

## Skills

**Most comfortable with** Solidity, Go, C, Javascript, Common Lisp, Forth, Emacs Lisp, Git, Linux  
**Have worked with** Java, Python, C++, Rust, Clojure, Erlang, PHP, Bash,  $\text{\LaTeX}$

## Projects

I contribute to a number of FOSS projects in varying degrees. Github and my homepage provides a fairly comprehensive overview.

### solipsism

*Common Lisp*

Static analyzer for the Solidity programming language. Aimed at audit and finding vulnerabilities in smart contracts.

### Expert system for job search

*Common Lisp*

An automated job analysis project that builds on my early research on expert systems.

### Forth VM Implementation

*Assembler; Forth*

Implementation of the Forth programming language and its Virtual Machine from absolute zero in assembler x86. Supports exceptions, object-oriented programming, system calls, and high-level Forth code decompilation. Contains a fortho-assembler.

### Literate Programming Tools

*Emacs-Lisp*

A set of Emacs utilities that extend Literate Programming methodology to Literate Project Management. Supports task management in the project source code, time tracking and bug tracking. Designed to replace heavyweight Issue trackers such as Jira.

## Experience

### Solution Architect at Insolar

*Jan 2020 - Jan 2021*

To visualize the algorithm of the Node's work, I wrote a translator from the Go code to the State Diagram for PlantUML. This state machine processed messages from other nodes. I have applied my experience in building compilers. As a result:

- Some bugs were found,
- The documentation has become easier to keep up to date,
- Accelerated architectural design: it was easier to reflect the changes on the diagram.

I have done architectural design for the Observer component. It is a several microservices that collects data from the blockchain network, aggregates it and provides it to web frontends. Frontends show our users transactions, account balances, and contract states.

For a startup, a patent portfolio is important - it affects the price of the possible sale of the company and the receipt of financing. I have patented architecture with a US patent attorney and have filed several patents.

### Independent Research

*Apr 2019 - Dec 2019*

- Independently designed and implemented my own blockchain system in Forth and Common Lisp aimed to Internet Of Things.
- Mentored a students who built a blockhains.

### Blockchain researcher, Core Blockchain Developer at Waves

*Sep 2018 — Dec 2019*

Waves is an open blockchain protocol and development toolset for Web 3.0 applications and decentralized solutions. The company is the largest developer of blockchain solutions in Russia.

The blockchain is written in Scala, the frontends are ModX, React, React Native.

Achievements:

- Developed a decompiler for Ride, the smart contract language on the Waves blockchain. It finds compilation patterns from bytecode and restores lost semantic constructs.
- I researched the possibilities of implementing NFT tokens and Curated List Registries on Waves blockchain.

- I wrote a number of tests and documentation.

### **System Architect at Enecuum**

*Mar 2017 - Sep 2018*

A blockchain startup in the post-ICO stage, is developing a blockchain project. Technology stack: Java, C++, Web, Mobile.

I had to deal with research, architecture design, hiring and training team developers, setting and monitoring the execution of tasks and many other things besides working with code.

I divided the efforts of the developers by creating four departments:

- Node developers
- Block explorer developers
- Mobile application developers
- Web developers

Each department had 6-8 people and 2-3 testers, about 40 people in total. I implemented scrum and wrote several utilities (in Emacs-Lisp) that track the progress of tasks (on a Gantt chart) and signal when they are behind schedule.

After the launch of TestNet, I developed the Virtual Machine for executing smart contracts.

Achievements:

- Launched the Test Network (400 nodes)
- Developed a virtual machine that executes smart contracts
- Made a compiler from Solidity-like high-level language into VM-bytecode.
- Trained team leaders in each department

### **Head of Development at Automaton**

*Dec 2015 - Mar 2017*

The company is engaged in the development and operation of automated parking lots. I led a research project to develop a new hardware and software parking system.

Technologies:

- PCB Design - Kikad, Altium Designer
- Programming: C/++, Assembler, Erlang (telephony), PHP/JS: Symfony + React (web interface), EmacsLisp - code generation for "executable specifications" and utilities for collaborative remote work in a team
- Architectural stack - Linux on ARM Cortex A8 and Symphony + React in the control interface.

