-driven approach to learning strategies for the visual control of navigation, Vision Science Society, 2014
- D. Mely, J.K. Kim, M. McGill, Y. Guo & T. Serre. Visual cue diagnosticity for boundary detection in natural scenes: A computational study, Vision Science Society, 2014
- R. Le, D. Mely & T. Serre. Computational Mechanisms Responsible for the Hermann Grid Illusion, Vision Science Society, 2014
- S. Parker, D. Reichert & T. Serre. Selectivity for non-accidental properties emerges from learning object transformation sequences, Vision Science Society, 2014
- T. Serre, I. Sofer, & S. Crouzet. A simple rapid categorization model accounts for variations in behavioral responses across rapid scene categorization tasks, Vision Science Society, 2014
- D. Reichert & T. Serre. Binding by synchrony in complex-valued deep neural networks. Computational System Neuroscience (Cosyne), 2014.
- S. Bonneaud, W. H. Warren, K. Olfers, G. Irwin, T. Serre. Towards a biologically-inspired vision system for the control of locomotion in complex environments, Vision Science Society, 2013
- I. Sofer, K.R. Lee, P. Sailamul, S. Crouzet & T. Serre. Understanding the nature of the visual representations underlying rapid categorization tasks, Vision Science Society, 2013
- D. Mély & T. Serre. Computational models of contour detection: role of lateral connections, inhibition and normalization, Vision Science Society, 2013
- P. Wilf, S. Chikkerur, S. Little, S. Wing & T. Serre. Leaf Architecture: Computer Vision Cracks the Leaf Code, Botany 2013.
- D. Mely & T. Serre. Computational models of contour detection: Role of lateral connections, inhibition and normalization, Computational System Neuroscience (Cosyne) 2013
- P. Wilf, S. Chikkerur, S. Little, S. Wing & T. Serre. Computer vision cracks the leaf code. Geological Society of America (GSA), 2012
- I. Sofer & T. Serre. Using decision models to study the time course of visual recognition, Vision Science Society 2012
- M. Cauchoix, S. Crouzet, D. Fize & T. Serre. Visual features and dynamics of rapid recognition in monkey visual cortex. Society for Neuroscience, 2011
- M.P. Leussis, E.M. Berry-Scott, H. Jhuang, M. Saito, K. Ilesley, T. Poggio, P. Sklar, T. Serre and T.L. Petryshen. Role of Ankyrin 3 in regulating bipolar-related behaviors. World Congress on Psychiatric Genetics, 2011
- C. Tan, T. Serre & T. Poggio. How does the visual system create complex shape and motion features? Vision Science Society 2011
- S. M. Crouzet*, T. Stemmler*, M. Capps, M. Fahle, and T. Serre. Single-trial decoding of binocular rivalry switches from oculometric and pupil data. Vision Science Society 2011
- A. Arslan, J. Singer, M. Cauchoix, J. Madsen, G. Kreiman and T. Serre. The neural basis of rapid visual recognition: Neural decoding and Granger causality analysis of connectivity. Vision Science Society 2011
- J. Corbett & T. Serre. ERP signatures of Gestalt cues predict perceptual segmentation. Vision Science Society 2011

