

Unit Name

Biological Nonlinear Dynamics Data Science Unit

Collaborations

Term 2 2023 - Ongoing

Misha Ahrens, Janelia HHMI, Ashburn, Virginia, USA, Zebrafish whole brain EDM

George Sugihara, Scripps Institution of Oceanography, UC San Diego, La, Jolla, California, USA, EDM in ecology

Sarah Luo, Astar, Singapore, EDM for Aging

Term 2 2025 - Ongoing

Hiroaki Natsukawa, Osaka Seikei University, Japan, Visualization for EDM

Weiping Han, Astar, Singapore, EDM for Aging

Term 1 2023 - Ongoing

William Frost, Rosalind Franklin University, North Chicago, Illinois, USA, Tritonia and Aplysia EDM analysis

Jun Wu, UT Southwestern, Dallas, Texas, USA, the early human embryo pluripotency

Yonkeun Paul Park, KAIST, South Korea, reflectin proteins and EDM for quantitative phase microscopy

Stanislav Smirnov, University of Geneva, Switzerland, mathematics of neuroscience

Masahito Ikawa, Osaka University, Japan, mammalian spermatogenesis epigenetics

Terrence Sejnowski, Salk Institute, UC San Diego, La, Jolla, California, USA, low dimensional manifolds and AI

Keichi Takahashi, Osaka University, Japan, High performance computing EDM algorithms

Jingwen Li, UCSD, La, Jolla, California, USA, EDM for Marmosets

Yoko Iwata, U of Tokyo, Japan, Cephalopod biology

Term 2 2024 - Ongoing

Nicholas Friedman, Museum of Nature Hamburg, Hamburg, Germany, OKEON soundscape analysis

Michael Yoo, CNIR, Institute for Basic Science, Suwon, South Korea, EDM for monkey electrophysiology

Term 3 2022 - Ongoing

Jack Gallant, UC Berkeley, Berkeley, California, USA, fMRI of human driving

Term 3 2023 - Ongoing

Loren Frank, UCSF, San Francisco, California, USA, embeddings of rat decision making

Caroline Wee, Astar, Singapore, EDM for Aging

Rosa So, Astar, Singapore, EDM for Aging

Term 1 2024 - Ongoing

Quan Zhu, UCSD, La, Jolla, California, USA, EDM from MERFISH

Term 3 2024 - Ongoing

Won Mok Shim, CNIR, Institute for Basic Science, Suwon, South Korea, EDM for fMRI of videogames

Hakwan Lau, CNIR, Institute for Basic Science, Suwon, South Korea, EDM for fMRI

Xiaomei Lu, NASA, USA, Antarctic Sea Ice LIDAR and temperature satellite observations

Mentorship / Supervision

Sep 2024 - Present	Mentor, Richa Agarwal, OIST Student Host (RI, SRS, VRS, VS), Viet Bach Nguyen, Research Intern Thesis Supervisor, Temma Fujishige, OIST Student
Jan 2024 - Present	Mentor, Anouk Beraud, OIST Student Thesis Supervisor, Iaroslav Korobov, OIST Student
Sep 2023 - Present	Third Committee Member, Juliana Silva, OIST Student
May 2023 - Present	Mentor, Kokila Dilhani Perera, OIST Student

Scholarly Contributions and Creative Productions

Conference Proceedings

Completed/Published

Camassa, A.; Park, J.; Wagner, M.; Sejnowski, T.; Pao, G. M. Multivariate Prediction of Human Behavior in Task fMRI. In *NeurIPS 2024 Workshop on Behavioral Machine Learning*, 2024.
<https://openreview.net/forum?id=TVZ3JairIX&nesting=2&sort=date-desc>

Journal Article

Completed/Published

Saberski, E.; Lorimer, T.; Carpenter, D.; Deyle, E.; Merz, E.; Park, J.; Pao, G.; Sugihara, G. The Impact of Data Resolution on Dynamic Causal Inference in Multiscale Ecological Networks. *Communications Biology* **2024**, 7.

Pao, G.; Park, J. C. Evidence for the Entry into a New State of the Antarctic Sea Ice Cycle Using Multi-Scale Generalized Takens Theorem Embeddings. *AGU24* **2024**.

Poster Presentation at Conference

Completed/Published

Pao, G. Experimentally Testable Brain Activity Manifolds to Behavior. *Neuro Artificial Intelligent systems* **2024**.

Pao, G. Experimentally Testable Mapping of Brain Activity to Behavior. *NAISYS, Cold Spring Harbor* **2024**.

Presentation at Conference

Completed/Published

Pao, G. Manifolds for Explainable Data Driven Science. *APPW* **2025**.

Pao, G. How Nature Computes with Geometry. *Biological Artificial and Quantum intelligence* **2025**.

Pao, G. Causation without Correlation in Neuroscience. *sensorimotor systems for limb control* **2024**.

Pao, G. Algorithms to Generically Map Brain Activity to Behavior. *Society for Neuroscience, Singapore* **2024**.

Seminars

Completed/Published

Pao, G. Causation without Correlation and Its Applications (center for Molecular Medicine, UCSD, Center for Epigenomics). **2024**.

Pao, G. Causation without Correlation in Biology (CNIR, Institute for Basic Science, South Korea). **2024**.

Pao, G. Algorithms to Generically Map Brain Activity to Behavior (Columbia University, USA). **2024**.

External Service

May 2024 - Present	NeurIPS Neuro-AI workshop program committee, NeurIPS foundation, program committee member for the Neuro AI Workshop 2024, Vancouver
Sep 2023 - Present	PNAS, USA NAS, reviewer for Proceedings of the National Academy of Sciences Neural Computation reviewer, Neural Computation Journal

Workshops and Seminars (Organized and Hosted by Faculty/Units)

Jan 2025	Thiparat Chotibut, Kenji Doya, Tomoki Fukai, Kunio Kashino, Yu Mu, Yoshifumi Nishi, Barry C Sanders, Mahito Sugiyama, Ryousei Takano, Hiroki Takesue, Taro Toyoizumi, Junichi Tsujii , Biological, Artificial, and Quantum Intelligence 2025 (BAQ2025), OIST (Lab4, E48 Seminar Room), Prof.Kae Nemoto and Prof.Bill Munro Michael Stryker, Presidential lecture, Sydney Brenner hall
May 2024	Dr.Quan ZHU, Associate Director, Epigenomics Center at UCSD(University of California San Diego), USA, Applying Spatially-Resolved Single Cell Technologies to Study Human Health and Diseases, OIST (Seminar Room C700, Lab3)