Alexey Artemov Cirriculum Vitæ

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Academic Positions

	Postdoctoral Researcher *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.	2017–

Education

PhD	**PhD in Mathematical Models, Numerical Methods and Integrated Software** *Institute of Systems Analysis, Moscow, Russia* Dissertation: "Trend Filtering Algorithms for Change-Point Detection" Advisor: Evgeny Burnaev	Feb 2017
Undergrad	**Master of Science in Data Science** *Yandex School of Data Analysis, Moscow, Russia*	2010–2012
	Specialist in Physics *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	2006–2012
Highschool	**Application Programming** *Lyceum of Information Technologies 1533, Moscow, Russia* Graduate work: "Processing of Timing Diagrams for Digital Electrical Circuits" Advisor: Ilya Artemov, Software Engineer, Gemalto LLC	2002–2006
	General Courses *Secondary School No. 1, Reutov, Russia*	1996–2002

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** Aug 2019
"ABC: A Big CAD Model Dataset For Geometric Deep Learning"

Funding

co-PI **RSF-DFG Grant** 19-41-04109 2019–2021
Project for: *"Making machine learning on static and dynamic 3D data practical"*
Role: team leading and technical supervision during project accomplishment.

The Ministry of Education and Science of Russian Federation Grant 14.615.21.0004 2018–2021
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.

Member **The Ministry of Education and Science of Russian Federation Grant** 14.606.21.0004 2017–2019
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

RFBR Research Grant 16-29-09649 2016–2018
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

Peer-Reviewed Publications

[1] Alexey Bokhovkin, Vladislav Ishimtsev, Emil Bogomolov, Denis Zorin, Alexey Artemov, Evgeny Burnaev, and Angela 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.

[2] Albert Matveev, Alexey Artemov, Denis Zorin, and Evgeny Burnaev. "3D Parametric Wireframe Extraction Based on Distance Fields". In: *arXiv preprint arXiv:2107.06165* (2021).

[3] Ruslan Rakhimov, Emil Bogomolov, Alexandr Notchenko, Fung Mao, Alexey Artemov, Denis Zorin, and Evgeny Burnaev. "Making DensePose fast and light". In: *Proceedings of the IEEE/CVF Winter Conference on Applications of Computer Vision*. 2021, pp. 1869–1877.

[4] Aleksandr Safin, Maxim Kan, Nikita Drobyshev, Oleg Voynov, Alexey Artemov, Alexander Filippov, Denis Zorin, and Evgeny Burnaev. "Towards Unpaired Depth Enhancement and Super-Resolution in the Wild". In: *arXiv preprint arXiv:2105.12038* (2021).

[5] Ekaterina Artemova, Amir Bakarov, Aleksey Artemov, Evgeny Burnaev, and Maxim Sharaev. "Data-driven models and computational tools for neurolinguistics: a language technology perspective". In: *arXiv preprint arXiv:2003.10540* (2020).

[6] Vage Egiazarian, Oleg Voynov, Alexey Artemov, Denis Volkhonskiy, Aleksandr Safin, Maria Taktasheva, Denis Zorin, and Evgeny Burnaev. "Deep Vectorization of Technical Drawings". In: *European Conference on Computer Vision*. Springer, Cham. 2020, pp. 582–598.

[7] Vladislav Ishimtsev, Alexey Bokhovkin, Alexey Artemov, Savva Ignatyev, Matthias Niessner, Denis Zorin, and Evgeny 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.

[8] Albert Matveev, Alexey Artemov, Denis Zorin, and Evgeny 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.

[9] Albert Matveev, Ruslan Rakhimov, Alexey Artemov, Gleb Bobrovskikh, Emil Bogomolov, Daniele Panozzo, Denis Zorin, and Evgeny Burnaev. "Def: Deep estimation of sharp geometric features in 3D shapes". In: *arXiv preprint arXiv:2011.15081* (2020).

[10] SG Potapova, AV Artemov, SV Sviridov, DA Musatkina, DN Zorin, and EV 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.

[11] Ruslan Rakhimov, Denis Volkhonskiy, Alexey Artemov, Denis Zorin, and Evgeny Burnaev. "Latent Video Transformer". In: *arXiv preprint arXiv:2006.10704* (2020).