- I. Sofer, D. Weinshall and T. Serre. Analysis of similarity matrices and its application to the study of semantic and visual information processing in the inferior temporal cortex. Vision Science Society 2011
- A.B. Arslan, M. Cauchoix, D. Fize, G. Kreiman, J.R. Madsen, T. Serre and, J.M. Singer. Neural decoding of natural object categories from intracranial field potentials: A comparison between human and monkey. Society for Neuroscience, Nov. 2010
- E. M. Meyers, Y. Zhang, N. Bichot, T. Serre, T. Poggio and R. Desimone. The representation of objects in inferior temporal cortex with and without attention. Society for Neuroscience, Nov. 2010.
- D. Hassabis, C. Tan, T. Serre and T. Poggio. Identifying objects from brain activity in high-level visual cortex. Society for Neuroscience, Nov. 2010
- S. Pandian, N. Edelman, H. Jhuang, T. Serre, T. Poggio and M. Constantine-Paton. An automated action initiation system reveals behavioral deficits in MyosinVa deficient mice. Society for Neuroscience, Nov. 2010.
- C. Tan, V. Yorgan, T. Serre, D. Sheinberg and T. Poggio. Do dorsal stream neurons encode combinations of local motion direction? Society for Neuroscience, Nov. 2010
- T. Poggio, H. Jhuang and T. Serre. Computational mechanisms of motion processing in visual area MT. Society for Neuroscience, Nov. 2010
- M Cauchoix, T Serre, G Kreiman and D Fize. Fast decoding of natural object categories from intracranial field potentials in monkey's visual cortex. Vision Science Society, May 2010
- C Tan, J Singer, T Serre, D Sheinberg and T Poggio. How STS recognizes actions: Predicting single-neuron responses in higher visual cortex. Vision Science Society, May 2010
- Y. Zhang, E.M. Meyers, N.P. Bichot, S. Chikkerur, T. Serre, R. Desimone and T. Poggio. Read-out of inferior temporal cortex population activity: Spatial attention eliminates clutter. Society for Neuroscience, Oct 2009
- T. Serre, H. Jhuang, E. Garrote, T. Poggio and A. Steele. A computer vision system for the automated analysis of rodent behavior. Society for Neuroscience, Oct 2009
- C. Tan, H. Jhuang, J. Singer, T. Serre, D. Sheinberg and T. Poggio. Computational mechanisms for the recognition of time sequences of images in the visual cortex. Society for Neuroscience, Oct 2009
- P. Wilf, S. Chikkerur, S.A. Little, S.L. Wing and T. Serre. Leaf identification automated using a computational model of the primate vision system: preliminary results. Botanical Society of America Annual Meeting, Snowbird, Utah, abstract 584, abstracts volume p. 165, July 2009.
- T. Serre, L. Reddy, N. Tsuchyia, M. Fabre-Thorpe and C. Koch. Reading the mind's eye: Decoding object Information during mental Imagery from fMRI patterns. Vision Science Society, May 2009
- C. Tan, T. Serre, S. Chikkerur, T. Poggio. Feature-based and contextual guidance mechanisms in complex natural visual search. Vision Science Society, May 2009
- B. Wyble, M. Potter, T. Serre and M. Giese. Identification of point light walkers exhibits an attentional blink. Vision Science Society, May 2009
- T. Serre, L. Reddy, N. Tsuchyia, M. Fabre-Thorpe and C. Koch. Reading the mind's eye: Decoding object Information during mental Imagery from fMRI patterns. Computational System Neuroscience (Cosyne), Feb. 2009
- L. Reddy, T. Serre, N. Tsuchyia, M. Fabre-Thorpe and C. Koch. Reading the mind's eye: Decoding object Information during mental Imagery from fMRI patterns. Society for Neuroscience, Nov. 2008
- E. Meyers, H. Embark, W. Freiwald, T. Serre, G. Kreiman and T. Poggio. Neural representation of cluttered scenes in macaque ventral visual cortex. Society for Neuroscience, Nov. 2008
- S. Chikkerur, T. Serre, C. Tan and T. Poggio. The role of top-down feature-based and contextual guidance mechanisms in complex natural visual search. Society for Neuroscience, Nov. 2008
- C. Tan, T. Serre and T. Poggio. Implicit coding of location, scale and configural information in feedforward hierarchical models of the visual cortex. Vision Science Society, May 2008
- T. Serre and M. Giese. Rapid Serial Action Presentation: New paradigm for the study of movement recognition. Vision Science Society, May 2007
- G. Kreiman, T. Serre and T. Poggio. On the limits of feed-forward processing in visual object recognition. Vision Science Society, May 2007

- T. Masquelier, T. Serre, S. Thorpe and T. Poggio. Learning simple and complex cells-like receptive fields from natural images: a plausibility proof. Vision Science Society, May 2007
- G. Kreiman, T. Serre and T. Poggio. On the limits of feed-forward processing in visual object recognition. Computational System Neuroscience (Cosyne), Feb 2007
- T. Serre, A. Oliva and T. Poggio. Feedforward theories of visual cortex predict human performance in rapid categorization, Vision Science Society, May 2006
- T. Serre, M. Kouh, C. Cadieu, U. Knoblich, G. Kreiman, T. Poggio. A theory of object recognition: computations and circuits in the feedforward path of the ventral stream in primate visual cortex, Computational System Neuroscience (Cosyne), Salt Lake City, Mar 2006
- R. Sigala, T. Serre, T. Poggio, M. Giese and A. Casile. Mid-level motion features for the recognition of biological movements, ECVF, Aug 2005
- T. Serre and T. Poggio. Standard Model v2.0: How visual cortex might learn a universal dictionary of shape-components, Vision Science Society, May 2005
- D. Walther, T. Serre, T. Poggio and C. Koch. Modeling feature sharing between object detection and top-down attention, Vision Science Society, May 2005
- R. Sigala, T. Serre, T. Poggio, and M. Giese, Learning mid-level motion features for the recognition of body movements, Vision Science Society, May 2005
- T. Serre and T. Poggio. Learning a dictionary of shape-components in visual cortex. Computational System Neuroscience (Cosyne), Mar 2005
- T. Serre, T. Poggio and P. Sinha. Face-detection by humans and machines, Vision Science Society, May 2004

g. Invited lectures (since 2006)

