Alexey Artemov Cirriculum Vitæ

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Work address:
Technical University of Munich
Department of Informatics
Boltzmannstraße 3
85748 Garching
Germany

Contacts:
Tel.: +49 152 22152441.
Email: alexey.artemov@tum.de.
Web: artonson.github.io.
Skype: alexey.artemov.

Home address:
Mühlfeldweg 12
85748 Garching
Germany

Academic Positions

Research Associate	2022–

Technical University of Munich, Munich, Germany
Topics: 3D Scanning and Reconstruction
Advisors: Matthias Nießner

Postdoctoral Researcher	2017–2022

Skolkovo Institute of Science and Technology, Moscow, Russia
Topics: 3D Reconstruction and Digital Geometry Processing
Advisors: Evgeny Burnaev and Denis Zorin
Investigating computer vision, digital geometry processing, and machine learning
tasks, technically directing a team of 20 PhD and MSc students and developers.

Education

PhD in Mathematical Models, Numerical Methods and Integrated Software	Feb 2017

Institute of Systems Analysis, Moscow, Russia
Dissertation: "Trend Filtering Algorithms for Change-Point Detection"
Advisor: Evgeny Burnaev

Master of Science in Data Science	2010–2012

Yandex School of Data Analysis, Moscow, Russia

Specialist in Physics	2006–2012

Moscow State University, Moscow, Russia
Diploma thesis: "An Empirical Construction of a Possibilistic Model
with an Application to a Measurement Reduction Problem"
Advisors: Olesya Falomkina and Yuri Pytyev

Application Programming	2002–2006

Lyceum of Information Technologies 1533, Moscow, Russia
Graduate work: "Processing of Timing Diagrams for Digital Electrical Circuits"
Advisor: Ilya Artemov, Software Engineer, Gemalto LLC

General Courses	1996–2002

Secondary School No. 1, Reutov, Russia

Awards and Honors

Prize	**Ilya Segalovich Award** Outstanding contributions to applied and theoretical research in computer science and related fields	May 2021
Best X	ANNPR **Best Paper Award** "Geometric Attention for Prediction of Differential Properties in 3D Point Clouds"	Sep 2020
	SGP **Best Dataset Award** "ABC: A Big CAD Model Dataset For Geometric Deep Learning"	Aug 2019

Funding

co-PI	**RSF-DFG Grant** 19-41-04109 Project for: *"Making machine learning on static and dynamic 3D data practical"* Role: team leading and technical supervision during project accomplishment.	2019–2021
	The Ministry of Education and Science of Russian Federation Grant 14.615.21.0004 Project for: *"Machine learning technologies for 3D data processing in computer vision and remote sensing applications"* Role: team leading and technical supervision during project accomplishment.	2018–2021
Member	**The Ministry of Education and Science of Russian Federation Grant** 14.606.21.0004 Project for: *"Intelligent information system for predicting parameters and assessing the state of the road surface of highways based on artificial neural networks to ensure road safety"* Role: developed separate components within the project	2017–2019
	RFBR Research Grant 16-29-09649 Project for: *"Mathematical Foundations of an intelligent adaptive system for managing information security events in large-scale networks"* Role: developed separate components within the project	2016–2018

Peer-Reviewed Publications

[1] M. Gazdieva, O. Voynov, A. Artemov, Y. Zheng, L. Velho, and E. Burnaev. "Can We Use Neural Regularization to Solve Depth Super-Resolution?" In: *VISAPP 2022* (2022).

[2] A. Matveev, R. Rakhimov, A. Artemov, G. Bobrovskikh, V. Egiazarian, E. Bogomolov, D. Panozzo, D. Zorin, and E. Burnaev. "Def: Deep estimation of sharp geometric features in 3D shapes". In: *ACM Transactions on Graphics (TOG)* 41.4 (2022), pp. 1–22.

[3] A. Notchenko, V. Ishimtsev, A. Artemov, V. Selyutin, E. Bogomolov, and E. Burnaev. "Scan2Part: Fine-grained and Hierarchical Part-level Understanding of Real-World 3D Scans". In: *VISAPP 2022* 5 (2022), pp. 711–722.

