Alexandr Khakayu

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Computer Science | Distributed Systems

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EDUCATION

National Research University Higher School of Economics, Faculty of Computer Science, Applied Mathematics and Informatics, Distributed Systems

2016 – 2022

Courses:

-Discrete Mathematics

-Linear Algebra and Geometry

-Probability Theory

-Fundamentals and Methodology of Programming: Python, C++

-Algorithms and Data Structures

-Computer Architecture and Operating Systems: Assembly, Linux, C, Unix architecture, basics of multithreading

-Matrix Calculations: matrix decompositions(LU, QR, Spectre...), iteration methods for solving systems of linear equations

-Numerical Methods: num. differentiation, num. integration, interpolation, num. methods for solving differential equations

-Basic Data Analysis Methods

-Machine Learning

-Introduction to Deep Learning

-Distributed Systems: protocols, guarantees, HTTP, failure detection, RPC, broadcast, scaling, replication, map-reduce...

-Theory and Practise of multithread synchronisation

-Methods of Optimisation

-Methods and Systems of Big Data Processing

-Theory of Complex Systems: dynamic systems, chaotic systems, time series analysis, lyapunov exponent, FNN algorithm, Rosenstein method, complexity/entropy method

SKILLS

Python

C/C++

Assembly

tensorflow, sklearn, numpy, pandas, matplotlib, seaborn

Linux/Unix

Numerical Methods

Interpolation

Matrix Calculations

Basic Algorithms

Methods for Machine Learning

Methods for Deep Learning

Distributed Systems

ACHIEVEMENTS

Russian Olympiad in informatics and cryptographics 2015.
Second place

Regional Olympiad in informatics 2016.
Fourth place

Rosatom Olympiad in mathematics 2016.
Second place

PROJECTS

Runner Game in Unreal Engine 4
06.2017 - 09.2017
-Blueprint + UE4

Public Transport Availability
10.2017 - 05.2018
-Web-service which colors Moscow districts maps depending on approximate travel time to various places (selected or random)
-HTML, Java Script, CSS, Google API

Change Detection
10.2018 - 05.2019
-Change detection on satellites images using convolutional neural network and data from LANDSAT and SENTINEL, unfinished
-Python, 2GIS

Deep Neural Networks Training Using a Distributed Computing Environment. Synchronous Approach.
10.2020 - 10.2021
-Training convolutional neural network for image classification task, using distributed GRID-system Boinc. Modification of local-SGD method with parameter server synchronization. Modification of BSP method with ring all-reduce synchronization, using Horovod framework.
-Python, Tensorflow, Horovod, Numpy, Boinc

N-body Problem
06.2021 - ...
-Comparing different methods for Gravitational Simulation of N-bodies: Euler, FMM, Burnes-Hut
-Python, Numpy, C++

Languages

Russian: native

English: upper-intermediate