- May 2015 Genova University (Genova, Italy), Computer Science seminar
Towards a system-level theory of computation in the visual cortex
- May 2015 Workshop on Deep Learning (Bertinoro, Italy)
Towards a system-level theory of computation in the visual cortex
- May 2015 Columbia University (New York, NY), Theoretical Neuroscience Seminar
Towards a system-level theory of computation in the visual cortex
- Apr 2015 Massachusetts Institute of Technology (Cambridge, MA), Brains, Minds and Machines Seminar
Towards a system-level theory of computation in the visual cortex
- Mar 2015 University of Maryland (University Park, MD), Neuroscience Seminar
Towards a system-level theory of computation in the visual cortex
- Nov 2014 Institut de la vision (Paris, France)
Computational models of rapid visual recognition
- Oct 2014 Washington University (St Louis, MO)
Computational models of rapid visual recognition
- Sep 2014 Bristol-Myers Squibb (Wallingford, CT)
High-throughput automated behavioral phenotyping and applications to muscle disease models (joint talk with Justin Fallon, Brown U)
- Sep 2014 Indiana University (Bloomington, IN)
Computational models of rapid visual recognition
- Sep 2014 Johns Hopkins University Applied Physics Laboratory (Laurel, MD)
Computational models of rapid visual recognition
- July 2014 Université de Bretagne Sud (Lorient, France)
Computational models of rapid visual categorization
- July 2014 Telecom Bretagne (Brest, France)
Computational models of rapid visual categorization
- July 2014 NeuroStic Conference (Paris, France)
Computational models of rapid visual categorization

May 2014 Design Automation Conference (San Francisco, CA)
Computational models of the visual cortex

Apr 2014 Vision Science Society annual meeting (St. Pete Beach, FL) [contributed]
A simple rapid categorization model accounts for variations in behavioral responses across rapid scene categorization tasks

Apr 2014 MIT, 9.S913 - Understanding Visual Attention through Computation (Boston, MA)
Bayesian models of attention

Nov 2013 Workshop on Learning Data Representation (Cambridge, MA)
Computational models of the visual cortex

Apr 2013 SUNY University (New York, NY)
Computational mechanisms of color processing

Jul 2012 IPAM Graduate Summer School: Deep Learning, Feature Learning (Los Angeles, CA)
Bottom-up and top-down processing in visual perception

Jul 2012 Neuromorphic Engineering workshop (Telluride, CO)
Bottom-up and top-down processing in visual perception

Jun 2012 ONR Comp. Neuroscience, Vision and Acoustic Systems Program Review (Washington, DC)
Computational mechanisms for the visual control of navigation

Jan 2012 The University of Memphis (Memphis, TE)
Bottom-up and top-down processing in visual perception

Mar 2011 Edinburgh University (UK)
Automated home-cage behavioral phenotyping of mice

Mar 2011 Harvard University, Schwartz Institute for Theoretical Neuroscience seminar series (Cambridge, MA)
Bottom-up and top-down processing in visual perception

Feb 2011 Workshop on Grand Challenges in Neural Computation (Santa Fe, NM)
Bottom-up and top-down processing in visual perception

Jan 2011 Scene Understanding (SUnS) symposium (Cambridge, MA)
What and where: A Bayesian inference theory of attention

Nov 2010 Brown University (Applied math department, Theory seminar)
Bottom-up and top-down processing in visual perception

June 2010 Workshop on the "Interplay between inversion methods and mathematical models in the applied sciences" (SIMAI'10, Cagliari, Italy)
Tracking the time course of visual recognition with dynamical MEG source modeling

Mar 2010 Columbia University (New York, NY)
Bottom-up and top-down processing in visual perception

Feb 2010 Max Planck Institute for Cybernetics (Tubingen, Germany)
Computational models of the visual cortex

Jan 2010 Los Alamos National Laboratory (Los Alamos, NM)
Bottom-up and top-down processing in visual perception

Dec 2009 CIFAR NCAP workshop on NCAP on Neural Computation and Adaptive Perception (Vancouver, Canada)
Bottom-up and top-down processing in visual perception

Nov 2009 MIT, 9.77 Computational Perception (Boston, MA)
Cortical mechanisms of invariant recognition

Oct 2009 Brown Institute for Brain Science (Providence, RI)
Can neuroscience help computer science and vice-versa?

