Olesia Dogonasheva

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EDUCATION

École normale supérieure, Doctorale Cerveau, cognition, comportement (ED3C), Paris — 2024
PhD

HSE University, Psychology department, Moscow — 2023
PhD

Alferov University, Nanobiotechnology department, Saint-Petersburg — 2020
MD in Physics

ITMO University, Department of higher mathematics, Saint-Petersburg — 2015
BD in Applied Mathematics and Computer Science

COMPLEMENTARY EDUCATION

Bioinformatics Institute, Saint-Petersburg — 2020
Statistics, data analysis, machine learning, bioinformatics tools

Computer Science Center, Saint-Petersburg — 2012
Algorithms and data structures, C++

PUBLICATIONS

O. Dogonasheva, E. Postnikov, A. Lavrova "Shaping spiking patterns through synaptic parameters as revealed by conventional and wavelet-based bifurcation analysis", *The European Physical Journal Special Topics*, p. 1-13, 2023

O. Dogonasheva, D. Kasatkin, B. Gutkin, D. Zakharov "Multistability and evolution of chimera states in a network of type II Morris-Lecar neurons with asymmetrical nonlocal inhibitory connections", *Chaos: An Interdisciplinary Journal of Nonlinear Science*, vol. 32, no. 10, p. 101101, 2022

O. Dogonasheva, D. Kasatkin, B. Gutkin, D. Zakharov "Robust universal approach to identify travelling chimeras and synchronized clusters in spiking networks", *Chaos, Solitons and Fractals: the interdisciplinary journal of Nonlinear Science, and Nonequilibrium and Complex Phenomena*, vol. 153, p. 111541, 2021

PREPRINTS

O. Dogonasheva, D. Zakharov, A.L. Giraud, B. Gutkin "Deciphering the Rhythmic Symphony of Speech: A Neural Framework for Robust and Time-Invariant Speech Comprehension", *biorXiv*, 2024.

O. Dogonasheva, D. Radushev, B. Gutkin, D. Zakharov "Dynamical manifold dimensionality as characterization measure of chimera states in bursting neuronal networks", *arXiv:2311.17383*, 2023.

V. Tiselko, O. Dogonasheva, A. Myshkin, N. Khoroshavkina, O. Valba "K-clique percolation in human structural connectome", *arXiv:2210.07218*, 2022.

CONFERENCES

O. Dogonasheva, O.Platonova, D. Zakharov, A.L.Giraud, B. Gutkin "Rhythmically structured predictive coding enables invariant semantic recovery", *Cosyne*, Lisbon, Portugal, Feb 2023.

O. Dogonasheva, O.Platonova, D. Zakharov, A.L.Giraud, B. Gutkin "Brain-Rhythm-based Inference (BRyBI) for time-scale invariant speech processing", *Neuroscience (SfN)*, Washington, USA, Nov 2023.

O. Dogonasheva, D. Zakharov, A.L.Giraud, B. Gutkin "Hierarchical Oscillation as a Mechanisms for Speech Parsing", *Bernstein*, Berlin, Germany, Sep 2023.

O. Dogonasheva, D. Zakharov, A.L.Giraud, B. Gutkin "Delta-theta-gamma interplay for contextualized speech parsing", *32nd Annual Computational Neuroscience Meeting*, Leipzig, Germany, Jul 2023.

O. Dogonasheva, B. Gutkin, D. Zakharov "Correlation dimension as a measure of chimera states", *NoDycon*, Rome, Italy, Jun 2023.

O. Dogonasheva, D. Zakharov, B. Gutkin "Brain-Rhythm-based Inference (BRyBI) for time-scale invariant speech processing", *Cosyne*, Montreal, Canada, Mar 2023.

O. Dogonasheva, B. Gutkin, D. Zakharov "Identification of multistable coherent regimes in spiking neural networks", *Dynamics Day Europe*, Aberdeen, Scotland, UK, Aug 2022.

O. Dogonasheva, B. Gutkin, D. Zakharov “Calculation of travelling chimera speeds for dynamical systems with ring topologies”, *BF-NAICS 2021: Baltic Forum: Neuroscience, AI and Complex Systems*, Kaliningrad, Russia, Sep 2021.

O. Dogonasheva, B. Gutkin, D. Zakharov “Multistability of coherent states in ring networks of type II neurons with asymmetrical nonlocal inhibitory connectivity”, *30th Annual Computational Neuroscience Meeting*, Jul 2021.

O. Dogonasheva, B. Gutkin, D. Zakharov “A new universal approach for studying synchronization processes in networks of active elements based on adaptive synchronization measure”, *Nonlinear days 2021*, Saratov, Russia, Apr 2021.