[12] Ivan Barabanau, Alexey Artemov, Evgeny Burnaev, and Vyacheslav Murashkin. "Monocular 3D Object Detection via Geometric Reasoning on Keypoints". In: *arXiv preprint arXiv:1905.05618* (2019).

[13] Vage Egiazarian, Savva Ignatyev, Alexey Artemov, Oleg Voynov, Andrey Kravchenko, Youyi Zheng, Luiz Velho, and Evgeny Burnaev. "Latent-Space Laplacian Pyramids for Adversarial Representation Learning with 3D Point Clouds". In: *arXiv preprint arXiv:1912.06466* (2019).

[14] Sebastian Koch, Albert Matveev, Zhongshi Jiang, Francis Williams, Alexey Artemov, Evgeny Burnaev, Marc Alexa, Denis Zorin, and Daniele 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.

[15] Maria Kolos, Anton Marin, Alexey Artemov, and Evgeny 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.

[16] Sergey Pavlov, Alexey Artemov, Maksim Sharaev, Alexander Bernstein, and Evgeny 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.

[17] Maria Taktasheva, Albert Matveev, Alexey Artemov, and Evgeny 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.

[18] Oleg Voynov, Alexey Artemov, Vage Egiazarian, Alexander Notchenko, Gleb Bobrovskikh, Evgeny Burnaev, and Denis Zorin. "Perceptual deep depth super-resolution". In: *Proceedings of the IEEE/CVF International Conference on Computer Vision*. 2019, pp. 5653–5663.

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

[20] Alexander Bernstein, Evgeny Burnaev, Ekaterina Kondratyeva, Svetlana Sushchinskaya, Maxim Sharaev, Alexander Andreev, Alexey Artemov, and Renat Akzhigitov. "Machine Learning pipeline for discovering neuroimaging-based biomarkers in neurology and psychiatry". In: *arXiv preprint arXiv:1804.10163* (2018).

[21] Marina Pominova, Alexey Artemov, Maksim Sharaev, Ekaterina Kondrateva, Alexander Bernstein, and Evgeny 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.

[22] Maksim Sharaev, Alexey Artemov, Ekaterina Kondrateva, Sergei Ivanov, Svetlana Sushchinskaya, Alexander Bernstein, Andrzej Cichocki, and Evgeny 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.

[23] Maksim Sharaev, Alexey Artemov, Ekaterina Kondrateva, Svetlana Sushchinskaya, Evgeny Burnaev, Alexander Bernstein, Renat Akzhigitov, and Alexander 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.

[24] Maxim Sharaev, Alexander Andreev, Alexey Artemov, Alexander Bernstein, Evgeny Burnaev, Ekaterina Kondratyeva, Svetlana Sushchinskaya, and Renat Akzhigitov. "fMRI: preprocessing, classification and pattern recognition". In: *arXiv preprint arXiv:1804.10167* (2018).

[25] Maxim Sharaev, Alexander Andreev, Alexey Artemov, Evgeny Burnaev, Ekaterina Kondratyeva, Svetlana Sushchinskaya, Irina Samotaeva, Vladislav Gaskin, and Alexander Bernstein. "Pattern Recognition Pipeline for Neuroimaging Data". In: *IAPR Workshop on Artificial Neural Networks in Pattern Recognition*. Springer, Cham. 2018, pp. 306–319.

[26] Alexey Artemov and Evgeny 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.

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

[28] Alexey Artemov and Evgeny 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.

[29] Alexey Artemov, Evgeny Burnaev, and Andrey 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.

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

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

Talks

Invited talks	**3D Machine Learning and DensePose** (joint with Ruslan Rakhimov) *Phygitalism, Moscow, Russia*	Apr 28, 2021

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

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)** *Session 8A - Theme: First Person and Egocentric Vision*	2020
Workshop organizer	**Workshop and Challenge on Deep Learning for Geometric Computing (DLGC)** *CVPR 2020 Workshop and Challenge*, *ICCV 2021 Workshop and Challenge*	2020, 2021

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

Employment

Academic	**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–present
	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
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Courant Institute of Mathematical Sciences, New York University, USA

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Personal Information

Date of Birth: June 20, 1989

Citizenship: Russian Federation

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

Extraprofessional interests: Vocals and jazz music, sailing, pipe smoking, art and cultural heritage