Oct 2009 International Graduate School for Neuroscience (Bochum, Germany)
Cortical mechanisms for invariant object recognition

Aug 2009 Yale University (New Haven, CT)
A biologically-motivated approach to computer vision

May 2009 Neovision2 Industry Day (Arlington, VA)
A neuromorphic approach to computer vision

May 2009 Vision Science Society (Naples, Florida) [contributed]
Reading the mind's eye: Decoding object information during mental imagery from fMRI patterns

Apr 2009 Berkeley University, Redwood Center for Theoretical Neuroscience (Berkeley, CA)
Mechanisms of bottom-up and top-down processing in visual perception

Apr 2009 MIT, 2.151 Robotics (Boston, MA)
Computational models of high-level vision

Apr 2009 MIT, 9.520 Statistical learning theory and applications (Boston, MA)
Vision and visual neuroscience

Apr 2009 Mitsubishi Electric Lab MERL (Boston, MA)
A biologically-motivated approach to action recognition

Mar 2009 Janelia Farms research campus (Leesburg, VA)
Can computer science help neuroscience and vice-versa?

Mar 2009 Brown University, Department of Cognitive and Linguistics Sciences (Providence, RI)
Mechanisms of bottom-up and top-down processing in visual perception

Feb 2009 Boston University, CN 730 (Boston, MA)
Computational models of high-level vision

Dec 2008 NIPS Workshop on "Cortical microcircuits" (Vancouver, Canada)
Microcircuits for perception

Aug 2008 American Psychology Association (APA) Workshop on "How animals, humans, and computer models remember visual objects" (Boston, MA)
Computational models of object recognition in cortex

Sep 2008 Burroughs Wellcome Fund (Research Triangle Park, NC)
Learning and recognition of temporal sequences in the visual cortex

Apr 2008 MIT, 9.9520 Statistical learning theory and applications (Boston, MA)
Vision and visual neuroscience

Mar 2008 Computational System Neuroscience (Cosyne) Workshop on "Dynamic faces" (Salt Lake, UT)
Processing of dynamic stimuli: A computational neuroscience perspective

Dec 2007 CIFAR NCAP Workshop on "Achieving perceptual invariance" (Vancouver, Canada)
Learning a dictionary of shape-components in visual cortex

Nov 2007 University of South California, Department of Psychology (Los Angeles, CA)
Learning a dictionary of shape-components in visual cortex

Oct 2007 CalTech, Department of Biology (Pasadena, CA)
Learning a dictionary of shape-components in visual cortex

Jul 2007 MIT, Small-talk seminar (Boston, MA)
Learning a dictionary of shape-components in visual cortex

Jun 2007 Workshop "A journey through computation" (Genoa, Italy)
Learning a dictionary of shape-components in visual cortex

May 2007 Vision Science Society (Vision Science Society), (Sarasota, FL) [contributed]
Rapid Serial Action Presentation: New paradigm for the study of movement recognition

May 2007 Mitsubishi Electric Research Laboratories (Boston, MA)
Learning a dictionary of shape-components in visual cortex

Apr 2007 MIT, 9.9520 Statistical learning theory and applications (Boston, MA)
Vision and visual neuroscience

Feb 2007 Computational System Neuroscience (Cosyne) Workshop on "Functional requirements of a visual theory" (Whistler, UT)
Functional requirements of a visual theory

Oct 2006 MIT, 9.912 Special topics in brain and cognitive sciences (Boston, MA)
Explaining rapid categorization

