

Jorge Aurelio Menéndez

Curriculum Vitæ (November 13, 2019)

Address

Gatsby Computational Neuroscience Unit
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Personal website

<https://jamenendez11.github.io/>

RESEARCH EXPERIENCE

Gatsby Computational Neuroscience Unit & Sainsbury Wellcome Centre (London) 2016-

Prof. Peter Latham & Dr. Adam Kampff

- Doctoral research on recurrent neural network models of motor control and learning.

Methods in Computational Neuroscience Summer School (Woods Hole, MA) August, 2018

Prof. Haim Sompolinsky & Dr. Stephane Deny

- Research on recurrent network dynamics for linear classification as a model of the olfactory system.

Cortex Lab, UCL Institute of Ophthalmology (London, UK)

May-August, 2016

Prof. Matteo Carandini & Prof. Kenneth Harris

- Research on orientation selectivity and response adaptation of neurons in mouse primary visual cortex
- Analysis of calcium imaging data from several types of cortical neurons responding to visual stimuli

Kampff Lab, Sainsbury Wellcome Centre (London, UK)

April-May, 2016

Dr. Adam Kampff

- Research on understanding functional consequences of motor cortical lesions in rats.
- Event-related analysis of electrocorticographic (ECoG) recordings from rat motor cortex.
- Behavioral analysis involving extracting events from video recordings using computer vision techniques

Gatsby Computational Neuroscience Unit (London, UK)

February-April, 2016

Prof. Peter Latham

- Research on neural computation in spiking networks using biological synapses
- Formal analysis and numerical simulation of excitatory/inhibitory spiking and non-spiking networks

UCL Department of Genetics, Evolution and Environment (London, UK) December-January, 2016

Prof. Andrew Pomiankowski & Dr. Alex Stewart

- Research on mechanistic models of random monoallelic expression
- Numerical simulation and analysis of stochastic gene networks

Visual Thinking Lab, Johns Hopkins University (Baltimore, MD)

2012-2015

Prof. Jonathan Flombaum & Prof. Justin Halberda

- Research on representations and algorithms underlying spatial working memory
- Analysis and statistical modelling of psychophysical data
- Designed, implemented, and administered psychophysical experiments with humans

Visual Electrophysiology Lab, Università Cattolica del Sacro Cuore (Rome, Italy) June-August, 2014

Prof. Benedetto Falsini

- Research on face perception in patients with macular degeneration
- Statistical analysis of psychophysical and focal cone electroretinography data
- Designed and wrote software for testing face recognition ability in hospital patients

PUBLICATIONS

5. Aitchison, L., **Menendez, J. A.**, Pouget, A., & Latham, P. E. (2018). Probabilistic Synapses. Under review.
4. Lopes, G., Nogueira, J., Dimitriadis, G., **Menendez, J. A.**, Paton, J. J., & Kampff, A. R. (2017). [A robust role for motor cortex](#). bioRxiv, 058917.

3. Menendez, J.A., Bae, G.Y., Wilson, C. & Flombaum, J.I. (2016). [Deriving configuration effects in spatial working memory from rational correspondence](#). *Manuscript in preparation*
2. Menendez, J.A. (2015). [Free Will and Transworld Identity in Leibniz's Metaphysics](#). *Prometheus Undergraduate Philosophy Journal*.
1. Gross, S., Chaisilprungraung, T., Kaplan, E., Menendez, J.A. & Flombaum, J.I. (2014). [Problems for the purported cognitive penetration of perceptual color experience and Macpherson's proposed mechanism](#). *Baltic International Yearbook of Cognition, Logic and Communication*, 9(1), 6.

CONFERENCE PRESENTATIONS

* PDFs of slides/proceedings papers/posters can be found on my personal website (see above)

