Jorge Aurelio Menéndez

Curriculum Vitæ (January 21, 2020)

Address	Gatsby Computational Neuroscience Unit
	25 Howland Street, London, W1T 4JG, UK
email	jorge.menendez.15@ucl.ac.uk
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, implementated, 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)

10. Menendez, J.A., Latham, P.E. (2020, March). *A motor cortical model of brain-machine interface learning, fast and slow.* **Poster** presented at COSYNE Annual Meeting, Denver, CO, USA.

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

COSYNE Tutorial by Dr. Ann Hermundstad on Normative approaches to understanding neural coding and behavior March '20

Teaching Assistant

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

Computational Cognitive Neuroscience Summer School July '19

Teaching Assistant

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 in-class 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:
— Cosyne 2020
— 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 Sainsubry 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 Sainsubry 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

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

EDUCATION

PhD Computational Neuroscience 2016-
University College London, Gatsby Computational Neuroscience Unit & Sainsbury-Wellcome Center for Neural Circuits and Behaviour, as part of the CoMPLEX PhD program
    Supervisors: Peter Latham & Adam Kampff

Methods in Computational Neuroscience Summer School August, 2018
Marine Biological Laboratory
    Course project supervisor: Haim Sompolinsky

MRes Modelling Biological Complexity 2015-2016

University College London, Centre of Mathematical and Physical Science in Life Sciences and Experimental Biology (CoMPLEX)

    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

Johns Hopkins University

    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, Engish (fluent); French, Italian (proficient)