Nina Shvetsova (Tuluptceva)

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Education

2017–2019 **Lomonosov Moscow State University, Moscow, Russia**, *M.Sc.*,
Applied Mathematics and Computer Science, Graphics and Media Lab
Cum. GPA: 4.94 out of 5.
Thesis: GAN-based Anomaly Detection

2013–2017 **Lomonosov Moscow State University, Moscow, Russia**, *B.Sc.*,
Applied Mathematics and Computer Science, Graphics and Media Lab
Cum. GPA: 4.88 out of 5.
Thesis: Neural Network-based Sportswear Number Recognition Algorithm

Additional Education

2020 **Coursera**, *Writing in the Sciences (Stanford University)*

2019 **Coursera**, *Bayesian Methods for Machine Learning (National Research University Higher School of Economics)*

2018 **Summer School «Deep Bayes»**, *Bayesian Methods Research Group*

2015 – 2017 **«Technosphere»**, *MailRu Group*,
Final Project: CoinFinder – Search for Coins by Photo in Online Collections
Courses: Introduction to Data Analysis, Big Data Analysis Algorithms, Neural Networks, Information Retrieval, Hadoop, Advanced C++ Programming, Project Management

Experience

2021–now **Research Assistant, Doctoral Student**, *Goethe University Frankfurt*
- Multi-modal video understanding
- Self-supervised visual representation learning
- Self-supervised video grounding

2019–2021 **Junior Scientist**, *Philips Innovation Lab RUS*
- Deep anomaly detection on radiology images (X-ray, CT, MRI)
- Domain adaptation on chest X-rays: image-based and feature-based methods
- Pneumothorax detection on chest X-rays
- Weakly-supervised disease localization on chest X-rays
- COVID-19 Lung CT Lesion Segmentation Challenge

2017–2019 **Associate Scientist**, *Philips Innovation Lab RUS*
- Implementation and improvement of various approaches to the training of Generative Adversarial Networks: Progressive Growing of GAN, WGAN, GAN with trainable latent space, content-style decomposition in GANs.
- Development of an image anomaly detection algorithm based on Generative Adversarial Networks.
- Improvement of an annotation for nuclei segmentation, nuclei segmentation using U-Net, SegNet, etc.
- Research of the application image anomaly detection approaches to the H&E-stained nuclei images.

2017–2017 **Intern Developer**, *Yandex, Search department, A/B testing group*
- Development and support of a time series processing system.
- Support A/B testing system.

Publications

2022 Shvetsova, Nina, et al. “Everything at Once–Multi-modal Fusion Transformer for Video Retrieval.” is accepted in CVPR 2022.

2022 Zimmerer, David, et al. “MOOD 2020: A Public Benchmark for Out-of-Distribution Detection and Localization on Medical Images” is accepted in IEEE Transactions on Medical Imaging.

2021 Duarte, Kevin, et al. “Routing with Self-Attention for Multimodal Capsule Networks.” arXiv, 2021.

2021 Shvetsova, Nina, et al. “Anomaly Detection with Deep Perceptual Autoencoders.” in IEEE Access, 2021.

2019 Tuluptceva, Nina, et al. “Perceptual Image Anomaly Detection.” Asian Conference on Pattern Recognition. Springer, Cham, 2019.

Talks

2020 Poster at WiCV workshop in conjunction with ECCV 2020

2020 Talk at Spotlight Session of the Philips AI conference

2019 Oral presentation at ACPR'19

Challenges

2021 The Bronze Medal in "RANZCR CLiP - Catheter and Line Position Challenge" (kaggle)

2020 The Third Place in "MOOD 2020: Medical Out-of-Distribution Analysis Challenge" in conjunction with MICCAI 2020 (Pixel Level Track)

Awards

2019 IAPR Best Paper Award, "Perceptual Image Anomaly Detection", ACPR'19

Courses

M.Sc Machine Learning, Deep Learning, Computer Vision, Modern Methods of Image Processing, Modern Methods of Speech Recognition and Synthesis, Advanced Computer Graphics Methods, Modern Methods of Distributed Data Storage and Processing

B.Sc. Mathematical Analysis, Algebra and Geometry, Applied Algebra, Probability Theory and Mathematical Statistics, Introduction in Computer Vision, Addition Chapters of Computer Vision, Computer Graphics, Probabilistic Topic Modelling, Architecture and Programming of Massively Parallel Processing Systems (CUDA Programming), Hadoop

Skills and Areas of Expertise

Machine Learning, Deep Learning, Computer Vision, Medical Image Analysis

Python (pytorch, tensorflow, keras, opencv, numpy, pandas, sklearn) on level appropriate for research and industrial programming

C++ (STL, Qt, Boost) on level appropriate for industrial programming

Git, Tex/Latex, Matlab, CUDA, Java, Hadoop