The development was carried out from scratch, in stages:

- Hiring employees
- Selection of electronic components,
- Creation of printed circuit boards,
- Writing low-level code that controls barriers and polls sensors
- Writing business logic and web interfaces through which parking can be controlled remotely,
- Internet telephony connection to communicate with the parking client

The first implementation took place six months after the start of development, the development fully paid off in a year. The developed solution is ahead of the competitors.

- 2 design engineers (topologists) for the design of printed circuit boards
- 1 Linux kernel driver developer
- 3 Full stack web developers (PHP Symphony React)
- 2 Android developers
- 1 Ios developer
- 10-20 implementation engineers, installers, electricians (at the implementation stage)
- 4 QA specialists
- 1 3D artist
- 1 Erlang developer (telephony)

Achievements:

- Designed the hardware and software architecture of the paid parking automation system.
- Planned and organized software and hardware development work, including selection of electronic components and circuit design.
- Implemented business logic and presentation layer (Operator Workplace) on Symfony and React
- Supervised the implementation of the transport layer and the hardware abstraction layer (C/C++, kernel modules, device drivers)

- Organized parallel development on a modular basis to speed up product creation and kanban methodology
- Implemented Continuous Integration and Lifecycle Management Process (Releases, Bug Fixes, Feature Additions, Technical Quality Control, Automated Testing)
- Implemented secure (digital signature) and fail-safe (rollback to the previous version if tests fail) firmware update via the Internet.
- Automated documentation generation and storage using GIT based versioning and "executable specifications".

#### **TeamLead at BKN**

*Apr 2015 - Dec 2015*

The company is the second local real estate website. Receives income from advertising on the site and ads from the sale of real estate. Tech stack: C# and ASP.NET, ExtJs, 3 people were involved in development.

The site showed a decline in ad revenue for the six months before I joined the company. It was necessary to increase the resource in the subject and interest advertisers.

Achievements:

- Using the data of real estate agencies, I created a section on residential complexes and new buildings, which soon reached 60% of the site in volume, which allows you to dramatically increase advertising revenues on.
- Implemented on the site a section for the search and selection of apartments, rooms and residential buildings of the primary and secondary market, integrated it with the inter-agency database of real estate objects.
- Formed an SEO strategy for website development.

After the completion of the work, advertising revenue and traffic began to show steady growth.

#### **TeamLead at Trend**

*Feb 2014 - Mar 2015*

The company is a young fast-growing real estate agency specializing in new buildings. Tech stack: Php, Nginx, Mysql, PostgreSQL. Achievements:

I automated the business process of a real estate sales agency:

- Made an internal portal with a personal account of a realtor and the functionality of booking apartments
- Implemented automated setting of recommended prices and automatic selection of an object according to the criteria entered by the realtor

#### **Lisp|Erlang Developer at Algorithmic Trading Company**

*Apr 2012 - Feb 2014*

I have developed solutions in the field of electronic currencies based on Blockchain technology. Tech stack: Erlang, Common Lisp, C++

#### **Senior Developer at WizardSoft**

*May 2011 - Apr 2012*

The company is engaged in the automation of cost management in construction. Achievements:

- Developed a high-load web-portal for construction tenders. The prototype was implemented in Common Lisp, Postmodern and PostgreSQL. After acceptance, the prototype was significantly extended and rewritten in PHP

#### **Middle developer at TsiFri**

*Sep 2009 - Apr 2011*

The company is an online store. Tech stack: PHP, MySQL, JQuery, Common Lisp, Memcached. Achievements:

- I refactored the legacy code for high loads by introducing caching and using Common Lisp.

#### **Junior Web Developer at Webdom**

*Jan 2007 - Sep 2009*

Web Studio. Tech stack: Php, Nginx, MySQL. Achievements:

- Developed the framework on which the company now operates. CMS based on it are delivered to clients.

#### **Freelance programmer at Pochin**

*Sep 2005 - Jan 2007*

The company is an online store of car covers, auto parts and auto tools. Tech stack: Linux, Apache, MySQL, PHP

Achievements:

- Designed and developed an online store (three versions in a year and a half)