Rytis Karpuška

Address: Paukščių tako 72, Vilnius, LT12189
Date of birth: 1992-09-30
Phone.: +37061476947
E-mail: rytis.karpuska@gmail.com

About me

Since my childhood I was interested in exact sciences like math, physics, etc. When I was 11-12 years old, physics attracted me the most, however, over time, electronics became the most interesting branch to me. I started soldering simple devices like LED blinkers, audio amplifiers etc. Few years in, I came across microcontrollers and after writing my first assembler ”program” which was capable of turning on LED - I got hooked on programming. This was turning point in my life. Since then, I have been working on projects related to programming in professional and hobby settings constantly.

Education

2011 - 2015 University of Vilnius Bachelors degree in Software Engineering - University of Vilnius

First and second semesters - 90+% Average

2011 Andrew Ng online course ”Machine Learning”. *http://ml-class.org*

Professional experience

2011 - 2015 JSC ”Elektromotus”, Žirmūnų g. 68, Vilnius, Lietuva
Architect, Software engineer

2015 - now JSC ”Neurotechnology”, Laisvės pr. 125A, Vilnius, Lietuva
Software engineer

Projects

2007 Obstacle avoiding robot for ”Infobalt 2007” excibition.
http://blog.elektronika.lt/robotai/2007/10/28/reportazai-is-infobalt2007/

This is one of the most interesting works from my early ages. Robot was controlled by AVR ATmega microcontroller and had some IR sensors for obstacle detection.

Technologies: AVR, GCC.

2011 - 2012 Battery Management System ”Emus BMS”
https://emusbms.com/product-category/g1-control-unit

This Battery Management System is JSC ”Elektromotus” product. I was one of the main programmers of this system in 2011. One of the most notable uses of this system is ”ACCIONA” team in Dakar rally.

Technologies: AVR, svn, GCC, Linux, Qt4.

2012 - 2013 Electric "Smart fourtwo" conversion kit ECU.
http://grynas.delfi.lt/tv/lietuviu-perdarytas-elektromobilis-100-km-nuvaziuoja-uz-7-litus.d?id=61776195

During this JSC "Elektromotus" project electric conversion kit for "Smart fortwo" car has been developed. I have designed and programmed firmware for main ECU unit which controlled engine, gearbox, cooling and communicated to other systems over CAN bus.

Technologies: ARM-Cortex M3, Linux, GCC, git, CAN.

2014 - 2015 Sensor network for Norvegian railways contact wire monitoring.
https://www.sciencedirect.com/science/article/pii/S2214399816300121

During this JSC "Elektromotus" project a custom wireless sensor network system has been developed for acceleration and rotation measurements of contact wire. Due to high requirements for power consumptions - custom variable latency radio network protocol has been developed to allow radio hardware to be in low-power mode most of the time. Modified version of sliding window protocol has been impleneted to allow reliable data transmission over the network. Communication stack has been implemented in ARM Cortex-M3 and also as a linux kernel device driver. The whole system has the ability to be controlled over the internet.

Technologies: ARM-Cortex M3, Linux kernel device drivers, GCC, git, MEMS, 2.4Ghz radio, Raspberry pi, GSM, VPN, VPS.

2016 - now MegaMatcher Accelerator Cluster
https://www.neurotechnology.com/megamatcher-accelerator.html

During this JSC "Neurotechnology" project, large scale distributed biometric identification system was developed based on principles of Virtual Synchrony model and Neurotechnology's proprietary biometric algorithms. Linear scalability has been achieved in capacity and speed with cluster sizes up to 30 nodes. The cluster is capable of storing 160 million records (10 fingerprints per record) while matching at the speed of 300 million records per second when used without GPU acceleration. The system is a CP system which achieves sequential consistency on per subject basis at the cost of being unavailable if quorum is lost. Separate asynchronous replication protocol was implemented to provide weaker consistency guarantees, but achieve high availability.

Technologies: Linux, Docker, Kubernetes, helm, C++, mysql, corosync.

More notable contributions to open source projects

- **OpenAPI**

  Multiple contributions to OpenAPI C++ code generator:

  - `https://github.com/OpenAPITools/openapi-generator/pull/732`
  - `https://github.com/OpenAPITools/openapi-generator/pull/731`
  - `https://github.com/OpenAPITools/openapi-generator/pull/640`
  - `https://github.com/OpenAPITools/openapi-generator/pull/631`

- **Corosync**

  Multiple contirbutions to Corosync Cluster Engine:

  - `https://github.com/corosync/corosync/pull/335`
  - `https://github.com/corosync/corosync/pull/321`
  - `https://github.com/corosync/corosync/pull/320`
  - `https://github.com/corosync/corosync/pull/300`
  - `https://github.com/corosync/corosync/pull/297`

- **Zookeeper C++ client library**

  Multiple contributions to zookeeper-cpp library

  - `https://github.com/tgockel/zookeeper-cpp/pull/111`
  - `https://github.com/tgockel/zookeeper-cpp/pull/110`
  - `https://github.com/tgockel/zookeeper-cpp/pull/109`

- **Picom**

  Implementation of a new feature for X11 compositor which helps to lower eye strain

  - `https://github.com/yshui/picom/pull/247`

- **Googletest**

  Really small documentation changes to google testing framework:

  - `https://github.com/google/googletest/pull/2342`

Skills

- **Programming languages**

  Assembler, C, C++ - 4 years experience in professional environment, 8 years including hobby usage.
  Octave, Matlab, Python, Bash - Frequent usage for professional and hobby needs.
  Java, Ruby, html, css, sql, latex - Used for personal needs.

- **Other**

  Linux - 7 years usage for personal purposes, some experience in linux device drivers development.
  git, svn - 4 years profesional and personal usage.
  vim - 2 years profesional and personal usage.

Interests

- **Embedded systems, 3D graphics, machine learning;**
- **”Encounter” urban games;**