Jurijs (Yuri) Nazarovs

Led cutting-edge research with hands on experience on building Deep Neural Networks in a variety of fields, including foundation models, generative temporal-spatial models, computer vision, vision language models.

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INDUSTRY EXPERIENCE

Ambient.ai, Applied Research Scientist   April 2023

Lead the project on Incremental Learning of Object Detection models. Developed an automated labeling pipeline utilizing the vision-language model, Grounding DINO, which reduced labeling costs by 50%. Introduced a pioneering approach for detecting abnormal behavior in crowds using Optical Flow. Developed an innovative data generation strategy to overcome the critical challenge of in-field data scarcity.

Amazon Alexa AI, Applied Scientist   May 2022 - September 2022

Developed a novel adversarial training method to enhance the robustness of a Vision Language Model-based Question Answering system (VQA) to linguistic variations and image manipulations. Utilizing multimodality UNITER-like architecture.

Microsoft Research (MSR), Researcher   May 2021 - August 2021

Designed and implemented (PyTorch) a novel Bayesian Neural Networks as cutting-edge temporal probabilistic deep learning techniques for the defense cyber domain to handle sparse, imbalanced in classes and limited in size data sets. Method is used as alarming system for human in-the-loop to detect possible ransomware. A first-author publication and secured a patent.

NEC Labs America, Researcher   May 2020 - August 2020

Developed and implemented (Tensorflow) a novel triplet-based loss function and as a zero-shot framework for ordinal time series classification problems, resulting in a robust solution against missing labels.

EDUCATION

University of Wisconsin - Madison, Madison, WI. PhD, Statistics	2016 - 2023
University of Wisconsin - Madison, Madison, WI. MS, Computer Science	2018 - 2019
Duke University, Durham, NC. MA, Economics	2014-2016

SKILLS

Computer Vision, Deep/Machine Learning, Multimodality, LLM, VLM, Trajectory Prediction, Perception, Probabilistic Models, VAE, BNN, GAN, Ensemble Learning, xgboost, Python (PyTorch, TensorFlow), R, Bash, Linux, AWS, Matlab, Java, C++.

PUBLICATIONS

Understanding Uncertainty Maps in Vision with Statistical Testing, **CVPR 2022** (25% acceptance rate). Introduced a stable diffusion like model, Warping Neural ODE combining with Random Fields theory, to derive significant regions of the Uncertainty Maps obtained from probabilistic DNN (BNN/VAE) in image generation and perception settings, like segmentation.

Image2Gif: Generating Continuous Realistic Animations with Warping NODEs, **CVPR 2022** (AI4CC workshop). Introduced a novel Deep learning Module, Warping Neural ODE, as a Video Frame Interpolation (VFI) mechanism, to generate GIF between two conceptually far apart frames. Method allows to generate unlimited number of FPS, making smooth VFI.

Mixed Effects Neural ODE: A variational approximation for analyzing the dynamics of panel data, **UAI 2021** (26% acceptance rate). Introduced the Mixed-Effect Neural ODE model with the new ELBO-based loss, which allows to model uncertainty like SDE, but use ODE solvers in combination with DNN, for trajectory prediction of physical processes, humanoids and reconstruction of 3D brain scans of Alzheimer's disease progression.

Functional NODE. Introduced a new Functional NODE framework which allows to sample trajectories in a VAE-like procedure, e.g. human/skeleton actions, physical processes, and other and perform statistical inference. Under submission.

Radial Spike and Slab Bayesian Neural Networks for Sparse Data in Ransomware Attacks, 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.