9. Menendez, J.A. (2019, November). *A motor cortical model of brain-machine interface learning, fast and slow*. **Talk** presented at Janelia Junior Scientist Workshop on Theoretical Neuroscience, Washington DC, USA.
8. Menendez, J.A., Latham, P.E. (2019, September). *Learning low-dimensional inputs for brain-machine interface control: a motor cortical model of brain-machine interface learning, fast and slow*. **Poster** presented at Bernstein Annual Meeting, Berlin, Germany.
7. Menendez, J.A., Latham, P.E. (2019, March). *Learning low-dimensional inputs for brain-machine interface control*. **Poster** presented at COSYNE Annual Meeting, Lisbon, Portugal.
6. Menendez, J.A., Latham, P.E. (2018, June). *Bayesian weight updates stabilize and improve local learning in a recurrent neural network*. **Poster** presented at Research in Encoding And Decoding of Neural Ensembles Conference, Firá, Santorini, Greece.
5. Menendez, J.A., Latham, P.E. (2017, November). *Computing with rates vs spikes: insights from two solutions to an integrator network*. **Poster** presented at the Society for Neuroscience Annual Meeting, Washington, DC, USA.
4. Menendez, J.A. (2016, February). *Towards a computational account of art cognition: unifying perception, visual art, and music through Bayesian inference*. **Talk** presented at the Human Vision and Electronic Imaging Conference, part of the IS&T International Symposium on Electronic Imaging, San Francisco, CA, USA.
3. Menendez, J.A., Falsini, B., Ambrosio, L., Corbo, G. (2015, May). *Predicting face recognition ability using macular focal cone electroretinography in patients with macular degeneration*. **Poster** presented at the Association for Research in Vision and Ophthalmology Annual Meeting, Denver, CO, USA.
2. Menendez, J.A., Bae, G.Y., Wilson, C., Flombaum, J.I. (2014, May). *Deriving configuration effects in spatial working memory from rational correspondence*. **Talk** presented at the Vision Sciences Society Annual Meeting, St. Pete Beach, FL, USA.
1. Menendez, J.A., Bae, G.Y., Wilson, C., Flombaum, J.I. (2013, November). *A computational basis for configuration effects in spatial working memory*. **Poster** presented at the Annual Workshop on Object Perception, Attention, and Memory, Toronto, ON, Canada.

TEACHING

Computational Cognitive Neuroscience Summer School
Teaching Assistant

July '19

Taught tutorials on linear algebra, statistical inference, neural coding, deep learning, and reinforcement learning to 30 students with a range of experimental and theoretical backgrounds in neuroscience and psychology. Most teaching materials for these are available on my personal website. Additional responsibilities included supervising six student projects.

COSYNE Tutorial by Prof. Wei Ji Ma on Bayesian Models of Behavior March '19
Teaching Assistant

Guided tutorial attendees through the exercises and answered questions about the lecture.

Systems and Theoretical Neuroscience Oct '17 - April '18
Teaching Assistant

Joint SWC-Gatsby course for first-year graduate students. As this was the first time this course was being run jointly with the SWC, I formed part of the working group that designed the lecture schedule with Adam Kampff and Maneesh Sahani. Responsibilities during the course included writing homework assignments, teaching tutorials, and marking papers.

Probabilistic and Unsupervised Learning and Approximate Inference in Probabilistic Models Oct - Dec '17
Teaching Assistant

Maneesh Sahani's course on graphical models and methods for approximate inference. Responsibilities included teaching tutorials and marking assignments.

SWC-Gatsby Induction Week Crash-Course Sept '17
Lecturer

Co-designed and lectured in a week-long crash-course on basic mathematics and neuroscience to prepare first-year graduate students from the SWC and Gatsby PhD programs for the aforementioned Systems and Theoretical Neuroscience course. Lectured on fundamentals of linear algebra (lecture notes can be found on my website).

ACADEMIC SERVICE

Reviewing:

- NeurIPS 2019
- PLOS Computational Biology

Workshops and meetings organized:

- March '19: **COSYNE 2019 Workshop: *Data, Dynamics and Computation: using data-driven methods to ground mechanistic theory***
Co-organizer of accepted COSYNE workshop on understanding computation in the brain using mechanistic and statistical models of network dynamics.
- Sept '18: **Symposium: *Cross-Species Conversations***
Lead organizer of the third *Systems Seminars* event at the Sainsbury Wellcome Centre. Invited speakers: Gilles Laurent, Suzana Herculano-Houzel, Marta Moita.
- Dec '17: **Symposium: *The Role of Naturalistic Behaviors in Neuroscience***
Co-organizer of the second *Systems Seminars* event Sainsbury Wellcome Centre and served as moderator for the panel discussion. Invited speakers: Matteo Carandini, Christian Machens, Megan Carey.
- March '17: **Symposium: *The Purpose of Neuronal Diversity in the Brain***
Co-founded the SWC/Gatsby PhD Student-run *Systems Seminars* series and helped organize the inaugural event. Invited speakers: Tom Mrsic-Flogel, Oscar Marin, Peter E. Latham.