[4] O. Voynov, G. Bobrovskikh, P. Karpyshev, A.-T. Ardelean, A. Bozhenko, S. Galochkin, E. Karmanova, P. Kopanev, Y. Labutin-Rymsho, R. Rakhimov, et al. "Multi-sensor large-scale dataset for multi-view 3D reconstruction". In: *arXiv preprint arXiv:2203.06111* (2022).

[5] A. Bokhovkin, V. Ishimtsev, E. Bogomolov, D. Zorin, A. Artemov, E. Burnaev, and A. Dai. "Towards Part-Based Understanding of RGB-D Scans". In: *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition*. 2021, pp. 7484–7494.

[6] A. Matveev, A. Artemov, D. Zorin, and E. Burnaev. "3D Parametric Wireframe Extraction Based on Distance Fields". In: 2021, pp. 316–322.

[7] R. Rakhimov, D. Volkhonskiy, A. Artemov, D. Zorin, and E. Burnaev. "Latent video transformer". In: *VISAPP 2021* 5 (2021), pp. 101–112.

[8] R. Rakhimov, E. Bogomolov, A. Notchenko, F. Mao, A. Artemov, D. Zorin, and E. Burnaev. "Making Dense-Pose fast and light". In: *Proceedings of the IEEE/CVF Winter Conference on Applications of Computer Vision*. 2021, pp. 1869–1877.

[9] A. Safin, M. Kan, N. Drobyshev, O. Voynov, A. Artemov, A. Filippov, D. Zorin, and E. Burnaev. "Towards Unpaired Depth Enhancement and Super-Resolution in the Wild". In: *arXiv preprint arXiv:2105.12038* (2021).

[10] E. Artemova, A. Bakarov, A. Artemov, E. Burnaev, and M. Sharaev. "Data-driven Models and Computational Tools for Neurolinguistics: a Language Technology Perspective". In: *Journal of Cognitive Science* 21.1 (2020), pp. 15–52.

[11] I. Barabanau, A. Artemov, E. Burnaev, and V. Murashkin. "Monocular 3D object detection via geometric reasoning on keypoints". In: *VISAPP 2020* 5 (2020), pp. 652–659.

[12] V. Egiazarian, S. Ignatyev, A. Artemov, O. Voynov, A. Kravchenko, Y. Zheng, L. Velho, and E. Burnaev. "Latent-space laplacian pyramids for adversarial representation learning with 3D point clouds". In: *VISAPP 2020* 4 (2020), pp. 421–428.

[13] V. Egiazarian, O. Voynov, A. Artemov, D. Volkhonskiy, A. Safin, M. Taktasheva, D. Zorin, and E. Burnaev. "Deep Vectorization of Technical Drawings". In: *European Conference on Computer Vision*. Springer, Cham. 2020, pp. 582–598.

[14] V. Ishimtsev, A. Bokhovkin, A. Artemov, S. Ignatyev, M. Niessner, D. Zorin, and E. Burnaev. "Cad-deform: Deformable fitting of cad models to 3d scans". In: *Computer Vision–ECCV 2020: 16th European Conference, Glasgow, UK, August 23–28, 2020, Proceedings, Part XIII 16*. Springer International Publishing. 2020, pp. 599–628.

[15] A. Matveev, A. Artemov, D. Zorin, and E. Burnaev. "Geometric Attention for Prediction of Differential Properties in 3D Point Clouds". In: *IAPR Workshop on Artificial Neural Networks in Pattern Recognition*. Springer, Cham. 2020, pp. 113–124.

[16] S. Potapova, A. Artemov, S. Sviridov, D. Musatkina, D. Zorin, and E. Burnaev. "Next Best View Planning via Reinforcement Learning for Scanning of Arbitrary 3D Shapes". In: *Journal of Communications Technology and Electronics* 65.12 (2020), pp. 1484–1490.

[17] S. Koch, A. Matveev, Z. Jiang, F. Williams, A. Artemov, E. Burnaev, M. Alexa, D. Zorin, and D. Panozzo. "Abc: A big cad model dataset for geometric deep learning". In: *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition*. 2019, pp. 9601–9611.

