

# BORIS VISHNYAKOV

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Date of Birth: 27.01.1984 (38 years old)



## ABOUT ME

My name is Boris Vishnyakov. I have over 17 years of experience in machine/deep learning, image processing, artificial intelligence and software development for real-time video surveillance, biometrics, autonomous driving, natural language processing, auto ML tasks; over 12 years in team and project management. At the moment I hold a deputy head of department for AI and data analysis position and manage about 100 scientists, developers, engineers, testers and other technical staff, divided into 4 labs. I have wide business interests with many participants in the security and retail markets. I have a PhD degree in system analysis, control and information processing and quite a number of publications in international journals.

I have a full-stack experience in building an end solution from scratch: from data mining to DNN architecture design and training using PyTorch/TensorFlow/etc., quantization and pruning, embedding ONNX model on SoC using frameworks OpenVINO/TensorRT/MNN/etc., wrapping the solution into a cloud service or real-time client-server application (C++, C#, Python, etc.). I mostly use Azure DevOps for development, testing, release and deploy management, some projects are in GitLab.

I am looking for an **AI Architect** or **Research and development group leader** position in a respectable Russian or international company.

**Desired salary: 10000\$+**

For full interactive CV please visit <http://me.ellectu.net>.

## EDUCATION

Moscow Aviation Institute – Applied Mathematics (2000-2009). Graduated with honors from the university in 2006. Got PhD degree in system analysis, control and information processing in 2009: “Development of deterministic equivalent and bootstrap methods for stochastic programming tasks with probabilistic or quantile criteria”.

## OVER 17 YEARS EXPERIENCE

--- **FGUP GOSNIIAS (2012 – PRESENT)**

### DEPUTY HEAD OF DEPARTEMENT (2022-PRESENT)

Leading a half of department: about 100 people (scientists, developers, engineers, testers and other technical staff), divided into 4 laboratories

- Development of application software
- Development of DCNN algorithms for object classification, detection and tracking, recognition, image segmentation, 3D dense reconstruction, lidar data analysis, face detection and recognition, behavior recognition, NLP, data analysis
- Development new DCNN architectures and learning methods: reinforcement learning, auto ML, NLP, attention models
- Writing papers, participation in the top conferences (IEEE, SPIE, ISPRS)

Project management:

- Client-server platform for deep learning (Platform-DNN)
- Client-server system of aerial photography
- Client-server video analytic system for CCTV cameras
- Client-server biometric system for CCTV cameras
- ROS2 set of applications for autonomous driving
- NLP and attention models for document classification and correlation
- Auto ML for real-time applications
- Reinforcement learning for antagonistic games

### **HEAD OF LABORATORY (2012-2021)**

Leading a laboratory of 12-24 people (scientists, developers, engineers, testers and other technical staff), divided into 3 groups

Development of application software

Writing papers, participation in the top conferences (IEEE, SPIE, ISPRS)

Development of new methods for image processing and machine learning

Project management:

- Client-server biometric system using DL photos in US (West Virginia, Indiana)
- Client-server system of aerial photography
- Library for video analysis (AxxonSoft)
- Client-server system for video processing (AnalyticVideo)
- Leading two RFBR grants (12-07-00789 Technology and development of intelligent video analytics for automated situational video surveillance and security, 15-07-09362 Detection and identification of the person and the vehicle on the images from the cameras), taking part in other 5-7 RFBR grants.

--- **FGUP GOSNIIAS (2010 – 2012) HEAD OF GROUP**

--- **FGUP GOSNIIAS (2006 – 2010) ENGINEER**

--- **FGUP GOSNIIAS (2005 – 2006) TECHNICIAN**

--- **MOSCOW AVIATION INSTITUTE (2009 – 2014)**

--- **MOSCOW INSTITUTE OF PHYSICS AND TECHNOLOGY (2012 – 2014, 2021 – PRESENT)**

### **ASSOCIATE PROFESSOR**

Lectures:

- Probability theory and statistics
- Applied statistics in sociology
- Image processing
- Artificial intelligence and machine learning

Practice and labs:

- Probability theory and statistics
- Applied statistics in sociology
- Mathematical analysis
- The theory of stochastic processes
- Artificial intelligence and machine learning

### **PERSONAL QUALITIES**

I am an energetic person and I learn very fast. I have the ability to understand the problem and find an effective solution in a limited period of time.

