KONSTANTIN NARKHOV

CONTACTS

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EDUCATION

National Research Nuclear University MEPhI (Moscow Engineering Physics Institute)

Post-garduate study/course at **Scientific Research Institute of System Development**

ABOUT ME

I am an professional in the field of real-time systems programming, development modeling software for embedded systems, test automation and software verification. I am working on formalized description of multithreaded applications, development of automated software generation facilities & monitoring tools for multithreaded real-time applications. I'm a Raku (Perl6) enthusiast as well, work on module porting and contributing. My code: https://gitlab.com/pheix

HIGH SCHOOL

Sept 1999 - Feb 2005: National Research Nuclear University MEPhI (Moscow Engineering Physics Institute), faculty of Cybernetics, department №12 "Computer systems and technologies" (KSiT). The department offers the bachelors and masters degrees of "Informatics and computer technology" (09.03.01 and 09.04.01). Disciplines studied within the course: circuit and system engineering, programming languages and technologies[1].

Graduation thesis: "Development of hosting platform for Internet providers" [2]. Supervisor: Vasilyev N.P. [3]. Thesis technologies & features: Windows 2000 Server (MS SQL Server, MS IIS, ISAPI, ASP, WSH) & Delphi 6. Thesis grade: excellent. Developed under the diploma project software was integrated by "M35 Network Provider" in Nov 2005.

Graduating specialty: 09.03.01-01 "Computing machines, complexes, systems and networks" [4].

POST-GRADUATE

Apr 2007 - Aug 2009: Scientific Research Institute of System Development. Disciplines studied within the course: DSP programming & embedded real-time systems programming. Advanced english language course at The Institute of Linguistics, Russian Academy of Sciences. Advanced philosophy course at Institute of Philosophy, Russian Academy of Sciences.

KONSTANTIN NARKHOV

SPEAK

English: EFSET – Advanced/Proficient; CEFR – C1/C2

Polish: A2/B1

JOB/SKILLS

MultiSafePay:
backend developer

Ethelia Logging Solutuions:
founder & CTO

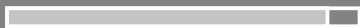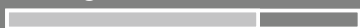**Scientific Research Institute of System Development:**
senior scientist

C

Perl

Linux: admin/setup/use

Linux: bash, awk, make

Linux: git, docker

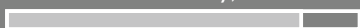**Linux:** gtk, glib, qt, eclipse

Blockchain: solidity, nodes

LANGUAGES

English: advanced level: reading articles & documentation, writing. Speaking at an intermediate level. Education at school, university and post-graduate (in general more than 10 years). I've passed an intensive 2-year training course "English First". EFSET — Advanced/Proficient, CEFR — C1/C2.

Polish: A2/B1 level. I've passed a 2-year training course at Polish Cultural Center in Moscow [5].

JOB

MultiSafePay
- June 2020 - present: backend developer.

Ethelia Logging Solutions
- Sept 2023 - present: founder, CTO.

Scientific Research Institute of System Development
- Sept 2005 - Aug 2009: engineer;
- Aug 2009 - Dec 2015: junior scientist;
- Dec 2015 - Mar 2017: deputy chief designer;
- Mar 2017 - May 2020: research fellow.

SKILLS

- High loaded backends in Perl;
- Software development for hard real-time embedded systems;
- Prototyping, specifying and developing low-level application data transfer protocols for real-time systems;
- System data transfer libraries development (for RT OS, libraries provide data transmission over high-speed channels: Ethernet, RapidIO);
- Unit tests development (for RT OS, performance tests for RapidIo, Ethernet, VGA, MIL-STD-1553, RS232 / 485, I2C, QBus, VME);
- Multi-threaded programming (POSIX.1-2008);
- Monitoring tools development (for multi-threaded applications that are running on multiprocessor /cluster systems);
- Visual environments development for Linux-like systems (glib, gtk, qt, plug-ins for Eclipse [6]);
- Parsers and text data analysis tools programming (C, Perl, Awk);
- Development, maintenance and support of compilation and assembly systems for distributed projects (make, automake, autoconf, kbuild);
- Decentralized Ethereum applications (smart contracts, backends and infrastructure);
- System monitoring and management via Telegram Bot API [47];
- Git & Continuous Integration (CI-scripts/tests, shared runners for Gitlab);
- Docker: OS-level virtualization containers, Docker-in-Docker.