- Jun 2006 McGovern retreat (Newport, RI)
A theory of object recognition in cortex: Predicting human performance
- May 2006 MIT, 9.913 Pattern recognition for machine vision (Boston, MA)
Object recognition in cortex
- Apr 2006 MIT, 9.9520 Statistical learning theory and applications (Boston, MA)
Neuroscience and models of object recognition in the cortex
- Feb 2006 MIT, Scene Understanding Symposium (Boston, MA)
A feedforward architecture accounts for rapid categorization

h. Papers read

NA

i. Work in review

- Y. Guo, S. Zhang, X. Li, B. Kimia & T. Serre. Automated social behavior analysis in rodents (in submission)
- P. Wilf, S. Zhang, S. Chikkerur, S.A. Little, S.L. Wing & T. Serre. Computer Vision Cracks the Leaf Code (in revision, PNAS)
- K.G. Bath, G. Manzano-Nieves, X. Li, T. Serre, H. Lee & H. Goodwill. Early life stress accelerates neural and behavioural maturation (in submission, Biological Psychiatry)
- A. Pascarella, C. Todaro, M. Clerc, T. Serre and M. Piana. Source modelling of ElectroCorticoGraphy (ECoG) data: Analysis of stability and spatial filtering (in revision, J. Neurosci. Methods)

j. Work in progress

- J. Brodsky, K. Takayama & T. Serre. Enhancing STEM learning through machine vision and crowdsourcing (in prep)
- J. Zhang, D. Mely & T. Serre. Computational mechanisms of color perception (in prep).
- Y. Barhomi, D. Mely, S. Bonneaud, B. Warren & T. Serre. A data-driven approach to the visual control of navigation (in prep)
- A. Arslan, J. Brochard & T. Serre. Learning structure from motion with a paired dictionary learning approach (in prep)
- S. Zhang, M. Cauchoix, Y. Barhomi, J. Morand-ferron, A. Chainé, T. Serre. SADAB: Semi-automated toolbox to detect and annotate animal individual and social behaviours in nature from video files (in prep)
- J. Kim, D. Mély & T. Serre. A critical evaluation of computational mechanisms of binocular disparity processing in V1 (in prep)

6. Research Grants

a. Current grants

Project title: ***Scaling up computational models of visual processing in cortex***

Funding agency: DARPA

Grant type: DARPA Young Faculty Award

Grant number: N66001-14-1-4037

Role: PI

Award: \$500,000

Duration: 2014–2016

Status: Active

Project title: ***Computational mechanisms of rapid visual categorization: Models and psychophysics***

Funding agency: National Science Foundation (NSF)

Grant type: NSF early career award

Grant number: IIS-1252951

Role: PI

Award: \$500,001
Duration: 2013–2018
Status: Funded

Project title: ***WildCog: Evolution and local adaptation of cognitive abilities and brain structure in the wild***

Funding agency: Human Frontier Science Program (HFSP)

Grant type: Research grant

Grant number: RGP0006/2015

Role: co-Applicant (main applicant: Dr Chaine, CNRS, France; other co-applicants: Dr Morrand-Ferron, U. Ottawa, Canada and Dr Verhoye, U. Antwerp, Belgium)

Award: \$1,350,000

Duration: 2015–2018

Status: Funded

Project title: ***Using big data to crack the neural code.***

Funding agency: internal

Grant type: 2014 seed award

Grant number: NA

Role: PI

Award: \$60,000

Duration: 2014–2016

Status: Funded

b. Completed grants

Project title: ***Studying bird visual cognition in natura.***

Funding agency: internal

Grant type: 2014 CVR grant

Grant number: internal

Role: PI

Award: \$8,000

Duration: 2014–2015

Status: Funded

Project title: ***Towards a biologically-inspired vision system for the control of navigation in complex environments***

Funding agency: Office of Naval Research (ONR)

Grant type: ONR Grant Application

Grant number: N000141110743

Role: PI

Award: \$839,227

Duration: 2011–2014

Status: Completed

Project title: ***Development of a machine-learning and computer-vision platform for automated behavioral analysis***

Grant type: Sponsored research

Role: PI

Award: \$262,639

Duration: 2012–2013

Status: Completed

Project title: ***Brain-like computing system for analyzing visual scenes***
Grant type: Robert J. and Nancy D. Carney Fund for Scientific Innovation
Role: PI
Award: \$550,000
Duration: 2011–2014
Status: Completed

Project title: ***Towards a human-level neuromorphic artificial visual system***
Funding agency: Defense Advanced Research Projects Agency (DARPA)
Grant type: DARPA Grant Application
Grant number: N10AP20013
Role: PI
Award: \$543,332.
Duration: 2010–2011
Status: Completed

c. Proposals submitted

- Blavatnik Foundation, role PI
- NSF expedition (PI: Michael Littman, Brown), role: co-PI
- NSF EPSCoR (PI: Peter Tse, Dartmouth), role: co-I
- Human Frontier in Science Program (main Applicant: Alexis Chaine, CNRS, France), role: co-Applicant

