Madineh **Sedigh-Sarvestani**

Post-doc Fellow · Max Planck Florida Institute for Neuroscience

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Education

Summer Workshop on Dynamic Brain	*Friday Harbor*
	Aug 2016
Computational Neuroscience in Vision	*CSHL Labs*
	July 2014
PhD Biomedical Engineering	*Penn State University*
	Aug 2013
BS Engineering	*Harvey Mudd College*
	May 2005

Research Experience

Max Planck Florida Institute for Neuroscience   *PI: David Fitzpatrick*

Post-doc Fellow   *2018 - present*

- Chronic calcium imaging in awake tree shrews to study the functional organization of visual cortex.

University of Pennsylvania   *PI: Diego Contreras*

Post-doc Fellow   *2014 - 2017*

- Electrophysiology in anesthetized cats to study thalamocortical circuits in the visual system.
- Evolution of epileptiform activity in the cat visual cortex.

Penn State University   *PI: Bruce Gluckman*

Graduate Student   *2008-2014*

- Modeling of sleep and epilepsy circuits, algorithm development for automated sleep and seizure classification.
- Chronic recordings in freely moving rodents to study sleep and seizure relationship.

Walter Reed Army Institute of Research

Research Engineer I   *2007-2008*

- Algorithm development for automated seizure classification.

Biostar West

Research Associate   *2005-2007*

- Hydrogel design for functional differentiation of stem cells.

Awards & Funding

Max Planck Florida Post-doctoral Travel Fellowship	*2022*
NIH-NEI Small Conference Grant (R13)	*2020-22*
NIH-NEI Post-doctoral training fellowship (F32)	*2015-19*
COSYNE Travel grant	*2015,2016*
Travel grant for Gordon Conference on Thalamocortical Interactions	*2016*
NIH-NINDS Pre-doctoral training fellowship (F31)	*2010-2013*
Best Poster Award at 6th International Workshop on Seizure Prediction	*2013*
Best Poster Award at 4th International Workshop on Seizure Prediction	*2009*

Publications

What & Where: Location-dependent feature sensitivity as a canonical organizing principle of the visual system.

M Sedigh-Sarvestani, D Fitzpatrick.

Frontiers in Neural Circuits

16, 834876, 2022

DeBruyn and Casagrande manuscripts on tree shrew retinal ganglion cells as a basis for cross-species retina research.

T Norton, E Savier, **M Sedigh-Sarvestani**.

Visual Neuroscience

39, E001, 2022

Sinusoidal transformation of the visual field is the basis for periodic maps in V2.

M Sedigh-Sarvestani, KS Lee, R Satterfield, N Shultz, D Fitzpatrick.

Neuron

109 (24): 4068-4079.e6, 2021

A bright future for the tree shrew in neuroscience research: Summary from the inaugural Tree Shrew Meeting.

E Savier, **M Sedigh-Sarvestani**, R Wimmer, D Fitzpatrick.

Zoological Research

42(4): 478-81, 2021

Neuromatch Academy: Teaching Computational Neuroscience with global accessibility.

T van Viegen, A Akrami, K Bonnen, E DeWitt, A Hyafil, H Ledmyr, GW Lindsay, P Mineault, JD Murray, XPitkow, A Puce, **M Sedigh-Sarvestani**, C Stringer, T Achakulvisut, E Alikarami, MS Atay, E Batty, JC Erlich, BV Galbraith, Y Guo, AL Juavinett, MR Krause, S Li, M Pachitariu, E Straley, D Valeriani, E Vaughan, M Vaziri-Pashkam, ML Waskom, G Blohm, K Kording, P Schrater, B Wyble, S Escola, MAK Peters

TiCS

25(7):535-538, 2021

Thalamocortical synapses in the cat visual system are weak and unreliable.

M Sedigh-Sarvestani, LA Palmer, D Contreras.

eLife

e41925, 2019.

Inhibition in simple cell receptive fields is broad and OFF-subregion biased.

M.M. Taylor, **M Sedigh-Sarvestani**, LA Palmer, D Contreras.

J Neurosci

38(3):595-612, 2018.

Spatiotemporal evolution of focal epileptiform activity from surface and laminar field recordings in cat neocortex.

H. Bink, **M Sedigh-Sarvestani**, I Fernandez-Lamo, L Kini, H Ung, D Kuzum, F Vitale, B Litt, D Contreras.

J Neurophysiol

119(6):2068-81, 2018.

Intracellular, in vivo, dynamics of thalamocortical synapses in visual cortex.

M Sedigh-Sarvestani, L Vigeland, I Fernandez- Lamo, MM Taylor, LA Palmer, D Contreras.

J Neurosci

37(21):5250-5262, 2017.

Seizures and brain regulatory systems: Consciousness, sleep, and autonomic systems.

M Sedigh-Sarvestani, H Blumenfeld, T Loddenkemper, LM Bateman.

J Clin Neurophysiol

32(3):188-93, 2015.

α2-adrenergic stimulation of the VLPO destabilizes the anesthetic state.

HS McCarren, MR Chalifoux, B Han, JT Moore, QC Meng, N Baron-Hionis, **M Sedigh-Sarvestani**,D Contreras, SG Beck, MB Kelz.

J Neurosci

34(49): 16385-16396, 2014.