[18] M. Kolos, A. Marin, A. Artemov, and E. Burnaev. "Procedural Synthesis of Remote Sensing Images for Robust Change Detection with Neural Networks". In: *International Symposium on Neural Networks*. Springer, Cham. 2019, pp. 371–387.

[19] S. Pavlov, A. Artemov, M. Sharaev, A. Bernstein, and E. Burnaev. "Weakly Supervised Fine Tuning Approach for Brain Tumor Segmentation Problem". In: *2019 18th IEEE International Conference On Machine Learning And Applications (ICMLA)*. IEEE. 2019, pp. 1600–1605.

[20] M. Taktasheva, A. Matveev, A. Artemov, and E. Burnaev. "Learning to Approximate Directional Fields Defined over 2D Planes". In: *International Conference on Analysis of Images, Social Networks and Texts*. Springer, Cham. 2019, pp. 367–374.

[21] O. Voynov, A. Artemov, V. Egiazarian, A. Notchenko, G. Bobrovskikh, E. Burnaev, and D. Zorin. "Perceptual deep depth super-resolution". In: *Proceedings of the IEEE/CVF International Conference on Computer Vision*. 2019, pp. 5653–5663.

[22] A. Artemov. "Effective Signal Extraction Via Local Polynomial Approximation Under Long-Range Dependency Conditions". In: *Lobachevskii Journal of Mathematics* 39.3 (2018), pp. 309–320.

[23] A. Bernstein, E. Burnaev, E. Kondratyeva, S. Sushchinskaya, M. Sharaev, A. Andreev, A. Artemov, and R. Akzhigitov. "Machine Learning pipeline for discovering neuroimaging-based biomarkers in neurology and psychiatry". In: *arXiv preprint arXiv:1804.10163* (2018).

[24] M. Pominova, A. Artemov, M. Sharaev, E. Kondrateva, A. Bernstein, and E. Burnaev. "Voxelwise 3D Convolutional and Recurrent Neural Networks for Epilepsy and Depression Diagnostics from Structural and Functional MRI Data". In: *2018 IEEE International Conference on Data Mining Workshops (ICDMW)*. IEEE. 2018, pp. 299–307.

[25] M. Sharaev, A. Artemov, E. Kondrateva, S. Ivanov, S. Sushchinskaya, A. Bernstein, A. Cichocki, and E. Burnaev. "Learning Connectivity Patterns via Graph Kernels for fMRI-Based Depression Diagnostics". In: *2018 IEEE International Conference on Data Mining Workshops (ICDMW)*. IEEE. 2018, pp. 308–314.

[26] M. Sharaev, A. Artemov, E. Kondrateva, S. Sushchinskaya, E. Burnaev, A. Bernstein, R. Akzhigitov, and A. Andreev. "Mri-based diagnostics of depression concomitant with epilepsy: in search of the potential biomarkers". In: *2018 IEEE 5th International Conference on Data Science and Advanced Analytics (DSAA)*. IEEE. 2018, pp. 555–564.

[27] M. Sharaev, A. Andreev, A. Artemov, A. Bernstein, E. Burnaev, E. Kondratyeva, S. Sushchinskaya, and R. Akzhigitov. "fMRI: preprocessing, classification and pattern recognition". In: *arXiv preprint arXiv:1804.10167* (2018).

[28] M. Sharaev, A. Andreev, A. Artemov, E. Burnaev, E. Kondratyeva, S. Sushchinskaya, I. Samotaeva, V. Gaskin, and A. Bernstein. "Pattern Recognition Pipeline for Neuroimaging Data". In: *IAPR Workshop on Artificial Neural Networks in Pattern Recognition*. Springer, Cham. 2018, pp. 306–319.

[29] A. Artemov and E. Burnaev. "Detecting performance degradation of software-intensive systems in the presence of trends and long-range dependence". In: *2016 IEEE 16th International Conference on Data Mining Workshops (ICDMW)*. IEEE. 2016, pp. 29–36.

