

# Konstantin BURLACHENKO

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During my career I created Systems for Machine Learning, AI, Computer Graphics, Computer Vision, Computational Physics. I did it for HUAWEI, NVIDIA, YANDEX products via full exploiting hardware via DSL languages and using contemporary areas of Applied Math and Computer Science.

## EDUCATION

- |           |   |
|-----------|---|
| 2020-Now  | Ph.D. program in <a href="#">CS Program at King Abdullah University of Science and Technology</a> under supervision of prof. <a href="#">P.Richtarik</a>                          |
| 2016-2019 | Graduate Non-Degree Program. Leland Stanford Jr. University, Stanford, USA. Transcript : <a href="#">Link</a>   |
| JUNE 2018 | Leland Stanford Jr. University, Stanford, USA. Data, Models and Optimization Graduate Certificate : <a href="#">Link</a>  |
| JUNE 2019 | Leland Stanford Jr. University, Stanford, USA. Artificial Intelligence Graduate Certificate : <a href="#">Link</a>  |
| 2003-2009 | Master Degree in Computer Science. Bauman Moscow State Technical University, Russia. Transcript evaluated by <a href="https://wes.org">https://wes.org</a> : <a href="#">Link</a> |

## PRESENTATIONS

- |           |   |
|-----------|---|
| FEB-2020  | OpenTalks.AI, Moscow. Huawei technologies for AI developers.<br><a href="https://www.huawei.com/ru/news/ru/2020/huawei_ai_development_in_russia">https://www.huawei.com/ru/news/ru/2020/huawei_ai_development_in_russia</a>   |
| JULY-2019 | Teach own developed one month Deep Learning Course with Dmitry Kamzolov. Russia, Sochi, Srus  |
| DEC-2018  | Guest Lectures in MIPT, Moscow. Subtle things around decision trees.<br>▶ <a href="https://github.com/burlachenkok/presentations_bruziuz/tree/master">https://github.com/burlachenkok/presentations_bruziuz/tree/master</a><br>▶ <a href="https://www.youtube.com/watch?v=r4ZTy90233w">https://www.youtube.com/watch?v=r4ZTy90233w</a><br>▶ <a href="https://www.youtube.com/watch?v=evkzN6AZTnc">https://www.youtube.com/watch?v=evkzN6AZTnc</a> |
| APR-2016  | GTC 2016, San Jose. <a href="http://www.gputechconf.com/">http://www.gputechconf.com/</a> . Presenter in <a href="#">Driveworks</a> NVIDIA Booth  |
| AUG-2012  | SIGGRAPH 2012, Los Angeles. ACM Siggraph <a href="http://s2012.siggraph.org">http://s2012.siggraph.org</a> . Presenter in <a href="#">CentiLeo</a> Booth.   |

## COMPETENCES

General Programming Languages	C89/C99, C++14/11/03, C#, Python, Cython, Bash, Perl, ASM x86/x386/ARM, Java
DSL Programming Languages	GL Shader Language, TVM, Google Protobuf, CUDA, OpenCL, Matlab
Frameworks	Qt, CUDA, TensorFlow, Google Test, Windows Api, Posix, OpenGL, OpenCL, PhysX
Libraries	Numpy, CUDA, TensorFlow, cvxpy, cuda toolkit
Operating Systems	Windows Desktop, Linux, FreeBSD, Orbis, Xbox, Windows CE, Android, NDA Operating Systems
Development Environments	QtCreator, Visual Studio, Eclipse, WinDbg, Android Studio, TexStudio, gDEBugger, Nsight
Development Tools	SysInternals, AqTime, Cmake, Qmake, GNU Toolchain, CppCheck, Valgrind tools, Svn, Git
Markup and Type Languages	Latex, HTML, XML
Areas of interest	Computer Science, Machine Learning, AI, Computer Vision, System Programming, GPU Programming, Distributed Systems, Convex Optimization, Numerical Optimization, Applied Math
Examples of own Projects	Source code is providing under request. This is a projects from 100 lines to 40K lines of code.

