Nikolay Efanov

Over 9 years in computer science and software engineering.

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EXPERIENCE

Moscow Institute of Physics and Technology, Digital Special Purpose Systems Lab — *Software Developer*

September 2017 - PRESENT

- Control system development for self-driving car
- SLAM algorithms research and experiments
- Hybrid optics calibration system development
- Multi-modem system routing software development
- OpenCV and ffmpeg-based computer vision tasks
- Development of orchestration system for machine learning experiments: GPU task scheduling, database and statistics collecting
- Backend developer (Django)

Moscow Institute of Physics and Technology, Department of Informatics — *Teaching Assistant*

September 2016 - PRESENT

Faculty Courses Lecturer:

- Programming basics (C language, 2016)
- Computer Architecture basics (ARM/x86 architectures, 2017)
- Operational Systems Basics (Since 2017)

Author's Course on MIPT "CDPE" platform (Distant):

- Fundamentals of reverse engineering and optimization programs for ARM microprocessor architecture: https://mipt.ru/cdpo/programs/software/supervised_learning.php?ELEMENT_ID=1845794

Research under the InfoTeKS-Academy grant, "Study of safe character input from keyboards" — *Researcher/Developer.*

June 2016 - January 2017

Research on input injections in modern Linux Kernel-based OS and development of 2 anti-keylogger input solutions; X-Server patching also.

RESEARCH SKILLS & ACTIVITIES

High Math, Physics, Theoretical Mechanics and Physics courses - at MIPT graduate student level.

Professional research interests:

- Discrete analysis
- Poset algebras, lattices, graphs and their application to computing systems
- Modern principles of parallel computing and concurrency
- Computer vision and applied optics
- Communication systems

PROGRAMMING SKILLS

- Python, C, C++ Programming
- Software engineering
- Userspace programming using OS and architecture instruments and features.
- System Programming
- Parallel programming
- Data analysis

(See extended list of skills below).

AWARDS

Bertrand Meyer award for best scientific paper on CEE-SEC(R)-2017: "Constructing the formal grammar of system calls":

Virtuozzo, Storage Team — *Junior Software Developer*

January 2016 - July 2016

Development of distributed storage: iSCSI drivers adaptation; Docker Swarm integration.

Parallels, Core Team — *Junior Software Developer*

June 2014 - January 2016

ARM Virtualization tasks (basically, periphery support):

- Development of Net-over-USB emulation (SMSC95xx-based)
- Minor bug fixing in network/USB subsystems

Parallels MIPT LAB, DPM project — *Researcher*

July 2013 - January 2014

Research on dynamic power management under the Ministry of Education grant:

- Research of Dynamic Power Management for cloud systems
- Research of Dynamic Power Management of HDD

Institute of Space Research (RAS), O.L.Vaisberg's group — *Researcher*

January 2013 - August 2013

Tasks on wide-angle ion optics modeling and data analysis:

- Ion optics modeling (Matlab, SimIon etc)
- Decoding and processing data from "MARS-96" mission

Crimean Astrophysical Observatory — *Developer, laboratory assistant*

June2009 - July 2010

Tasks on solar telescope automation and data processing :

- BST-2 telescope automation
- Development of "fast" filters for spectral data processing

EDUCATION

Moscow Institute of Physics and Technology, Dolgoprudny — *PhD Student*

October 2016 - Present

Department of Informatics and Computational Mathematics

http://2017.secrus.org/lang/en/about/press-center/the-winners-of-the-bertrand-meyer-award-2017

InfoTeKS-Academy research program winner(2016): "Study of safe character input from keyboards" research.

LANGUAGES

Russian, Ukrainian - native, English - MIPT basic PhD course + "Advanced & speaking skills (MIPT)"

Moscow Institute of Physics and Technology, Dolgoprudny — *Master of Science*

September 2014 - July 2016

Department of Theoretical and Applied Informatics

Moscow Institute of Physics and Technology, Dolgoprudny —Bachelor

September 2010 - July 2014

Department of Applied Mechanics

Tavrida National University, Simferopol — *Bachelor (Incomplete)*

September 2007 - June 2010

Department of Applied Mathematics.

Software Engineering Skills

Programming:

Userspace programs: knowledge and experience in IPC, network, parallel programming, communication with periphery, backend-programming.
System, Kernel and Embedded programming: knowledge of some principles and experience in system and virtualization technologies.

Programming Languages:

Python, C, C++, (ba,z)sh, JS, a bit Java, C#, Go, Lua, Matlab, etc.

Operational systems:

Unix-like (mostly Linux) - kernel (modules, drivers) / userspace development, IPC, multiprocessing & multithreading, network, periphery.

Windows - Userspace, IPC, parallel programming; little experience with drivers, system services, reverse-engineering.

Processor architectures:

- x86, ARM, principles of virtualization and vector submodules.
- Little experience with VLIV (Elbrus) and CUDA.

Communication protocols:

- OSI Model / Linux TCP/IP stack programming experience, net device emulation experience.
- USB, UART, CAN.

Data analysis & machine learning:

- Python (anaconda, spyder): numpy, pandas, scipy, scikit.learn.
- ML: caffe, a bit keras and theano.

Team work & revision control systems:

- Git, SVN, DVC (for ML)

- Youtrack/Atlassian products

Math and CS Skills

- MIPT courses background: Mathematical and Functional Analysis, Computational Mathematics, Theoretical Mechanics and Physics etc.
- Knowledge of Discrete analysis, Data structures, Algorithms and Complexity theory.
- Researches on a list of CS and applied discrete math: dynamic power management systems, reconstruction formalisms for checkpoint-restore etc.
- List of scientific publications: https://raw.githubusercontent.com/nefanov/about_me/master/publications.md

Author's Projects

- Generalized framework for correct process tree reconstruction (under development)
- Fork of CRIU with generalized framework for correct process tree reconstruction (under development)
- KPS/VIS - solutions on safe keyboard input