KONSTANTIN NARKHOV

SENIOR DEVELOPER IN PROJECTS

Projects at MultiSafePay:

- Pay after Delivery (PAD) is unique after payment method provided for Dutch merchants. The product is fully developed by MultiSafepay. The online payment method allows online consumers to receive their order first and pay after [7];
- E-Invoicing is authentic, in-house developed solution for payment management. E-Invoicing is the most flexible and customer friendly ecommerce payment solution, designed for the B2B market [8];
- Buy Now, Pay Later (BNPL) is a type of short-term financing that allows consumers to make purchases and pay for them at a future date, often interest-free. BNPL has been one of the major trends in ecommerce. Added benefits for businesses are the lower cart abandonment rate and higher BNPL offering value [9];
- Installments have become a major target for innovation beetwen the providers that allow consumers to pay the order partially. It has allowed these services to become adaptable to many different websites and apps. MultiSafePay one of the first installments providers in NL and ES[10];
- Zinia BNPL platform: API integration with OpenBank. Zinia offers customers the opportunity to pay in interest-free instalments in a matter of seconds, either online or through physical points of sale [11].

Projects at Ethelia Logging Solutions:

- PM25.online — an alternative source of information about air quality, both indoors and outdoors, is provided by participants in this project who share data directly from their purifiers, sensors, or smart environmental control devices. Our project utilizes public decentralized storage on the Ethereum blockchain within the Holešky test network [48].

Projects at SRISA RAS:

- Automated generation utilities for real-time applications (AGURA) — certified visual environment for real-time applications development;
- Library for pipelined data transmition under RapidIO communication environment;
- Thread monitoring library for multi-threaded application runtime control;
- General multi-threaded programming technology for real-time OS;
- Supervisory control and data acquisition (SCADA) applications, utilities and service tools for prorgammable logic controllers (PLC);
- Remote prorgammable logic controllers (PLC) debugging and maintenance tools for AGURA IDE;
- Industrial automation with PLC: gas stations, oil pumping stations, telemechanics;
- IEC 61131-3 development environment implementation and maintenance: Beremiz IDE port for non-linux PLC backends (RTOS, barebones) [12];
- REST API services development for low-resource platforms (PLC, IoT, smart devices);
- System architect: environments with high-level decentralization (PLCs, OPC/IO servers, SCADA stations) and heterogeneous communication protocols;
- API libraries implementation and maintenance for industrial protocols: ModBUS, IEC 60870-5-101/102/103/104, EtherCat, OPC UA, NTP, MQTT, CAN [13].

KONSTANTIN NARKHOV

CONFERENCES

PRESENTATIONS

- Participation in Conference on Information Security Problems "Perspective-2009" [14], [15];
- Participation in Congress of young scientists of Russian Academy of Sciences [16];
- Participation in seminar "Design and Implementation Problems of Basic Hardware and Software" with a talk "Esterel SCADE — software development solution for real-time systems" [17];
- Participation in seminar "ARP 4754A & DO-178C Compliant Model Based System & Software Engineering" [18];
- Participation in 20th St.Petersburg blockchain community meetup with a talk "Private PoA networks on Parity Ethereum" [19];
- Participation in Swiss Perl Workshop 2019 with a talk "Pheix: Perl6-based CMS with data storing on blockchain" [20];
- Attending the Open Innovations Forum 2019, participant at session "MusicTech. AI - new big superstar" [21];
- Attending the Audio Developers Conference 2019 [22];
- Participation in German Perl Workshop 2020 with a talk "Querying the Ethereum blockchain nodes with Raku" [23];
- Participation in 26th St.Petersburg blockchain community meetup with a talk "Raku application: interacting with Ethereum network" [24];
- Participation in The Perl Conference in the Cloud 2020 with a talk "Creating secure decentralized content management systems on Ethereum blockchain with Raku" [25];
- Participation in FOSDEM21 with a talk "Programming Digital Audio Server (DAS) backend with Raku" [26];
- Participation in German Perl & Raku Workshop 2021 with a talk "Pheix CMS is β-released" [27];
- Participation in The Raku Conference 2021 with a talk "Multi-network Ethereum dApp in Raku" [28];
- Participation in FOSDEM22 with a talk "Decentralized Authentication" [29];
- Pitching at Startup World Cup Central Asia 2024 [49];

BLOGGING

POSTS

- Raku web templating engines: boost up the parsing performance: Raku Advent Calendar 2020 [30];
- A long journey to Ethereum signatures: Raku Advent Calendar 2021 [31].
- Trove – yet another TAP harness: Raku Advent Calendar 2022 [50];
- Dissecting the Go-Ethereum keystore files using Raku tools: Raku Advent Calendar 2023 [51].