I have advanced skills in such fields as video surveillance, video analytics, facial biometrics, autonomous driving, image processing, machine learning (including deep learning: reinforcement learning, NLP, Auto ML).

I also have advanced skills in team and project management, software development (full life cycle of development), writing technical specifications and business communication.

## SKILLS

### MANAGEMENT SKILLS

- TEAM MANAGEMENT
- PROJECT MANAGEMENT
- FULL CYCLE SOFTWARE DEVELOPMENT
- SCRUM/AGILE

### MANAGEMENT SOFTWARE

- FULL CYCLE DEVELOPMENT
- MS SHAREPOINT
- TEAM FOUNDATION SERVER / AZURE DEV OPS

### SCIENTIFIC FIELDS

- STATISTICS AND DATA MINING
- DEEP LEARNING
- MACHINE LEARNING
- IMAGE PROCESSING
- IMAGE SEQUENCE PROCESSING
- STOCHASTIC PROGRAMMING
- REINFORCEMENT LEARNING
- NATURAL LANGUAGE PROCESSING
- AUTO ML

### SCIENTIFIC SOFTWARE

- MATHCAD
- MAPLE
- MATLAB
- STATISTICA
- R

### PROGRAMMING AND MARKUP LANGUAGES

- C++ (STANDARD, VISUAL C++, QT, STD, C++ 11, 14, 17)
- C# (.NET, WPF)
- PYTHON (STANDARD, NUMPY, PANDAS)
- R
- BASH, SHELL
- PHP
- PERL
- JAVASCRIPT (STANDARD, JQUERY, AJAX)
- HTML, CSS (2.0, 3.0, BOOTSTRAP, FOUNDATION, BLUEPRINT)
- TEX, LATEX
- PASCAL

### SYSTEM, PROGRAMMING, OFFICE AND MULTIMEDIA SOFTWARE

- WINDOWS (XP, VISTA, 7, 8, 10), WINDOWS SERVER (2003, 2008, 2012)
- LINUX (DEBIAN, UBUNTU, KUBUNTU)
- MS VISUAL STUDIO, ECLIPSE, QT CREATOR
- MS OFFICE (MS WORD, MS POWERPOINT, MS EXCEL, MS SWAY)
- OPENOFFICE
- GOOGLE DOCS
- GITHUB
- PHOTOSHOP
- FFMPEG, MENCODER, VIRTUALDUB

## KEY PAPERS

1. Boris V. Vishnyakov and Andrey I. Kibzun A Two-Step Capital Variation Model: Optimization by Different Statistical Criteria // Automation and Remote Control 66(7):1137-1152, 2005. [Scopus, WoS]
2. Boris V. Vishnyakov and Andrey I. Kibzun Deterministic equivalents for stochastic programming problems with probabilistic criteria // Avtomatika i Telemekhanika (6):126-143, 2006. In Russian.
3. Boris V. Vishnyakov and Andrey I. Kibzun Application of the bootstrap method for estimation of the quantile function // Automation and Remote Control 68(11):1931-1944, 2007. [Scopus, WoS]