## PROFESSIONAL EXPERIENCE

- |             |   |
|-------------|---|
| August 2020 | Principal Lead Engineer   Foundation AI Lab, HUAWEI, Moscow                             |
| March 2019  |   |
|             |   |
|             | ▶ RD in internal projects in ML/DL middleware for HUAWEI HiSilicon (NDA)                |
|             | ▶ R&D in internal projects in ML/DL middleware for HUAWEI Consumer Business Group (NDA) |
|             | ▶ Preseting HiSilicon solutions in Russian AI Conferences                               |

Windows Linux Android Modern Math Optimization AI Machine Learning Logic Computer Science WC++  
Python TVM Java Google Protobuf GitLab CMake Qt Git TensorFlow Deep Learning NDA OS

March 2019 July 2014	<b>Senior Developer Technology Engineer, NVIDIA, Moscow</b> <ul style="list-style-type: none"> <li>▶ Contribute into Driveworks SDK - computer vision, machine learning</li> <li>▶ Contribute into PhysX/Apex SDK - physics simulation, graphical special effects développement</li> <li>▶ Contribute into cuDNN/cuBLAS libraries - GPU computation, machine learning.</li> <li>▶ Contribute into RAPIDS project - GPU based Machine Learning Framework</li> </ul> <div>CUDA GLSL C++ SSE2/ARM NEON Linux Windows PS4 Xbox NDA OS OpenGL Google Tests GitLab Perl Python CMake Make Qt Git TensorFlow Computer Vision Graphics Deep Learning CppCheck</div>
July 2014 May 2013	<b>Senior Developer Engineer   Yandex Video Team, YANDEX, Moscow</b> <ul style="list-style-type: none"> <li>▶ Text and statistical machine learning features for video search <a href="http://video.yandex.ru">http://video.yandex.ru</a></li> <li>▶ Infrastructure to store static aspects web document with embedded video</li> <li>▶ Statistical analysis in several billions web documents with embedded video in MapReduce</li> <li>▶ Infrastructure to show plots for internal team's processes</li> </ul> <div>C++ Google Protobuf JavaScript Bash Python Computer Science HTML SVN MapReduce Decision Trees Linux FreeBSD HTTP Review Board</div>
April 2013 March 2012	<b>Lead Physics Engine Developer, FITTING REALITY, Moscow</b> <p>CEO Inga Nakhmanson can prove that I brought big value for the project and company. I have left due to that stopped financial support of a startup company.</p> <ul style="list-style-type: none"> <li>▶ Develop library for clothing simulation started with CUDA</li> <li>▶ Migrate cloth simulation library to OpenCL</li> <li>▶ Adapt to use this library for Ogre.</li> <li>▶ Implement custom render engine good enough for clothing visualization <a href="https://yadi.sk/d/ytygxSIYP62Tr">https://yadi.sk/d/ytygxSIYP62Tr</a></li> <li>▶ Carry internal math, programming trainings to fastly adapt into project people with different background CS/MATH/Physics</li> </ul> <div>C++ OpenGL GLSL Ogre Qt Linux Windows QMake CUDA OpenCL Physics Computer Graphics Amd gDebugger Nvidia Nsight JIRA</div>
March 2012 September 2010	<b>Software Developer Engineer, ACRONIS, Moscow</b> <p>Acronis invited B.Stroustrup author of C++ to give an advanced series of lectures about C++ which gave me additional great knowledge on the subject.</p> <ul style="list-style-type: none"> <li>▶ Low-level debugging in a big codebase</li> <li>▶ Key member of GUI team for <a href="#">Acronis Backup and Recovery 2011 Enterprise</a></li> </ul> <div>C++ C Windows WinDbg VmWare Specialized GUI library SVN SysInternals Suite AppVerifier CppCheck</div>
September 2010 March 2009	<b>Senior Software Developer Engineer, CAPITAL RESEARCH, Moscow</b> <p>Left company due to that financial support of startup have starts be problematical. CEO Kirill Garanzha can prove that I was up to last moments.</p> <ul style="list-style-type: none"> <li>▶ Developed Firefox plugin to create the three-dimensional HTML view for basics HTML elements</li> </ul> <div>Firefox C++ Windows HTML CSS Windows OpenGL GLSL</div>
June 2009 December 2006	<b>C++ Programming Engineer, FLINT AND CO, Moscow</b> <ul style="list-style-type: none"> <li>▶ Created several computer games, write drivers to custom equipment, implement computer vision and computer graphics part</li> <li>▶ Trips to customers</li> </ul> <div>C++ SDL Linux Windows Development Image Library Low level programming Computer Vision OpenGL SVN</div>
November 2006 March 2006	<b>C++ Programming Engineer, ASTRASOFT TECHNOLOGY, Moscow</b> <p><i>Left company due no interconnection with my courses in 2006</i></p> <ul style="list-style-type: none"> <li>▶ Developed visual elements of management system based on Qt and OpenGL</li> </ul> <div>C++ Qt Windows OpenGL SVN</div>

## “ REFERENCES

**Andrew Ng**

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## SOME PROJETS OUTSIDE OF WORK

### EXPERIMENTAL NEURAL NET FRAMEWORK

2019

<https://sites.google.com/site/burlachenkoc/stanford-cs230-experimental-neural-net-framework>

