Miroslav Vitkov

Curriculum Vitae

Technical Skills

Major

* **C++14** under procedural, object oriented or functional paradigm
* **C11** for μC or ARM applications
* tools such as git, gitolite, cmake, teamcity, valgrind, clang-tidy, objdump

Minor

* **python**
* **bash**, the LFHS, standard utilities, security basics, UNIX sockets
* LaTeX
* basic electrical engineering - read a schematic, reason about it, use an oscilloscope, design a filter
* SQL
* ML - cross validation, ensembles, dataframes, measures of correctness, Markov processes, SVM

Misc

* **Haskell** - below junior level
* **regex** - for capture groups
* Autodesk **Inventor** - design a simple gearbox and simulate it
* **MatLab** - programming, SimuLink modeling
* **R** - for ggplot2
* avr-**asm**
* control theory - s-, z-transform, stability, pole placement, system identification
* red team - nmap, john, aircrack-ng
* blue team - apache, ufw, rkhunter, tcpdump

Communication skills

Bulgarian	C2: Native speaker
English	C2: Fluent (Cambridge CPE)
German	A1: Basic

❄ Aug 1988
✍ Sofia, Bulgaria
☎ +359 895 735 164
✉ sir.vorac@gmail.com

Education

2017 – 2019 **Machine Learning Scientist - dropped**
Cognitive Systems: Language, Learning and Reasoning
University of Potsdam, Germany

2007 – 2016 **Industrial Engineer**
Bachelor Thesis:
Multitasking Autotuning PID Controller in Heat Transfer Application
Technical University of Sofia

2008 – 2010 **Physicist - dropped**
Sofia University Kliment Ohridski

2003 – 2007 **Communications technician**
High school diploma
Technical School of Communications, Sofia

Projects on GitHub

C++ **face**
Use OpenCV Haar cascades to identify persons.

C++ **rocks**
Multiclass classification. Uses dlib.

C++ **silhouette**
Human silhouette extraction using HOG descriptor, SVM classifier and adaptive background thresholding.

C **micli**
MIcro CLImate controller, an autotuning PID regulator.

C **megaboot**
Simple atmega168 bootloader.

C **cgetset**
Generate getter/setter methods. Self-contained.

PYTHON **rat**
Encrypted chat infrastructure.

PYTHON **rtplot**
Realtime temperature plotting utility.

PYTHON **gender**
Guess the gender of the author of a short paragraph.

BASH **scripts**
Utilities for everyday use.

HASKELL **voiceid**
Identify different persons via speech.

LATEX **rpg**
A role-playing game.

INVENTOR **gearbox**
Gearbox calculation and technical drawings.

SELENIUM **sms**
Website scraper.

Work Experience

APR 2022 - JUL 2020

Allterco
Embedded

- Maintain code running in soft realtime in a custom OS.
- Develop BLE on ARM, which involves oscilloscope, logic analyzer , generated code, LED debugging.

FEB 2020 - JUL 2020

Smule
C++ Android algorithms

- Revive a legacy codebase (2000 line functions, zero documentation, no authors) but of significant business and engineering importance.
- Segment words from audio stream.
- Remain productive despite endless meetings.
- Write simple tools in python to parse logs and source code.
- Investigate crashes on Android devices.

JAN 2016 - SEP 2017

Euro Games Technology
C++ embedded Linux

- Maintain the layer just below Business Logic. Essentially encapsulate SDL2, OpenGL, Linux files, IPC, devices and network as to provide an API to internal clients.
- Bill accepting device user-space driver implementation from scratch.
- Script gitolite hooks and communicate their purpose to the other teams.
- Deliver a several months long project with minimal supervision.
- Animate custom fonts, draw values based on network updates.

MAY 2013 - MAR 2015

Antelope Audio
C++ ARM bare metal

- Implement a reverb in C++ on bare metal ARM.
- Design a GUI communicating with the device using pyQt.
- Implement dynamic bi-quad filter coefficient update as to respond to the user turning a knob.
- The filter representations in z-domain are combined to yield a frequency response graph.

- Develop USB2 Audio mode firmware for bare metal ARM.
- JTAG-and-scope debugging.
- Collaborate closely with teams of vastly different skill sets - HW engineers, audio engineers, visual artists.

FEB 2013 - MAY 2013

Johnson Controls

C embedded

Boolean algebra, concurrency, unit tests and documentation.

AUG 2011 - JAN 2013

MM Solutions

C++ Android algorithms

Digital video stabilization for the Android camera. By anchoring the feedback loop to the onboard gyroscope instead of to image features we achieved unparalleled real-time performance.