O. Dogonasheva, G. Novikov, “A new method for the molecular geometry optimization during the quantum-chemical modeling of chemical and biochemical reactions”, *SPbOpen 2019*, Saint-Petersburg, Russia, Apr 2019.

O. Dogonasheva, I. Popov “Solution of spectral problems for quantum graphs with delta potentials of spiral types in a magnetic field”, *IV Congress of young scientists of Russia*, Saint-Petersburg, Russia, 2015.

O. Dogonasheva, I. Popov “DNA topology quantum graphs in a magnetic field”, *Mathematical Challange of Quantum Transport in Nanosystems*, Saint-Petersburg, Russia, 2014.

PATENTS

Patent for a computer program No. 2022684705, 2022
Software package for the identification of dynamical regimes in spiking neural networks

Patent for a computer program No. 2022684101, 2022
Software package for calculation of the chimera state speed in spiking neural networks

Patent for a computer program No. 2021616670, 2021
Software package for automatic simulation of chemical reactions networks during the deposition of molecular coatings on surfaces

Patent for a computer program No. 2020615220, 2020
Software package ReaNet for automatic modeling of thermal chemical and photochemical reactions

AWARDS & SCHOLARSHIPS

Vernadsky Fellowship Award, 2021-2024
Ambassadeur de France en Russie

Idea Foundation Fellowship, 2021-2023
Research Center ”IDEAS”

Stipendium, 2020
Freien Universität Berlin, Germany

Winner of the competition “Start - Digital Technology”, 2020
Innovation Promotion Fund, Moscow, Russia

Prizewinner in the “International gemini Mars design competition”, 2016
The Mars society, USA

SCHOOLS & INTERNSHIPS

Bio-inspired deep learning, 2024
Workshop on Simulation-Based Inference (SBI) in Mainz, Germany

Neurobridges, 2022
Scientific School in Cluny, France

Mathematics, Theoretical Physics and Mathematical Methods of Data Analysis in Neuroscience, 2021
Scientific School in Sirius Mathematics Center, Sochi, Russia

Neuromatch Academy, 2020
Summer school in Computational Neuroscience

Bioinformatics Summer School, 2019
MIPT, Moscow, Russia

INVITED TALKS

LaCNS Group, the Donders Centre for Cognitive Neuroimaging, Radboud University, 2023
“Brain-Rhythms-Based Inference (BRyBI) model for Contextualized Speech Parsing”

Institute of Radio-engineering and Electronics RAS, Saratov, Russia, 2020
"Travelling chimera states in the ring of II-type Morris-Lecar neurons with asymmetric nonlocal inhibitory connections"

TEACHING EXPERIENCE

HSE University, Moscow 2021 – 2022

- Advanced Calculus, assistance
- Theoretical neuroscience, seminars
- Brain and Mind, seminars

ITMO University, Saint-Petersburg 2014 – 2017

- Higher mathematics, 3-terms course
- Probability theory and mathematical statistics, 2-terms course

RESEARCH EXPERIENCE

École Normale Supérieure, Paris 2022 – 2024

- Study brain rhythms influence on speech coding

Higher School of Economics, Moscow 2020 – 2022

- Study synchronization processes and chimera states in spiking neural networks

Skoltech, Moscow 2020

- Discovery of allosteric binding site in G protein-coupled receptors

Bioinformatics Institute, Saint-Petersburg 2019

- Phenome-wide functional analysis of human genetic association data

Alferov University, Saint-Petersburg 2018 – 2020

Researcher, Nanobiotechnology laboratory

- Development of optimization algorithms to automatic search of chemical reaction pathways
- Implementation of a genetic algorithm for the amino acid substitutions selection in the chromophore to increase the absorption coefficient
- Implementation of machine learning algorithms to optimize force field parameters

ITMO University, Saint-Petersburg 2014 – 2017

Assistant, Department of higher mathematics

- Solving spectral problems for spiral-type quantum graphs

Scientific Center for Robotics and Technical Cybernetics, Saint-Petersburg 2014 – 2015

Technician, Mathematical modelling department

- Solution for the inverse kinematics problem for a six-chain robot manipulator
- Ice dynamics modelling as a part of the project of rescue robots on the oil platforms

REFERENCES

- **Professor Boris Gutkin**
  Director of Research at the Centre National pour la Recherche Scientifique (CNRS) France,
  Director, Group for Neural Theory, Laboratoire de Neuroscience Cognitive, INSERM U960, DEC, ENS
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