4. Boris V. Vishnyakov, Yuri V. Vizilter, Vladimir A. Knyaz Spectrum-based object detection and tracking technique for digital video surveillance // Melbourne, Australia. International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences (XXXIX-B3):579-583, 2012. [Scopus]
5. Boris V. Vishnyakov, Anton I. Egorov Construction of confidence regions for motion trajectories of objects in computer vision problems // Journal of computer and systems sciences international 52(3):124-132, 2013. [Scopus, WoS]
6. Boris V. Vishnyakov, Ivan K. Malin, Yuri V. Vizilter, Shih-Chia Huang, Sy-Yen Kuo Fast car/human classification methods in the computer vision tasks // Munich, Germany. Proceedings of SPIE Optical Metrology, (8791):87911L-1 – 87911L-10, 2013. [Scopus, WoS]
7. Boris V. Vishnyakov, Yi-Jui Cheng, Bo-Hao Chen, Shih-Chia Huang, Sy-Yen Kuo, A. Kopylov, O. Seredin, L. Mestetskiy, Y. Vizilter, O. Vygolov, Chia-Ruei Lian, Chi-Ting Wu Visibility Enhancement of Single Hazy Images Using Hybrid Dark Channel Prior // In proceeding of: IEEE International Conference on Systems, Man, and Cybernetics (SMC): 3627-3632, 2013. [Scopus, WoS]
8. Boris V. Vishnyakov, Fan-Chieh Cheng, Bo-Hao Chen, Shih-Chia Huang, S-Y Kuo, A. Kopylov, Y. Vizilter, L. Mestetskiy, O. Seredin, O. Vygolov An automatic motion detection algorithm for transport monitoring systems // In proceeding of: IEEE 17th International Symposium on Consumer Electronics (ISCE): 195-196, 2013. [Scopus, WoS]
9. Boris V. Vishnyakov, Anton I. Egorov, Sergey V. Sidyakin, Ivan K. Malin, Yuri V. Vizilter Statistical model for pseudo-moving objects recognition in video surveillance systems // Zurich, Switzerland. In proceedings of Photogrammetric Computer Vision - PCV 2014 (ISPRS Technical Commission III Midterm Symposium), 2014. [Scopus]
10. Boris V. Vishnyakov, Vladimir V. Gorbatshevich, Anton I. Egorov, Sergey V. Sidyakin, Ivan K. Malin, Yuri V. Vizilter Fast moving objects detection using iLBP background model // Zurich, Switzerland. In proceedings of Photogrammetric Computer Vision - PCV 2014 (ISPRS Technical Commission III Midterm Symposium), 2014. [Scopus]
11. Boris V. Vishnyakov, Sergey V. Sidyakin, Yuri V. Vizilter Diffusion background model for moving objects detection // Moscow, Russia. The International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences (ISPRS Archives), 2015. [Scopus, WoS]
12. Boris V. Vishnyakov, Vladimir S. Gorbatshevich, Sergey V. Sidyakin Fast interframe transformation with local binary patterns // Munich, Germany. Automated Visual Inspection and Machine Vision, Proceedings of SPIE Optical Metrology: (9530), 2015. [Scopus, WoS]
13. Boris V. Vishnyakov, Yuri V. Vizilter, Vladimir V. Knyaz, Oleg V. Vygolov, Sergey Y. Zheltov Stereo sequences analysis for dynamic scene understanding in a driver assistance system // Munich, Germany. Automated Visual Inspection and Machine Vision, Proceedings of SPIE Optical Metrology: (9530), 2015. [Scopus, WoS]
14. Sergey V. Sidyakin, Boris V. Vishnyakov, Yuri V. Vizilter, and Nikolay I. Roslov Mutual comparative filtering for change detection in videos with unstable illumination conditions // Int. Arch. Photogramm. Remote Sens. Spatial Inf. Sci., XLI-B3, 535-541, 2016, doi:10.5194/isprs-archives-XLI-B3-535-2016. [Scopus, WoS]
15. V. V. Molchanov, B. V. Vishnyakov, Y. V. Vizilter, O. V. Vishnyakova, V. A. Knyaz Pedestrian detection in video surveillance using fully convolutional YOLO neural network // Proc. SPIE 10334, Automated Visual Inspection and Machine Vision II, 103340Q, 2017, doi: 10.1117/12.2270326. [Scopus, WoS]
16. S. V. Sidyakin, B. V. Vishnyakov Real-time detection of abandoned bags using CNN // Proc. SPIE 10334, Automated Visual Inspection and Machine Vision II, 103340J, 2017, doi: 10.1117/12.2270078. [Scopus, WoS]
17. Molchanov, V. V., Vishnyakov, B. V., Gorbatshevich, V. S., and Vizilter, Y. V.: Etalon images: understanding the convolution neural networks, Int. Arch. Photogramm. Remote Sens. Spatial Inf. Sci., XLII-2, 707-714, <https://doi.org/10.5194/isprs-archives-XLII-2-707-2018>, 2018. [Scopus, WoS]