[30] A. Artemov and E. Burnaev. "Optimal estimation of a signal perturbed by a fractional brownian noise". In: *Theory of Probability & Its Applications* 60.1 (2016), pp. 126–134.

[31] A. Artemov and E. Burnaev. "Ensembles of detectors for online detection of transient changes". In: *Eighth International Conference on Machine Vision (ICMV 2015)*. Vol. 9875. International Society for Optics and Photonics. 2015, 98751Z.

[32] A. Artemov, E. Burnaev, and A. Lokot. "Nonparametric decomposition of quasi-periodic time series for change-point detection". In: *Eighth International Conference on Machine Vision (ICMV 2015)*. Vol. 9875. International Society for Optics and Photonics. 2015, p. 987520.

[33] A. Artemov and E. V. Burnaev. "Optimal estimation of a signal, observed in a fractional gaussian noise". In: *Teoriya Veroyatnostei i ee Primeneniya* 60.1 (2015), pp. 163–171.

[34] A. Ustyuzhanin, A. Artemov, N. Kazeev, and A. Redkin. "Event Index—an LHCb Event Search System". In: *Journal of Physics: Conference Series*. Vol. 664. 3. IOP Publishing. 2015, p. 032019.

Teaching Experience

MSc/BSc courses	Instructor, **Foundations of Software Engineering** *Skolkovo Institute of Science and Technology, Moscow, Russia* Full course (50–82 students)	Fall 2021, Fall 2020
	Instructor, **Geometric Computer Vision** *Skolkovo Institute of Science and Technology, Moscow, Russia* Full course (25 students)	Spring 2020
	Lecturer, **Applied Statistics in Machine Learning** *Higher School of Economics, Moscow, Russia* Adapted and taught the full course (60 students)	Fall 2018, Fall 2017
	Lecturer, **Statistics of Random Processes** *Higher School of Economics, Moscow, Russia* Developed and taught the full course (20 students)	Fall 2017
	Co-lecturer, **Deep Learning** *Moscow State University, Moscow, Russia* Taught two lectures on convolutional neural networks (20 students)	Fall 2016
	Teaching Assistant, **Application Programming** *Moscow State University, Russia* Tutored the full course for Physics students	2013
	Teaching Assistant, **Introduction to Experimental Techniques** *Moscow State University, Russia* Hands-on tutorials on measurement systems for Physics students	2013
Summer schools	Teaching Assistant, **Machine Learning Summer School** *Skolkovo Institute of Science and Technology, Moscow, Russia* Tutored two practicals on riemannian optimization and geometric deep learning	Aug 26–Sep 06, 2019
	Lecturer, **Fifth Machine Learning in High Energy Physics Summer School** *University of Hamburg and DESY, Hamburg, Germany* Taught one lecture and one practical session on the classic machine learning methods	Jul 1–10, 2019
	Lecturer, **Fourth Machine Learning in High Energy Physics Summer School** *University of Oxford, Oxford, UK* Taught two lectures and three practical sessions on the classic machine learning, neural nets, and their interpretation	Aug 6–12, 2018
	Lecturer, **Third Machine Learning in High Energy Physics Summer School** *Reading University, Reading, UK* Taught three lectures on the classic machine learning methods	Jul 17–23, 2017

	Lecturer, **Deep Learning**	Sep 16, 2016
	Computer Science Center, St. Petersburgh, Russia	
	Taught one lecture on convolutional neural networks	
MOOCs	Lecturer, **Coursera AML: Deep Learning for Computer Vision**	2017
	Higher School of Economics, Moscow, Russia	
	Developed the program, lectures, and programming assignments (joint with Anton Konushin). *More than 50K enrolled students!*	

