# Madineh Sedigh-Sarvestani

■ msarvestani@gmail.com | 💣 msarvestani.com

### 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

2018 - present

# Research Experience \_\_\_\_\_

#### **Max Planck Florida Institute for Neuroscience**

PI: David Fitzpatrick

POST-DOC FELLOW

• 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.

Visual Neuroscience

39, E001, 2022

T NORTON, E SAVIER, M SEDIGH-SARVESTANI.

inaugural Tree Shrew Meeting.

Neuron

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

A bright future for the tree shrew in neuroscience research: Summary from the

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

M SEDIGH-SARVESTANI, KS LEE, R SATTERFIELD, N SHULTZ, D FITZPATRICK.

Zoological Research

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

42(4): 478-81, 2021

Neuromatch Academy: Teaching Computational Neuroscience with global accessibility.

**TiCS** 

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

25(7):535-538, 2021

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

M SEDIGH-SARVESTANI, LA PALMER, D CONTRERAS.

e41925, 2019.

eLife

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.

J Neurophysiol

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

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.

lpha2-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.

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	J Neurosci Meth
organophosphorous compounds.  M De Araujo Furtado, A Zheng, <b>M Sedigh-Sarvestani</b> , L Lumley, S Lichtenstein, D Yourick.	184(1):176-83, 2009.
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	
<b>Networking Session Invited Panelist.</b> 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
<b>Neuromatch Academy.</b> 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
<b>Max Planck Florida.</b> 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
<b>Philadelphia Charter Schools.</b> 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
Invited Talks	
<b>Animal Behavior Society, Presidential Symposium (Virtual).</b> Re-integrating the body as a component of the visual system.	July 2022
<b>University of Rochester (Virtual).</b> Briggs Lab. How embodied visual experience shapes visual circuits.	Jan 2022
<b>University of Oxford/World-Wide Neuro (Virtual).</b> Cortex Club. A novel form of retinotopy in area V2 highlights location-dependent feature selectivity in the visual system.	Jan 2022

<b>University of Virginia (Virtual).</b> Department of Psychology Journal Club. What and Where: Location-dependent feature sensitivity in the visual system.	Dec 2021
<b>Monash University (Virtual).</b> Sensory and Systems Neuroscience Group Seminar. A sinusoidal transformation of the visual field is the basis for striped maps in V2.	Mar 2021
<b>Vanderbilt University (Virtual).</b> 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
<b>University College London (Virtual).</b> BehavioNeuro Talks. Organization of higher order visual areas.	Dec 2020
<b>University of Miami (Virtual).</b> 4th Annual Neural Engineering Symposium. A sinusoidal transformation of the visual field.	Oct 2020
<b>Weill Cornell Medicine (Virtual).</b> Frontiers in Neuroscience Seminar Series. Rethinking maps in the visual system.	Sept 2021
<b>University of Alabama.</b> 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
<b>Society for Neuroscience.</b> Hosted by Thomas Recording. Characterizing the thalamocortical circuit in the cat visual cortex.	Oct 2017
<b>University of Pennsylvania.</b> Small Circuits and Behavior Meeting. Understanding thalamocortical circuitry in the early visual pathway.	Aug 2014

# Contributed Talks\_\_\_\_\_

<b>From Neuroscience to Artifically Intelligent Systems (NAISys @ CSHL).</b> 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