18. Aglyamutdinova, D. B., Mazgutov, R. R., and Vishnyakov, B. V.: Object localization for subsequent UAV tracking, *Int. Arch. Photogramm. Remote Sens. Spatial Inf. Sci.*, XLII-2, 9-14, <https://doi.org/10.5194/isprs-archives-XLII-2-9-2018>, 2018. [Scopus, WoS]
19. Anastasiia Moiseenko, Yuri Vizilter, Boris Vishnyakov, Vladimir Gorbatshevich, and Oleg Vygolov "Region proposal-based semantic matcher", *Proc. SPIE 11061, Automated Visual Inspection and Machine Vision III*, 1106109, 2019. <https://doi.org/10.1117/12.2525233> [Scopus, WoS]
20. Stanislav Brianskiy, Boris Vishnyakov, Vladimir Gorbatshevich, and Yury Vizilter "Image filtering using morphological thickness map", *Proc. SPIE 11061, Automated Visual Inspection and Machine Vision III*, 110610A, 2019. <https://doi.org/10.1117/12.2525362> [Scopus, WoS]
21. B. Vishnyakov, Y. Blokhinov, I. Sgibnev, V. Sheverdin, A. Sorokin, A. Nikanorov, P. Masalov, K. Kazakhmedov, S. Brianskiy, E. Andrienko, and Y. Vizilter Semantic scene understanding for the autonomous platform *Int. Arch. Photogramm. Remote Sens. Spatial Inf. Sci.*, XLIII-B2-2020, 637–644, 2020, doi: 10.5194/isprs-archives-XLIII-B2-2020-637-2020 [Scopus, WoS]
22. I. Sgibnev, A. Sorokin, B. Vishnyakov, and Y. Vizilter deep semantic segmentation for the off-road autonomous driving // *Int. Arch. Photogramm. Remote Sens. Spatial Inf. Sci.*, XLIII-B2-2020, 617–622, 2020, doi.org: 10.5194/isprs-archives-XLIII-B2-2020-617-2020 [Scopus, WoS]
23. B. Vishnyakov and V. Sheverdin REAL-TIME SLAM FOR THE OFF-ROAD AUTONOMOUS DRIVING // *Int. Arch. Photogramm. Remote Sens. Spatial Inf. Sci.*, XLIII-B2-2020, 631–635, 2020, doi: 10.5194/isprs-archives-XLIII-B2-2020-631-2020 [Scopus, WoS]
24. B. Vishnyakov, I. Sgibnev, V. Sheverdin, A. Sorokin, P. Masalov, K. Kazakhmedov, S. Arseev Real-time semantic SLAM with DCNN-based feature point detection, matching and dense point cloud aggregation // *Int. Arch. Photogramm. Remote Sens. Spatial Inf. Sci.*, XLIII-B2-2021, 399–404, 2021, doi: 10.5194/isprs-archives-XLIII-B2-2021-399-2021 [Scopus, WoS]
25. Y.B. Blokhinov, E.E. Andrienko, K.K. Kazakhmedov, B.V. Vishnyakov Automatic calibration of multiple cameras and LIDARs for autonomous vehicles // *Computer Optics* 2021; 45(3): 382-393. doi: 10.18287/2412-6179-CO-812 [Scopus, WoS]
26. B. Vishnyakov, Ivan Sgibnev, Aristarkh Smirnov, Viktor Bokov, Nikita Gordeev Combined approach for face detection and head pose estimation using DCNN // XXIV ISPRS Congress, Nice, 2022. To be published. [Scopus, WoS]

## HOBBIES & INTEREST

- Web programming
- Photography
- Travelling
- Playing piano
- Football