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PAPERS

EXPERIENCE

RAKU

XML/XSD/SOAP

HTML/CSS3/JS

Bootstrap 5, MDL

MariaDB, PostgeSQL

PIC microcontrollers

Website Development
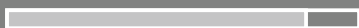
Ethereum Blockchain

SCIENTIFIC PUBLICATIONS

- Proceedings of the Conference on Information Security Problems "Perspective-2009". Volume 1, page 177 — "Programming in real-time systems: automation and security" [15];
- "Source code generator for real-time systems". Programmnye produkty i sistemy, № 4, pages 24–30, 2010 [32];
- "Techniques provided for valnerabilities reduction in special real time software". Programmnye produkty i sistemy, № 3, pages 89–95, 2012 [33];
- "Realization of controlled execution principle for realtime applications". Proceedings of SRISA RAS, Volume 5, №2, pages 113–121, 2015 [34];
- "Monitor Library for multi-threaded Programs". Proceedings of SRISA RAS, Volume 7, №1, pages 70–74, 2017 [35];
- "Handling exceptions using the monitor librarty". Proceedings of SRISA RAS, Volume 7, №4, pages 96–101, 2017 [36];
- "Software implementation of special IEC61131-3 data types at monitor library". Proceedings of SRISA RAS, Volume 8, №6, pages 66–74, 2018 [37].

ADVANCED SKILLS

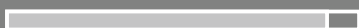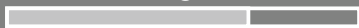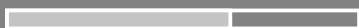- **Raku/Perl:** backends, parser development, practical modular development skills, OOP in Perl (native classes, Moose, Moo), unit testing, profiling, Selenium, static perlcritic analysis;
- **Raku/Perl:** acceleration & optimization of web applications — integration with Redis (basic skills in development for caching servers);
- **Raku/Perl:** content management systems — **Pheix** [38];
- **Raku:** developing and contributing modules: **Pheix**, **Net::Ethereum**, **Trove**, **Router::Right**, **LZW::Revolunet**, **Node::Ethereum::RLP**, **Node::Ethereum::Keccak256::Native**, **Node::Ethereum::KeyStore::V3**, **Bitcoin::Core::Secp256k1**, **Manifest::StopWar**, **Ethelia**, **HTML::Template**, **HTTP::UserAgent**, **MagickWand**, **Crypt::LibScrypt**, **Crypt::LibGcrypt**, **Dossier**;
- **XML, XSD, JSON**: writing parsers, development validation schemes;
- HTML5 / CSS3 / JS;
- **MariaDB, PostgeSQL**: support/administration/operation/SQL;
- **Front-end**: responsive layout with Bootstrap 5 [39] and Material Design Lite [40], Riot.JS, React and React Native;
- **Blockchain**: decentralized authentication [41];
- **Blockchain:** storage optimization [52];
- **Blockchain**: setup execution and consensus layers for Ethereum nodes (Görli with Beacon-Geth pair), Solidity smart-constracts, PoA networks deployment [42];
- Devices development (based on PIC microcontrollers by Microchip Technology Inc.): calculating electrical circuits, Hi-Tech PicC and MPAsm with MpLabX IDE, simulation in CAD Proteus, self-made circuit boards, board soldering skills, microcontroller programming skills: duty cycle, interrupt processing.
- Website development, layout & design at personal web-design studio [43];
- **GitLab**: support/admin/operation, CI/CD tools, runners, downstream triggers;

KONSTANTIN NARKHOV

HOBBIES

THESAURUS

FREE TIME

I'm a founder of **Condemned Cell** doom-metal band [44], also take part as a guitarist at Litia detah metal project [45]

Cars are my love! I'm blogging about repairs, cross-model fitments & car stories [46].

LINKS & CREDITS

1. https://dozen.mephi.ru
2. https://nick.mephi.ru
3. https://narkhov.pro/download/thesis/devel-hosting-platform-for-providers.final.pdf
4. https://goit.mephi.ru/090301
5. https://narkhov.pro/download/cert/polish/instytut-polski-w-moskwie-vse-certifikaty.pdf
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8. https://www.multisafepay.com/solutions/manage-invoices-and-subscriptions/
9. https://www.multisafepay.com/blog/buy-now-pay-later-the-future-of-online-payments
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16. http://www.ras.ru/digest/showdnews.aspx?id=d613b956-1829-439d-8432-52ea72a6ca96
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25. https://bit.ly/creating-secure-dcms-on-ethereum-blockchain-tpc20cic
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48. https://pm25.online
49. https://insidemongolia.mn/post/vuFM00YLRF7
50. https://raku-advent.blog/2022/12/14/day-14-trove-yet-another-tap-harness
51. https://raku-advent.blog/2023/12/18/dissecting-the-go-ethereum-keystore-files-using-raku-tools
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