COMMUNITY OUTREACH

- October '19: **Talk: *Brain-machine interface learning, fast and slow: a motor cortical circuit model of learning inside and outside the neural manifold***
Talk at UCL PhDs in Systems Neuroscience (UPSyNe) Society bimestrial meeting.
- May '19: **TEDx Goodenough College: *eQuality***
Speaker manager for independently organized TEDx event at Goodenough College, London. Was responsible for helping develop the talks of two speakers ([Peter Kaznacheev](#) and [Manfredi San Germano](#)), through weekly rehearsals and meetings over the course of eight weeks.
- June '18: **Invited talk: *The blind electrician: how neurons learn from experience***
Invited talk given at an event hosted by the Society of Spanish Researchers in the United Kingdom

AWARDS AND FUNDING

<i>COSYNE Travel Grant</i>	\$1000	2019
<i>Boehringer Ingelheim Fonds Travel Grant</i> (for summer school)	€2380	2018
<i>CoMPLEX MRes Thesis Award</i>	£150	2016
<i>UCL Graduate Research Scholarship</i>	~£17k/yr	2015-19
<i>UCL Overseas Research Scholarship</i> (covers overseas tuition fees)	~£24k	2015-16
<i>Rhodes Scholarship Finalist</i> , 5th District		2015
<i>Johns Hopkins University Cognitive Science Award</i>	\$500	2015
<i>Barry Goldwater Scholarship</i>	\$7500	2014
“A Computational Basis for Context Effects in Spatial Working Memory”		
<i>Luigi Burzio Undergraduate Research Award in Psychological and Brain Sciences</i>	\$3000	2012-14
“Deriving Configuration Effects in Spatial Working Memory from Rational Correspondence” (Supervisor: J.I. Flombaum)		
<i>Second Decade Society Summer Internship Grant</i>	\$2000	2014
“Psychophysical Testing of Retinal Disease Patients” (Supervisor: B. Falsini)		

EDUCATION

PhD Computational Neuroscience	2016-
<i>University College London, Gatsby Computational Neuroscience Unit & Sainsbury-Wellcome Center for Neural Circuits and Behaviour, as part of the CoMPLEX PhD program</i>	
Supervisors: Peter Latham & Adam Kampff	
Methods in Computational Neuroscience Summer School	August, 2018
<i>Marine Biological Laboratory</i>	
Course project supervisor: Haim Sompolinsky	
MRes Modelling Biological Complexity	2015-2016
<i>University College London, Centre of Mathematical and Physical Science in Life Sciences and Experimental Biology (CoMPLEX)</i>	
Graduated with Distinction	
Award for best MRes thesis	
Thesis: Contextual processing in mouse visual cortex (supervised by M. Pachitariu & M. Carandini)	
Rotation projects and thesis pdf available at http://www.ucl.ac.uk/~ucbpjam/mres.html	
BA Cognitive Science	2011-2015
<i>Johns Hopkins University</i>	

Graduated with General Honors and Departmental Honors (GPA: 3.93/4.00)
Focal areas: Computational Approaches to Cognition and Cognitive Psychology
Minor: Philosophy, with focus in Philosophy of Mind and Formal Logic

BM Classical Guitar Performance

2011-2015

Peabody Institute of The Johns Hopkins University

Graduated with Honors (GPA: 3.93/4.00)

Studied under Grammy-award winning classical guitarist Manuel Barrueco

Recitals are recorded and can be seen on YouTube: [Junior Recital](#), [Senior Recital](#)

International Baccalaureate (IB) Diploma

2009-2011

Washington International School

Final IB Score: 41/45

IB Higher Levels: Mathematics (7/7), Biology (7/7), Chemistry (7/7)

IB Standard Levels: English (6/7), Spanish (6/7), Economics (7/7)

IB Extended Essay: *Musically Enhanced Working Memory in Musicians and Non-Musicians*

SKILLS

- Programming: Python, MATLAB, R, HTML
- Languages: Spanish, English (fluent); French, Italian (proficient)