Talks

Invited talks	**3D Machine Learning and DensePose** (joint with Ruslan Rakhimov)	Apr 28, 2021
	Phygitalism, Moscow, Russia	
	Latent-Space Laplacian Pyramids for Adversarial Representation Learning with 3D Point Clouds	Dec 16, 2020
	Phygital Days 2.0 at Moscow Aviation Institute, Moscow, Russia	
	ABC: A Big CAD Model Dataset for Geometric Deep Learning	Jun 30, 2020
	Phygital Days at Moscow Aviation Institute, Moscow, Russia	
	Computer Vision for MRI-Based Search of Epileptogenic Foci	May 10, 2019
	Healthcare Applications section, DataFest 2019, Moscow, Russia	
Conference talks	**Latent-Space Laplacian Pyramids for Adversarial Representation Learning with 3D Point Clouds**	Feb 29, 2020
	Visapp 2020, Valetta, Malta	
	Monocular 3D Object Detection via Geometric Reasoning on Keypoints	Feb 29, 2020
	Visapp 2020, Valetta, Malta	

Committee Service

Reviewer	**IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)**	2020, 2021, 2022
	IEEE/CVF Winter Conference on Applications of Computer Vision (WACV)	2021, 2022
	IEEE/CVF International Conference in Computer Vision (ICCV)	2021
	Asian Conference on Computer Vision (ACCV)	2020
	Neural Information Processing Systems (NeurIPS)	2020
	Workshop and Challenge on Deep Learning for Geometric Computing (DLGC)	2020, 2021
	IEEE Transactions on Visualization and Computer Graphics (TVCG)	2021
	Computer Vision and Image Understanding (CVIU)	2021
	Pattern Recognition	2019
Session chair	**International Conference on Computer Vision Theory and Applications (VISAPP)**	2020
	Session 8A - Theme: First Person and Egocentric Vision	
Workshop organizer	**Workshop and Challenge on Deep Learning for Geometric Computing (DLGC)**	2020, 2021
	CVPR 2020 Workshop and Challenge, ICCV 2021 Workshop and Challenge	
	5th ACM SIGKDD Workshop on Outlier Detection De-constructed (ODD v5.0)	2018
	KDD 2018 Workshop and Challenge, KDD 2018 Workshop	

Advising

MSc (graduated)	**Natalia Soboleva** (Skoltech) Thesis: *Machine Learning for Geometry Processing with Discrete Surface Representations* Next stop: Skoltech, Moscow, Russia	2020–2021
	Elena Zherdeva (Moscow Institute of Science and Technology) Thesis: *Neural Network Methods for Image Vectorization*	2020
	Maria Taktasheva (Skoltech) Thesis: *Deep Learning for Modelling N-directional Fields* Next stop: Facebook, London, UK	2019–2020
	Alexey Pankov (Skoltech) Thesis: *Optimization for Line Drawing Vectorization* Next stop: Snapchat, London, UK	2019–2020
	Milena Gazdieva (Skoltech) Thesis: *Network Tikhonov regularization in depth super-resolution problem* Next stop: Skoltech, Moscow, Russia	2019–2020
	Sofia Potapova (Moscow Institute of Science and Technology) Thesis: *Next Best View Planning via Reinforcement Learning for Scanning of Arbitrary 3D Shapes* Next stop: SmallTalk, Moscow, Russia	2019–2020
	Irina Khismatullina (Moscow Institute of Science and Technology) Thesis: *Automatic Typo Correction for Source Code*	2019
BSc (graduated)	**Maria Taktasheva** (Higher School of Economics) Thesis: *Text Features in Forecasting Stock Market Prices Volatility* Next stop: Skoltech, Moscow, Russia	2018
	Alexey Pankov (Higher School of Economics) Thesis: *Prediction of Patterns in Financial Time Series in Response to External Events* Next stop: Skoltech, Moscow, Russia	2018
	Nikita Drobyshev (National Research Nuclear University MEPhI) Thesis: *Filtering Methods for Volatility Prediction in Financial Time Series* Next stop: Skoltech, Moscow, Russia	2018
	Bulat Ibragimov (Moscow Institute of Science and Technology) Thesis: *A Linear Filtering Approach to Change-Point Detection Problem*	2018
	Daniil Korbut (Moscow Institute of Science and Technology) Thesis: *Kernel-Based Anomaly Detection with Application to Flight Landing Anomaly Detection*	2018
	Sergey Miller (Moscow Institute of Science and Technology) Thesis: *Gaussian Mixture Models for Anomaly Detection with Application to Flight Landing Anomaly Detection*	2018
	Anton Trubakov (Moscow Institute of Science and Technology) Thesis: *Dynamic Target Tracking Using Objectness Scores*	2018
	Dmitry Shchelchkov (Moscow Institute of Science and Technology) Thesis: *Dynamic Target Tracking in 3D Point Clouds*	2018
	Elena Zherdeva (Moscow Institute of Science and Technology) Thesis: *Semantic Segmentation and Object Detection in 3D Point Clouds*	2018
	Yuri Pechatnov (Moscow Institute of Science and Technology) Thesis: *CPU and Memory Constrained Time Series Classification*	2018
	Anna Medvedeva (Moscow Institute of Science and Technology) Thesis: *Neural network models for predicting an fMRI response to the auditory stimulus* Next stop: Yandex, Moscow, Russia	2017
	Irina Khismatullina (Moscow Institute of Science and Technology) Thesis: *Distributed word representations applied to hypernymy extraction*	2017
	Sergey Aksenov (Moscow Institute of Science and Technology) Thesis: *Language evolution models with large text corpora*	2017

