

Na Young Jun

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Employment

Meta Reality Labs

RESEARCH SCIENTIST INTERN (CTRL TEAM) - COMPUTATIONAL MODELING

- Built machine learning models for EMG-based neuromotor interfaces

Burlingame, CA
May 2022 - Aug 2022

Neuromatch Academy Deep Learning

LEAD TEACHING ASSISTANT

- Taught various topics on deep learning to professors, postdocs, and grad students, and led discussion sessions.

Global
2021

Education

Duke University

PH.D. IN NEUROBIOLOGY (EXPECTED DEC 2022, GPA 3.84/4.00)

M.S. IN COMPUTER SCIENCE (EN-ROUTE, GPA 3.95/4.00)

Durham, NC
Aug 2017 - Dec 2022

Yale University

M.S. IN BIOENGINEERING (GPA 3.63/4.00, RECEIVED MOGAM SCIENCE FOUNDATION SCHOLARSHIP)

New Haven, CT
Aug 2014 - May 2015

Korea University

B.S. IN LIFE SCIENCES (GPA 3.60/4.00, RECEIVED KOREA UNIVERSITY ACADEMIC SCHOLARSHIP)

STUDENT EXCHANGE AT UNIVERSITY OF WISCONSIN-MADISON (RECEIVED MIRAE ASSET SCHOLARSHIP)

Seoul, S. Korea
Mar 2009 - July 2014

Selected Publications

Efficient coding, channel capacity, and the emergence of retinal mosaics

NA YOUNG JUN, GREG D. FIELD, JOHN PEARSON IN *NEURIPS*

2022

Scene statistics and noise determine the relative arrangement of receptive field mosaics

NA YOUNG JUN, GREG D. FIELD, JOHN PEARSON IN *PNAS*

2021

Inter-Mosaic Coordination of Retinal Receptive Fields

SUVA ROY, NA YOUNG JUN, EMILY DAVIS, JOHN PEARSON, GREG D. FIELD IN *NATURE*

2021

Bubblewrap: Online tiling and real-time flow prediction on neural manifolds

ANNE DRAELOS, PRANJAL GUPTA, NA YOUNG JUN, CHAICHONTAT SRIWORARAT, JOHN PEARSON, IN *NEURIPS*

2021

Coordinated multiplexing of information about separate objects in visual cortex

NA YOUNG JUN, DOUGLAS A RUFF, LILY E. KRAMER, BRITTANY BOWES, SURYA T TOKDAR, MARLENE R COHEN, JENNIFER M GROH, IN *BIORXIV (UNDER REVIEW)*

2019

Channelrhodopsin Variants Engage Distinct Patterns of Network Activity

NA YOUNG JUN AND JESSICA A. CARDIN, IN *ENEURO*

2018

Conference Presentations

Efficient Coding of Natural Movies Predicts the Optimal Number of Receptive Field Mosaics

NA YOUNG JUN, GREG FIELD, JOHN PEARSON IN *COSYNE*

2022

The Influence of noise and information non-uniformity on the efficient coding of natural scenes

NA YOUNG JUN, GREG FIELD, JOHN PEARSON IN *COSYNE*

2020

Fluctuating Activity (Time-Division Multiplexing) Varies Across Sensory Brain Regions

NA YOUNG JUN, JEFF MOHL, MARLENE COHEN, SURYA TOKDAR, JENNIFER GROH, IN *SOCIETY FOR NEUROSCIENCE*

2018

Optogenetic Tools With Varying Kinetics Differentially Engage Intrinsic Network Resonance *In Vivo*

NA YOUNG JUN AND JESSICA A. CARDIN, IN *SOCIETY FOR NEUROSCIENCE*

2016

Invited Talks

Efficient coding of natural scenes predicts the optimal number of receptive field mosaics and their spatial arrangements.

HUMAN-POWERED HEALTHCARE WEBINAR SERIES, KAIST

Daejeon, Korea
2022

The optimal spatial arrangement of ON and OFF receptive fields

PHYSIOLOGY MONTHLY SEMINAR, SCHOOL OF MEDICINE, KOREA UNIVERSITY

Seoul, Korea
2022

Optimal Spatial Arrangement of ON and OFF Encoders in the Noisy World:

Under the Perspective of Information Efficiency

NEUROBIOLOGY GRADUATE STUDENTS SEMINAR, DUKE UNIVERSITY

Durham, NC
2020

Observe the Unobserved: Inferring Hidden Structure in Multilayer Neural Circuits

NEUROBIOLOGY GRADUATE STUDENTS SEMINAR, DUKE UNIVERSITY

Durham, NC
2018

Novel Optogenetic Tools for Probing Network Activity in the Intact Brain

BIOMEDICAL ENGINEERING MASTER'S GRADUATION TALK, YALE UNIVERSITY

New Haven, CT
2015

Research Experience

Field Lab (PI: Greg Field) & Pearson Lab (PI: John Pearson), Duke University

DOCTORAL THESIS RESEARCH

Durham, NC
Jul 2018 - Present

- Computational understanding of retinal information processing using deep learning networks and information theory.
- Built a model of the retina using neural networks, optimized using the efficient coding principle on natural video inputs.
- The model provides a unified perspective on the relationship between retinal mosaics, efficient coding, and channel capacity that may help to explain the stunning functional diversity of retinal mosaics.
- published multiple papers in Nature, PNAS, and NeurIPS.

Groh Lab (PI: Jennifer Groh), Duke University

FIRST YEAR PH.D. ROTATIONS

Durham, NC
Apr 2018 - Jun 2018

- Studied patterns of neural correlations and time-division multiplexing in visual cortex (V1, V4) with respect to the number of objects in the visual field.

Grill Lab (PI: Warren Grill), Duke University

FIRST YEAR PH.D. ROTATIONS

Durham, NC
Jan 2018 - Apr 2018

- Single-unit recordings of Parkinsonian Rat brain during DBS stimulation to understand how DBS affects brain plasticity.

Kay Lab (PI: Jeremy Kay), Duke University

FIRST YEAR PH.D. ROTATIONS

Durham, NC
Sep 2017 - Jan 2018

- Live-imaging of microglial function in the retina.

Demb Lab (PI: Jonathan B. Demb), Yale University

POSTGRADUATE RESEARCH ASSOCIATE

New Haven, CT
Jul 2015 - Aug 2017

- Characterized new cell types in the mouse retina based on their structure, function and gene expression.

Cardin Lab (PI: Jessica A. Cardin), Yale University

MASTER'S THESIS RESEARCH

New Haven, CT
Aug 2014 - May 2015

- Studied spontaneous and activated optogenetic tool-induced gamma oscillations in the mouse visual cortex *in vivo*.
- Injected several novel optogenetic tools (Chrimson, Chronos, SwiChR) and Channelrodopsin2 to the V1 cortex of mice brain and compared their *in vivo* activation, and conducted extracellular recording to compare spike rates and local field potential between mice with different optogenetic tools.

Advanced Computational Vision (Instructor: Steven Zucker), Yale University

CLASS FINAL PROJECT

New Haven, CT
Jan 2015 - May 2015

- Trained neural signal classifiers that distinguish between brain states (awake or anesthetized, moving or not moving, receiving visual stimuli or not) and which cortex layers the neural signal originated.

Skills

Programming

PyTorch, Python, MATLAB, Java, R

Biological Experiments

Electrophysiology (intracellular / extracellular neural recording), animal behavior, IHC