7. Service

i. To the University

- Whalen Award for undergraduate research excellence in neuroscience and behavioral biology committee (2011)
- Faculty sponsor for the Cognitive Neuroscience Departmental Undergraduate Group (DUG, 2011–2012)
- Freshman and sophomore advisor (2011–present)
- CLPS Strategic planning committee (2011–present)
- Brown Academic Technology Steering Committee (2012–present)
- Independent concentration advisor on "Intelligent Systems" (2012–2014)
- Selection committee for COSAT Translational Innovation Partnership Awards Program (2012)
- Academic Technology Steering Committee (2012–)
- BIBS cluster Executive Committee (2013–present)
- Computation in Brain and Mind Initiative steering committee (2013–present)
- CCV Executive Director Search Committee (2014)
- Independent concentration advisor in "Computational neuroscience" (2014–2016)
- Cognitive Science undergraduate concentration advisor (2015–)
- Research Computing Advisory Committee (2015–)

ii. To the profession

NA

iii. To the community, each category organized separated and chronologically.

Journal editor

Frontiers in Perception Science (2011–)

Area chair for conferences

Computer Vision and Pattern Recognition conference (CVPR 2014), Neural Information Processing Systems (NIPS 2011)

Ad-hoc reviewing for organizations and funding agencies:

Army Research Office (ARO, 2011, 2014), Austrian Science Fund (FWF, 2011), French National Research Agency (ANR, 2015–), German Federal Ministry of Education and Research (Bernstein award 2011), Italian Ministry of Science (2012), National Center for the Replacement, Refinement and Reduction of Animals in Research (NC3Rs, UK, 2012), National Science Foundation (2007–present), Netherlands Organization for Scientific Research (2009 – present), Minerva-Weizmann program (2009).

Ad-hoc reviewing for conferences

Computer vision conferences (since 2005): Conference on Computer Vision and Pattern Recognition (CVPR), European Conference on Computer Vision (ECCV), International Conference on Computer Vision (ICCV), International Conference on Learning Representations (ICLR), International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI), Visual observation and analysis of animal and insect behavior.

Computational neuroscience/cognitive science conferences: Cognitive Science Society Annual Conference (CogSci), Computational and System Neuroscience (Computational System Neuroscience (Cosyne), since 2009), Neural Information Processing Systems (NIPS, since 2006).

Ad-hoc reviewing for journals

Neuroscience, vision, psychology and general science journals: Animal Cognition (AC), Cerebral Cortex (CC), Cognition, Consciousness and Cognition, Frontiers journals, Journal of Experimental Psychology: Human Perception and Performance (JEP: HPP), Journal of Experimental Psychology: General (JEP), Journal of Neurophysiology, Journal of Vision (JoV), Neuron, Neuropsychologia, Perception, PLOS Computational Biology, PLOS One, Proceedings of the National Academy of Sciences (PNAS), Psychological Sciences, Neuron, Vision Research.

Computational neuroscience, AI and computer vision journals: Biological Cybernetics (BC), Computer Vision and Image Understanding (CVIU), IET Computer Vision, Image and Vision Computing Journal (IMAVIS), Iranian Journal of Electrical and Computer Engineering (IJECE), International Journal of Computer Vision (IJCV), IEEE Transactions on Autonomous Mental Development, IEEE Transactions on Circuits and Systems for Video Technology (TCSVT), IEEE Transactions on Image Processing (TIP), IEEE Transactions on Autonomous Mental Development (TAMD), IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI), IEEE Transactions on Systems, Man, and Cybernetics, Part B (SMCB), IEEE Signal Processing Letters, International Journal of Pattern Recognition and Artificial Intelligence (IJPRAI), Journal of Artificial Intelligence Research (JAIR), Journal of Signal Processing Systems, Neural Computation, Neurocomputing, Machine Vision and Applications (MVA).

Ad-hoc reviewing for publishers

MIT press, SAGE.

Organization of meetings

Co-organizer of the *Scene Understanding Symposium* (SUnS) (2006–2011) with Prof. Aude Oliva and Prof. Antonio Torralba. See [web site](#) for details.

