KOSIO BESHKOV

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PROFESSIONAL EXPERIENCE

Researcher

Faculty of Mathematics and Natural Sciences, Department of Biosciences • Universitetet i Oslo

September 2024 - Current Oslo, Norway

- Machine learning assisted de novo protein design.

Research Assistant

Cognitive Psychophysiology • Bulgarian Academy of Sciences-Institute of Neurobiology

September 2020 - August 2021 Sofia, Bulgaria

- Granger Causality analysis of EEG data.

EDUCATION

PhD ◦Marie Skłodowska-Cure Action Fellowship

Faculty of Mathematics and Natural Sciences, Department of Biosciences • Universitetet i Oslo

September 2021 - August 2024 Oslo, Norway

- Neural Representations and the Topology of Cognition. (Thesis)

Research Master of science in cognitive neuroscience

Radboud University, Donders Institute for Brain, Cognition and Behavior

September 2018 - July 2020 Nijmegen, the Netherlands

- Topological Characteristics of Neural Manifolds. (Thesis)

Bachelors in psychology

Sofia University

September 2014 - July 2018 Sofia, Bulgaria

INTERESTS

Mathematics
Topology, differential geometry and foundations.

Neuroscience
Neural coding, neural manifolds and visual processing.

Machine Learning
Deep learning theory, explainability and robustness.

LANGUAGES

Bulgarian
English
Spanish
Norwegian

Python Matlab PyTorch

PUBLICATIONS

Beshkov K. & Tiesinga P. (2022). Geodesic-based distance reveals nonlinear topological features in neural activity from mouse visual cortex. Biological cybernetics, 116(1), 53-68.

Beshkov K., Verhellen J. & Lepperød M. E. (2022). Isometric Representations in Neural Networks Improve Robustness. arXiv preprint.

Schoyen V. S., Beshkov K., Pettersen M. B., Hermansen E., Holzhausen K. ... & Lepperod M. E. (2024). Hexagons all the way down: Grid cells as a conformal isometric map of space. bioRxiv, 2024-02.

Beshkov K., Fyhn M., Hafting T. & Einevoll G. T. (2024). Topological structure of population activity in mouse visual cortex encodes densely sampled stimulus rotations. Iscience, 27(4).

Beshkov K. & Einevoll G. T. (2024). A rank decomposition for the topological classification of neural representations. arXiv preprint.

Verhellen J., Beshkov K., Amundsen S., Ness T. V. & Einevoll G. T. (2024). Multitask learning of a biophysically-detailed neuron model. PLOS Computational Biology, 20(7), e1011728.