

Dmitrii Altukhov

ML RESEARCH ENGINEER · PHD (COMPUTER SCIENCE)

Amsterdam, The Netherlands

 [dmlt](#) |  [dmitrii-altukhov-258b05233](#) |  altukhov.dm@gmail.com |  +316 136 36 770

Profile

I specialize in software engineering and data science with 8-years experience building data analysis algorithms. I'm passionate about programmer's craft, code quality and tools behind it, while having a strong background in **machine learning**, **statistical analysis** and **linear algebra**.

I mostly write code in **Python** but also have experience with **C/C++**, **Java** and **MATLAB**.

Experience

Artificial Intelligence Research Institute (AIRI)

Moscow, Russia

RESEARCH FELLOW

Feb. 2022 – Apr. 2023

- Built and trained deep learning model to predict speech from MEG data in **PyTorch**, [meg_speech_decoding on github](#)
- Developed real-time pipeline for EEG timeseries analysis using **Python**
- Developed a **Python** library for type-safe timeseries arrays manipulation

Higher School of Economics, Centre for Cognition and Decision Making

Moscow, Russia

JUNIOR RESEARCH FELLOW

Feb. 2017 – Dec. 2021

- Led 4-people group developing software for real-time feature extraction and 3D visualization of brain activity from EEG in **Python**
- Sped up by a factor of 10 the beamformer inverse solver in **MNE-python** by modifying the algorithm for vectorized computations
- Created a pipeline for MEG data preprocessing, see [metacognition](#), [MRI_metacognition](#) on github

University of Montreal, CERNEC lab.

Montreal, Canada

VISITING RESEARCHER, TEMPORARY POSITION

Oct. – Dec. 2015, May 2016 – Dec. 2016

- Built a classifier for ASD patients vs. Controls with 75% accuracy using classical ML and information geometry in **Python**
- Co-developed an open-source **Python** package for heavy neuroimaging data processing, [Neuropycon](#), [Meunier et al. \[2020\]](#)

Moscow State University for Pedagogics and Education, MEG Center

Moscow, Russia

JUNIOR RESEARCH FELLOW

Feb 2015 – Dec 2018

- Published two papers in international collaboration with the University of Montreal, see [Alamian et al. \[2017a,b\]](#)

Scientific Research Institute of System Analysis

Moscow, Russia

RESEARCH ASSISTANT, PROMOTED TO JUNIOR RESEARCH FELLOW

Jun. 2011 – Jan. 2015

- Validated commercial software for simulations of flow in jet engines by comparing simulated vs. theoretical shock wave parameters
- Developed a droplet evaporation model in **C++**

Education

Ph.D. in Computer Science

Moscow, Russia

HIGHER SCHOOL OF ECONOMICS, FACULTY OF COMPUTER SCIENCE

Jan. 2016 – Nov. 2021

- Thesis: "Optimal methods for functional connectivity estimation in magnetoencephalography."; GPA: 4.0
- Published a paper in a leading neuroscientific journal (see [Ossadtchi et al. \[2018\]](#)) by proposing an algorithm for brain signals analysis.

Specialist degree in Mechanics (Masters equivalent)

Moscow, Russia

LOMONOSOV MOSCOW STATE UNIVERSITY, DEPARTMENT OF MECHANICS AND MATHEMATICS

Sep. 2008 – Jun. 2013

- Thesis: "Enhancement and validation of LOGOS software for simulations of the reactive fluid flows."

Honors & Awards

- Selected for 2-year *HSE Academic Scholarship* for publishing a paper in a high-impact journal Moscow, Russia
2019
- Selected 1-st out of 5 teams in *IEEE Brain Data Bank Challenge* for building a drinking game based on a brain-computer interface St. Petersburg, Russia
2017

Conference contributions

POSTER PRESENTATIONS

Biomag 2022	Birmingham, UK
OVERT SPEECH DECODING FROM MEG DATA DECONTAMINATED FROM ARTICULATION ARTIFACTS	2022
Biomag 2018	Philadelphia, USA
OBLIQUE PROJECTION FOR PHASE SHIFT INVARIANT IMAGING OF COHERENT SOURCES	2018
Tubingen Systems Neuroscience Symposium 2018	Tubingen, Germany
OPTIMIZED PROJECTION FOR ZERO PHASE LAG CONNECTIVITY ESTIMATION	2018
Biomag 2018	Philadelphia, USA
NEUROPYCON: A PYTHON PACKAGE FOR EFFICIENT MULTI-MODAL BRAIN NETWORK ANALYSIS	2018
5th Workshop on Optically-Pumped Magnetometers	Freiburg, Switzerland
OPM VS. SQUID ARRAYS IN MEG FUNCTIONAL CONNECTIVITY ESTIMATION	2017
Biomag 2016	Seoul, South Korea
POWER AND SHIFT INVARIANT IMAGING OF COHERENT SOURCES BY MEG DATA	2016
Brain Connectivity Workshop 2015	San Diego, USA
GLOBALLY-OPTIMIZED POWER AND SHIFT INVARIANT IMAGING OF COHERENT SOURCES	2015

TALKS

International conference “Brain-Computer Interface: Science and Practice”	Samara, Russia
COGNIGRAPH: A REAL-TIME EEG-BASED SOURCE IMAGING SOFTWARE	2019
Comprehensive training “MEG at McGill”	Montreal, Canada
MEG RESTING-STATE IN AUTISM. APPROACH TO ANALYSIS.	2015

Publications

1. Dmitrii Altukhov, Daria Kleevea, and Alexei Ossadtchi. PSIICOS projection optimality for EEG and MEG based functional coupling detection. *BioRxiv*, 2023
2. V. Manyukhina et al. Globally elevated excitation-inhibition ratio in children with autism spectrum disorder and below-average intelligence. *Molecular Autism*, 2022
3. B. Martín-Luengo et al. Retrospective confidence judgements in general-knowledge questions. *PsyArXiv*, 2021
4. D. Meunier et al. NeuroPycon: An open-source python toolbox for fast multi-modal and reproducible brain connectivity pipelines. *NeuroImage*, 2020
5. E. Combrisson et al. Visbrain: A multi-purpose GPU-accelerated open-source suite for multimodal brain data visualization. *Frontiers in Neuroinformatics*, 13, 2019
6. A. Ossadtchi, D. Altukhov, and K. Jerbi. Phase shift invariant imaging of coherent sources (PSIICOS) from MEG data. *NeuroImage*, 183, 2018
7. Z. Yapple et al. Power of feedback-induced beta oscillations reflect omission of rewards: evidence from an EEG gambling study. *Frontiers in Neuroscience*, 12, 2018
8. G. Alamian et al. Alterations of Intrinsic Brain Connectivity Patterns in Depression and Bipolar Disorders: A Critical Assessment of Magnetoencephalography-Based Evidence. *Frontiers in Psychiatry*, 8(March), 2017a
9. G. Alamian et al. Measuring alterations in oscillatory brain networks in schizophrenia with resting-state MEG: State-of-the-art and methodological challenges. *Clinical Neurophysiology*, 128(9), 2017b
10. N. Smirnov et al. Supercomputer simulations of detonation of hydrogen-air mixtures. *International Journal of Hydrogen Energy*, 2015a
11. N. Smirnov et al. Accumulation of errors in numerical simulations of chemically reacting gas dynamics. *Acta Astronautica*, 2015b
12. V. Betelin et al. Supercomputer modeling of hydrogen combustion in rocket engines. *Acta Astronautica*, 2012