Other

2015–present Consultant / domain expert for IARPA's Machine Intelligence from Cortical Networks (MICrONS) program

8. Academic honors, fellowships, honorary societies, listed chronologically.

2008	Finalist for the Burroughs Wellcome Fund career award at the scientific interface.
2010	Nominated for the Packard fellowship for science & engineering.
2011–2012	Sheridan Junior Faculty Teaching Fellows Program.
2012	Teaching with Technology Course Design Award.
2013	Panelist for the National Academies Keck Futures Initiative on ‘The informed brain in a digital world.
2013	Manning Assistant Professor
2013	NSF early career award
2014	DARPA young faculty award

Professional memberships: Cognitive Neuroscience Society, IEEE Society, Organization for Computational Neuroscience, Society for Neuroscience, Vision Science Society.

9. Teaching: chronologically, for the last three years.

Spring 2016	Brown University, Department of Cognitive & Linguistic Sciences CLPS 1291 Computational Cognitive Science 30 enrolled students Directed reading/research (CLPS1970/1980) and ind. studies (NEUR1970) 3 students total
Fall 2015	Brown University, Department of Cognitive & Linguistic Sciences CLPS 1520 Computational Vision 46 enrolled students Directed reading/research (CLPS1970/1980) and ind. studies (NEUR1970) 4 students total
Spring 2015	Brown University, Department of Cognitive & Linguistic Sciences CLPS 1291 Computational Cognitive Science 28 enrolled students Brown University, Department of Cognitive & Linguistic Sciences CLPS 1520 Computational Vision 9 enrolled students

Directed reading/research (CLPS1970/1980) and ind. studies (NEUR1970)
2 students total

Fall 2014 Sabbatical

Directed reading/research (CLPS1970/1980) and ind. studies (NEUR1970)
1 student total

Spring 2014 **Brown University, Department of Cognitive & Linguistic Sciences**
CLPS 1291 Computational Cognitive Science
27 enrolled students

Brown University, Department of Cognitive & Linguistic Sciences
CLPS 1520 Computational Vision
12 enrolled students

Directed reading/research (CLPS1970/1980) and ind. studies (NEUR1970)
6 students total

Fall 2013 Parental teaching relief

Directed reading/research (CLPS1970/1980) and ind. studies (NEUR1970)
6 students total

Spring 2013 **Brown University, Department of Cognitive & Linguistic Sciences**
CLPS 1291 Computational Cognitive Science
33 enrolled students

Directed reading/research (CLPS1970/1980) and ind. studies (NEUR1970)
3 students total

Fall 2012 **Brown University, Department of Cognitive & Linguistic Sciences**
CLPS 1520 Computational Vision
14 enrolled students

Directed reading/research (CLPS1970/1980) and ind. studies (NEUR1970)
3 students total

Spring 2012 **Brown University, Department of Cognitive & Linguistic Sciences**
CLPS 1291 Computational Cognitive Science
23 enrolled students

Directed reading/research (CLPS1970/1980) and ind. studies (NEUR1970)
4 students total

Fall 2011 **Brown University, Department of Cognitive & Linguistic Sciences**
CLPS 1520 Computational Vision
30 enrolled students

Directed reading/research (CLPS1970/1980) and ind. studies (NEUR1970)
1 student total

Mentoring

Postdoctoral fellows (7)

- S. Bonneaud (Sep. 2012–Sep. 2013)
- J. Corbett (Jan. 2010–Jul. 2011)
- S. Crouzet (Sep. 2010–Sep. 2012)
- S. Eberhardt (June. 2015–present)
- H. Jhuang (Jun. 2011–Dec. 2011)
- D. Reichert (Nov 2012–Aug 2014)
- S. Zhang (Feb. 2013– Feb. 2014)

Graduate student advisees (7 supervised, 2 co-supervised)

- A. Arslan (CLPS, 2010–2015)
- J.K. Kim (CLPS, 2014–present)
- D. Mely (CLPS, 2011–present)
- M. Ricci (CLPS, 2014–present)
- I. Sofer (CLPS, 2011–2014)

Students co-advised:

- Y. Guo (Engineering, 2013–present, co-supervised with Ben Kimia)
- J. Zhang (Hefei University, China, 2011–present, co-supervised with Jun Gao)

Full-time research staff and lab managers (5)

- Y. Barhomi (2010–2016)
- M. Capps (2010–2011)
- X. Li (2011–2015)
- Y. Guo (2012)
- Y. Wang (2015–2016)

PhD thesis committee (10):

