

# Miroslav Vitkov

## Curriculum Vitae

### TECHNICAL SKILLS

- MAJOR
- \* **C++14** under procedural, object oriented or functional paradigm
  - \* **C11** for  $\mu$ C 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
  - \* **TEX**
  - \* 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

✱ Aug 1988  
📍 Sofia, Bulgaria  
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### 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*

### COMMUNICATION SKILLS

BULGARIAN C2: Native speaker  
ENGLISH C2: Fluent (Cambridge CPE)  
GERMAN A1: Basic

## PROJECTS ON GITHUB

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C++	<b>face</b> <i>Use OpenCV Haar cascades to identify persons.</i>
C++	<b>rocks</b> <i>Multiclass classification. Uses dlib.</i>
C++	<b>silhouette</b> <i>Human silhouette extraction using HOG descriptor, SVM classifier and adaptive background thresholding.</i>
C	<b>micli</b> <i>Micro CLimate controller, an autotuning PID regulator.</i>
C	<b>megaboot</b> <i>Simple atmega168 bootloader.</i>
C	<b>cgetset</b> <i>Generate getter/setter methods. Self-contained.</i>
PYTHON	<b>rat</b> <i>Encrypted chat infrastructure.</i>
PYTHON	<b>rtplot</b> <i>Realtime temperature plotting utility.</i>
PYTHON	<b>gender</b> <i>Guess the gender of the author of a short paragraph.</i>
BASH	<b>scripts</b> <i>Utilities for everyday use.</i>
HASKELL	<b>voiceid</b> <i>Identify different persons via speech.</i>
LATEX	<b>rpg</b> <i>A role-playing game.</i>
INVENTOR	<b>gearbox</b> <i>Gearbox calculation and technical drawings.</i>
SELENIUM	<b>sms</b> <i>Website scraper.</i>

## WORK EXPERIENCE

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Total hired experience: exactly 6 years.

JUL 2022 - NOW

Independent Software Developer

### *Networking*

Developed and maintained an encrypted messaging application using Python, ffmpeg, and systemd supervision. Designed a public-facing web interface to expose project documentation, requiring robust security measures.

APR 2022 - JUL 2022

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 on-board gyroscope instead of to image features we achieved unparalleled real-time performance.