Second order receptive field properties of simple and complex cells support a new standard model of thalamocortical circuitry in V1.

M Sedigh-Sarvestani, I Fernanzdez-Lamo, A Jaegle, MM Taylor.

J Neurosci

34(34):11177-9, 2014.

REM sleep precedes seizure onset in the TeTX model of temporal lobe epilepsy.

M Sedigh-Sarvestani, GI Thuku, SJ Schiff, SL Weinstein, BJ Gluckman.

J Neurosci

34(4):1105-14, 2014.

Reconstructing mammalian sleep dynamics with data assimilation.

M Sedigh-Sarvestani, SJ Schiff, BJ Gluckman.

PLoS Comp Biol

8(11):e1002788, 2012.

Data assimilation of glucose dynamics for use in the intensive care unit.
M Sedigh-Sarvestani, DJ Albers, BJ Gluckman.

IEEE Eng Med Biol Soc
Conf Proceedings, 2012.

Analyzing large data sets acquired through telemetry from rats exposed to organophosphorous compounds.
M De Araujo Furtado, A Zheng, **M Sedigh-Sarvestani**, L Lumley, S Lichtenstein, D Yourick.

J Neurosci Meth
184(1):176-83, 2009.

Invited Talks

Bernstein Conference, Major transitions in cortical circuit evolution Workshop (Berlin, Germany). Novel topographic patterns in tree shrew visual cortex.

Sept 2022

Animal Behavior Society, Presidential Symposium (Virtual). Re-integrating the body as a component of the visual system.

July 2022

University of Rochester (Virtual). Briggs Lab. How embodied visual experience shapes visual circuits.

Jan 2022

University of Oxford/World-Wide Neuro (Virtual). Cortex Club. A novel form of retinotopy in area V2 highlights location-dependent feature selectivity in the visual system.

Jan 2022

University of Virginia (Virtual). Department of Psychology Journal Club. What and Where: Location-dependent feature sensitivity in the visual system.

Dec 2021

Monash University (Virtual). Sensory and Systems Neuroscience Group Seminar. A sinusoidal transformation of the visual field is the basis for striped maps in V2.

Mar 2021

Vanderbilt University (Virtual). Neuroscience Brown Bag Seminar. A sinusoidal transformation of the visual field is the basis for striped maps in V2.

Feb 2021

Allen Institute (Virtual). Organization of higher order visual areas.

Feb 2021

University College London (Virtual). BehavioNeuro Talks. Organization of higher order visual areas.

Dec 2020

University of Miami (Virtual). 4th Annual Neural Engineering Symposium. A sinusoidal transformation of the visual field.

Oct 2020

Weill Cornell Medicine (Virtual). Frontiers in Neuroscience Seminar Series. Rethinking maps in the visual system.

Sept 2021

University of Alabama. Vision Science Research Center Visiting Scholars Program Seminar . Specialized visuotopic maps anchor the functional organization of higher visual areas.

Jan 2020

University of Virginia. Cang Lab. Extrastriate visual system of the tree shrew.

June 2019

Society for Neuroscience. Hosted by Thomas Recording. Characterizing the thalamocortical circuit in the cat visual cortex.

Oct 2017

University of Pennsylvania. Small Circuits and Behavior Meeting. Understanding thalamocortical circuitry in the early visual pathway.

Aug 2014

Contributed Talks

From Neuroscience to Artifically Intelligent Systems (NAISys @ CSHL). What we lose by modeling the visual system without topographic maps.

April 2022

COSYNE 2021 (Virtual). Sinusoidal transformation of the visual field on the cortical surface.

Feb 2021

Teaching and Organizing

Lead organizer for Tree Shrew Discovery Meeting *2020-present*

Chief Instructions Officer, Neuromatch Academy *2021*

Executive Committee Member, Neuromatch Academy *2020*

Co-Instructor, CSHL Neural Data Science Summer Course *2019*

TA, CSHL Neural Data Science Summer Course *2015,17*

SAT tutor: Summit Education (Maryland) and Ivy Tutoring (Los Angeles) *2005-2008*

Mentoring and Outreach

Networking Session Invited Panelist. Network for Women in Science (NWIS), a mentoring and networking group led by scientists from Max Planck Florida Institute for Neuroscience, the Scripps Research Institute, and Florida Atlantic University *June 2022*

Neuromatch Academy. NMA is a volunteer-run globally accessible virtual summer school in computational neuroscience that has served 5000+ students. In 2020, I contributed to content development. In 2021, I led the team responsible for hiring and training 400 TAs. In 2022, I contributed to evaluation and training of TAs and contributed to a session on diversity and inclusion in neuroscience. Outside the summer school, I mentor several NMA students in Iran and Europe. *2020-present*

Max Planck Florida. I'm involved in several institute and community based initiatives at MPFI. In 2018, I was the supervisor for Solana Liu, a post-bac student and Saige Drecksler, a high-school student and have served as the post-doc mentor for graduate students at the institute. I've also given several public science talks, including one at the local high school, and have participated in many outreach efforts in the community. *2018-present*

Philadelphia Charter Schools. During the school year, I served as the science mentor for 6th and 7th grade students in Belmont Academy. During weekly class-room visit, I would work with the kids on their science fair projects. I also served as a science fair judge for the school district of Philadelphia. *2014-17*