Doctoral Committee

PhD   **Kirill Neklyudov** (Higher School of Economics)   Nov 20 2020
Thesis: *Bayesian approach in deep learning: refinement of discriminative and generative models*
Maxim Borisyak (Higher School of Economics)   Oct 15, 2020
Thesis: *Machine learning methods for data quality monitoring in natural sciences*

Employment

Academic	**TUM** (tum.de), Munich, Germany *Research Associate* Conducting research on deep learning-based 3D scanning and reconstruction algorithms. Advisor: Matthias Nießner	2022–present
	Skoltech (skoltech.ru), Moscow, Russia *Postdoctoral Researcher* Investigated a series of computer vision and machine learning problems while technically directing a team of 20 PhD and MSc students and developers. Advisors: Evgeny Burnaev and Denis Zorin	2017–2022
	Higher School of Economics (cs.hse.ru), Moscow, Russia *Lecturer (Computer Science)* Taught *Applied Statistics for Machine Learning* and *Statistics of Random Processes* courses	2017–2018
	Moscow Institure of Physics and Technology (mipt.ru/diht), Moscow, Russia *Advisor* Supervised MSc/BSc students' theses at the department of innovation and high technology. Topics include dynamic target tracking, time series filtering and forecasting, and exploiting distributed word representations.	2016
R&D	**Yandex.Taxi** (sdg.yandex.com), Moscow, Russia *Computer vision research engineer* Built object tracking algorithms and prototypes for a autonomoous driving project	2017
	Yandex Data Factory (yandex.com), Moscow, Russia *Computer vision data scientist* Designed a series of algorithms and prototypes for a number of computer vision and machine learning applications including object detection, face recognition, text recognition, and image classification algorithms.	2014–2017
	Yandex (yandex.ru), Moscow, Russia *Software engineer* Developed web search components	2012–2014
Internships	**LHCb CERN** (lhcb.web.cern.ch), Geneve, Switzerland *Research intern,* Engineered components of the EventIndex storage system	Summer of 2013
	Yandex (yandex.ru), Moscow, Russia *Intern (machine learning)* Developed algorithms for a statistical online change-point detection system	2011–2012
	Kniga-Service (akc.ru), Moscow, Russia *Summer research intern* Developed machine learning algorithms for an automatic information retrieval system	Summer of 2011
	ParallelGraphics (outline3d.ru), Moscow, Russia *Summer programming intern* Developed components for Outline3D interior design system	Summers of 2007, 2008, 2009, 2010

References

Evgeny Burnaev e.burnaev@skoltech.ru
Skolkovo Institute of Science and Technology, Moscow, Russia

Denis Zorin dzorin@cs.nyu.edu
Courant Institute of Mathematical Sciences, New York University, USA

Andrey Ustyuzhanin austyuzhanin@hse.ru

Higher School of Economics, Moscow, Russia

Personal Information

Date of Birth: June 20, 1989

Citizenship: Russian Federation

Spoken Languages: Russian (native), English (fluent), German (basic)