- D. Buchanan (CLPS, Advisor: David Sobel, 2010)
- D. Burk (Neuroscience, Advisor: David Sheinberg, 2017)
- S. Dimitriadis (CLPS, Advisor: Jim Anderson, 2010)
- J. Hynes (Neuroscience, Advisor: M. Paradiso, 2016)
- S. Guan (Neuroscience, Advisor: D. Sheinberg, expected 2016)
- B. Kent (CLPS, Advisor: Rebecca Burwell, 2015)
- J.H. Park (CLPS, Advisor: Steve Sloman, 2011)

- K. Rio (CLPS, Advisor: Bill Warren, 2014)
- T. Wiecki (CLPS, Advisor: Michael Franck, 2014)
- R. Xia (Neuroscience, Advisor: D. Sheinberg, expected 2016)

Misc graduate committees (first year project, prelim, thesis proposal) (10):

- C. Campanioli (CLPS, First year project, Advisor: Fulvio Domini)
- E. Cesanek (CLPS, First year project, Advisor: Fulvio Domini)
- G. Dachner (CLPS, First year project and Prelim, Advisor: Bill Warren)
- B. Kent (CLPS, First year project and Prelim, Advisor: Rebecca Burwell)
- J. Hynes (Neuroscience, Advisor: Michael Paradiso)
- K. Rio (CLPS, First year project and Prelim, Advisor: Bill Warren)
- Z. Page (CLPS, Prelim, Advisor: Bill Warren)
- T. Wiecki (CLPS, First year project and Prelim, Advisor: Mike Franck)
- T. Wirth (CLPS, First year project and Prelim, Advisor: Bill Warren)
- X. Yang (CLPS, First year project, Advisor: Russ Church)

Masters / international / visiting student advisees (15):

- A. Adoubib (ENST-Bretagne, France, summer 2015)
- O. Boisard (Université de Bourgogne, summer 2015)
- J. Brochard (ENS, France, 2014)
- M. Cauchoix (CNRS, France, 2010 & 2011)
- R. Danillo (Université de Bretagne Sud, France, 2014)
- E. Garrote (University of the Basque Country, Spain, 2010)
- G. Irwin (Osnabrueck University, Germany, 2012)
- H. Kuehne (Karlsruhe, Germany, 2010)
- K. Lee (KAIST, S. Korea, 2012)
- J.P. Noel (Gustavus Adolphus College, MN, summer 2012)
- K. Olfer (Leiden University, Netherlands, 2010 & 2012)
- P. Sailamul (KAIST, 2012)
- A. Singh (Cambridge University, 2016)
- M. Spector (CLPS, 2013–2014)
- T. Stemmler (Bremen University, Germany, 2010)
- S. Zhang (Harbin Institute of Technology, China, 2012)

Undergraduate honors thesis students (9):

- J. Cader (Independent concentration, 2016)
- R. Feinman (Applied Math, 2015)
- J.K. Kim (Independent concentration, 2014)
- R. Martens (CLPS, 2014)
- Z. Nado (Computer Science, 2016)
- S. Parker (Neuroscience, 2015)
- G. Riesen (Cognitive neuroscience, 2012). Departmental award.
- E. Sanford (Neuroscience, 2012)

- S. Shahamatdar (Bio-engineering, 2013)

Undergraduate research assistant advisees (31):

- A. Cheng (2016–)
- G. Chien (2016–)
- M. Dixon (Jan. 2012)
- N. Fulwiler (2012–2014)
- M. Hotta (2010)
- M. Holland (2015)
- R. Katipally (summer 2011)
- J.K. Kim (2011–2014)
- K. Kwon (2011)
- M. Le (2011)
- B. Lichtner (2011, UTRA)
- P. Mans (2011)
- R. Martins (2012–2014)
- M. McGill (2012, UTRA)
- C. Mentus (2012)
- R. McVerry (2012)
- Z. Nado (2012–present)
- T. Nguyen (2015–2016)
- C. Olsson (2013–2014)
- S. Parker (2013–2014)
- D. Perlmutter (2011)
- J.S. Kim (2014)
- G. Riesen (2010–2011, UTRA)
- C. Rotger (2015)
- E. Sanford (2011, UTRA)
- S. Sim (2014, UTRA)
- M. Song (2015)
- K. Spindler (2012)
- Y. Wang (RISD, 2014)
- M. Winter (2016–)
- D. Vagner (2011)
- G. Yauney (2014)