

# Ilia Semenkov

PhD, Research Scientist (AI/ML)

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## SUMMARY

AI/ML research scientist with end-to-end ownership across applied and methodological projects, from problem framing and reproducible experimentation to publication and open-source release. Recent work spans neuroimaging and biosignals, with parallel contributions in multimodal learning, interpretable models, and computer vision benchmarking.

## EXPERIENCE

### Research Fellow | Artificial Intelligence Research Institute

Dec 2021 - Present | Moscow, Russia

Drive AI/ML methodology within research projects, from problem formulation and model design to baselines, evaluation protocols, and ablation strategy.

Build end-to-end research pipelines and run publication-grade experiments with strong emphasis on reproducibility, robustness, and analysis quality.

Co-author papers through the full research cycle, including implementation, additional experiments, error analysis, and revision rounds.

### Research Fellow | HSE University

Oct 2023 - Present | Moscow, Russia

Translate scientific questions from interdisciplinary collaborators into concrete ML tasks, data formulations, and validation setups.

Provide technical ML leadership across collaborative projects through architecture reviews, experiment design, and quality control of results.

Supervise students and junior researchers across theses, internships, and project work, helping scope problems and review implementations and findings.

### Scientific Advisor | ITMO University

Jan 2024 - Present | Moscow, Russia

Advise MSc research in AI/ML by shaping research questions, methodology, and evaluation plans.

Review experiments, results, and thesis narratives to bring projects to a coherent and technically sound final form.

## EARLIER EXPERIENCE

Research Intern | HSE University | Apr 2020 - Jun 2021 | Moscow, Russia

Teaching Assistant | HSE University | Jan 2017 - Jun 2021 | Moscow, Russia

Research Intern | Institute for Problems of Information Transmission | Feb 2020 - Apr 2021 | Moscow, Russia

## SELECTED PROJECTS

### Compact Interpretable Neural Decoders

Slim decoding architectures that expose spatial and temporal structure instead of hiding it inside opaque representations.

### Safer Brain Surgery Speech Mapping

Stimulation-free mapping of speech-related cortex from ECoG as a safer complement to direct electrical stimulation.

### Real-Time Brain Signal Tracking

Millisecond-scale tracking of neural rhythm envelope and phase for closed-loop EEG applications.

### Camera Vision Benchmarks at Scale

Large-scale datasets and challenge protocols for more reliable evaluation in computational color constancy.

## SELECTED PUBLICATIONS AND OUTPUTS

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### **Real-time low latency estimation of brain rhythms with deep neural networks**

Journal of Neural Engineering, 2023

### **Representational dissimilarity component analysis (ReDisCA)**

NeuroImage, 2024

### **Towards stimulation-free automatic electrocorticographic speech mapping in neurosurgery patients**

Journal of Neural Engineering, 2025

### **The Cube+ + Illumination Estimation Dataset**

IEEE Access, 2020

### **SIGNAL: Dataset for Semantic and Inferred Grammar Neurological Analysis of Language**

Scientific Data, 2025

## EDUCATION

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### **Ph.D. in Computer Science | HSE University | 2021 - 2025**

Thesis: "Neural network-based methods for decoding multimodal neuroimaging data"

### **M.S. in Computer Science | HSE University | 2019 - 2021**

### **B.S. in Public Administration | HSE University | 2015 - 2019**

## SKILLS

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### **EXPERTISE**

Deep learning | Representation learning | Multimodal learning | Neuroimaging (EEG, MEG, fMRI, ECoG) | Interpretable ML | Computer vision

### **TECH**

Python | PyTorch | Git | Linux | Slurm

### **LANGUAGES**

English (fluent) | Russian (native)