[Poster Presentation Session, CS230 - 2019](#) [4 minute presentation](#) [bitbucket repo](#)

CS230 : Experimental Neural Net Framework done under mentoring of Steven Ziqu Chen (stevenzc@stanford.edu)

C++ Linux Windows CUDA Python CMake

### CONVEX OPTIMIZATION SOLVERS WITH LEVERAGING INTO GPU/CPU POWER FOR AI/ML

2018

<https://sites.google.com/site/burlachenkoc/convex-optimization-solvers-with-leveraging-into-gpucpu-power-for-aiml>

[Poster Presentation Session, CS221 - 2018](#) [bitbucket repo](#)

CS221 : Convex optimization solvers with leveraging into GPU/CPU power for AI/ML under mentoring of Steven Diamond

<http://web.stanford.edu/~stevend2/>

C++ Linux Windows CUDA Python CMake Convex Optimization

### CONVEX OPTIMIZATION FOR MACHINE LEARNING

2017

<https://sites.google.com/site/burlachenkoc/articles/cvx4ml>

[Poster Presentation Session, CS229 - 2017](#)

[4 minute presentation](#)

Stanford, CS229 : Convex Optimization for Machine Learning

C++ Visual Studio Numerical Linear Algebra Convex Optimization Python CMake

### ADVANCED TOOL TO PLOT DATA

2017

[40 minute presentation](#) [github.com/burlachenkoc/plotter\\_plusplus](https://github.com/burlachenkoc/plotter_plusplus)

This is an advanced plotter tool which receives commands over the network TCP connection. Goal of this program is to assist debugging and development process. It have been written in C++ and it use Qt Framework 5.7.\* as only one external library.

C++ Linux Windows Embedded Systems Qt Python

### LANE DETECTION USING FOURIER BASED LINE DETECTOR

2016

[http://web.stanford.edu/class/cs231a/prev\\_projects\\_2016/final\\_konstantin\\_burlachenko.pdf](http://web.stanford.edu/class/cs231a/prev_projects_2016/final_konstantin_burlachenko.pdf)

[10 minute presentation](#)

Lane detection from several image input videostream.

Matlab

### SYSTEM UTILS

2018

[github.com/burlachenkoc/nvidia\\_gpu\\_info](https://github.com/burlachenkoc/nvidia_gpu_info)

[github.com/burlachenkoc/process\\_tool](https://github.com/burlachenkoc/process_tool)

[github.com/burlachenkoc/gtest\\_report](https://github.com/burlachenkoc/gtest_report)

**nvidia\_gpu\_info** - measure characteristics (including maximum throughputs) of installed NVIDIA GPU devices.

**process\_tool** - small tool to launch a process in Windows OS family and then kill process and all its descendant processes.

**gtest\_report** - script which generate rather simple HTML report based XML Google Test report.

C++ CUDA Python HTML XML WinApi

## SELECTED ARTICLES AND NOTES

NOTES ABOUT TENSORFLOW AND KERAS COMPUTATION FRAMEWORK (60 PAGES)

2020

<https://sites.google.com/site/burlachenkoc/articles/notes-about-tensor-flow-computation-framework>

NOTES ABOUT THE BOOK OF A.N.KOLOMOGOROV, S.V.FOMIN INTRODUCTORY REAL ANALYSIS BOOK (28 PAGES)

2020

<https://sites.google.com/site/burlachenkoc/articles/notes-about-the-book-of-ankolomogorovsvfomin>

MAIN MATH MODELS IN AREA OF INTEREST OF MACHINE LEARNING (17 PAGES)

2018

<https://sites.google.com/site/burlachenkoc/articles/main-math-models-in-area-of-interest-of-machine-learning>

JUST 25 PROBLEMS OF MACHINE LEARNING (15 PAGES)

2018

<https://sites.google.com/site/burlachenkoc/articles/just-25-problems-of-machine-learning>

SERIES OF NOTES ABOUT BACK PROPAGATION

2018

[https://sites.google.com/site/burlachenkoc/backpropagation\\_part\\_i](https://sites.google.com/site/burlachenkoc/backpropagation_part_i)

<https://sites.google.com/site/burlachenkoc/articles/backpropagation-part-ii>

[https://sites.google.com/site/burlachenkoc/articles/backpropagation\\_part\\_iii](https://sites.google.com/site/burlachenkoc/articles/backpropagation_part_iii)

SERIES OF NOTES ABOUT DECISION TREE MODEL

2018

<https://sites.google.com/site/burlachenkoc/articles/decision-trees-parti-decision-trees-for-regression>

<https://sites.google.com/site/burlachenkoc/articles/decision-trees-part-ii-bagged-collection-of-decision-trees>