

# Jurijs Nazarovs

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## RESEARCH EXPERIENCE

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### Amazon Alexa AI, Applied Scientist Internship

May 2022 - September 2022

Robustness of Vision Language Models to linguistic variations and image manipulation. First author paper.

### Microsoft Research (MSR), Research Internship

May 2021 - August 2021

Developed temporal probabilistic deep learning methods for defensive cyber domain. First author paper/patent.

### NEC Labs America, Research Internship

May 2020 - August 2020

Proposed a new triplet-based loss function and a framework for ordinal time series classification problem robust against missing labels. First author paper and patent.

## Publications

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**Functional NODE.** Proposed a new Functional NODE framework which allows to sample trajectories in a VAE-like procedure and perform statistical inference. Under submission.

**Improving Robustness of VQA Models by Adversarial and Mixup Augmentation.** Proposed an adversarial objective function to improve robustness of VQA to linguistic variations and visual manipulations. Under submission.

**Understanding Uncertainty Maps in Vision with Statistical Testing,** CVPR 2022 (25% acceptance rate). Proposed the framework based on Warping Neural ODE and Random Fields theory to derive significant regions of the Uncertainty Maps obtained from probabilistic Deep Neural Networks.

**Image2Gif: Generating Continuous Realistic Animations with Warping NODEs,** CVPR 2022 (AI4CC workshop). Proposed a new framework based on Warping Neural ODE to generate GIF between two conceptually far apart frames.

**Mixed Effects Neural ODE: A variational approximation for analyzing the dynamics of panel data,** UAI 2021 (26% acceptance rate). Proposed the Mixed-Effect Neural ODE model and the new ELBO-based loss, which allows to model uncertainty like SDE, but use ODE solvers, for trajectory prediction.

**Graph Reparameterization for enabling 1000+ Monte Carlo Iterations in Bayesian Deep Neural Networks,** UAI 2021 (26% acceptance rate). Proposed a new framework to construct an MC estimator for the KL term, which significantly decreases GPU memory needed to run VI version of Bayesian Neural networks and improves runtime. Memory savings allow us to run up to 1000 or more MC iterations on a single GPU.

**Radial Spike and Slab Bayesian Neural Networks for Sparse Data in Ransomware Attacks,** Under submission and filed U.S. Patent.

**Ordinal Quadruplet: Retrieval of Missing Labels in Ordinal Time Series,** U.S. Patent.

**Expanded encyclopaedias of DNA elements in the human and mouse genomes,** Nature.

**Perspectives on ENCODE,** Nature.

## EDUCATION

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### University of Wisconsin - Madison, Madison, WI

PhD, Statistics

MS, Computer Science

2016 - 2023 [April]

2018 - 2019

### Duke University, Durham, NC

Master of Arts, Economics

2014-2016

### Higher School of Economics, Moscow, Russia

Bachelor of Science, Applied Mathematics and Computer Science

2010-2014

## SKILLS

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Computer Vision, Deep/Machine Learning, Multimodality, LLM, VLM, Trajectory Prediction, Probabilistic Models

Programming: Python (PyTorch, TensorFlow), R, Bash, Matlab, Java, C++