

# Zigmārs Rupenheits

## Curriculum Vitae

☎ (+371) 26291057  
✉ zigmarrs@gmail.com  
🌐 [linkedin.com/in/zrupenheits/](https://www.linkedin.com/in/zrupenheits/)  
🌐 [zigmars](https://github.com/zigmars)

### Career Objectives

Electronics and math enthusiast, analyst & problem solver seeking to deepen & apply knowledge of control theory, signal analysis, physics, computer science and math in practice by designing and developing useful electronic devices and software. Doing it in a systematic & structured manner. Constantly learning, striving for improvement in efficiency.

### Work experience

- 2019-present **Electronics engineer**, *Institute of Atomic Physics & Spectroscopy*.  
Medical device system architecture, electronics design & implementation + supervision of software and mech-hardware (case) design
- 2018-2019 **Embedded engineer**, *AERONES Ltd.*.  
Battery management system HW & FW troubleshooting, improvements and maintenance, creation of drone's electrical wiring documentation, troubleshooting of drone's altitude hold functionality
- 2014-2016 **Laboratory technician**, *Faculty of Physics & Mathematics, Nanoelectronics group*.  
Modelling and analysis of nonequilibrium quantum statistics of nanoelectronic devices
- 2014-2015 **Electronics engineer**, *Institute of Atomic Physics & Spectroscopy*.  
Hardware and firmware design and maintenance, support of electro-optical devices designed for biomedical measurements
- 2012-present **Leader/teacher of Robotics Club**, *Riga State Gymnasium No. 1*.  
Teaching basics of electronics & programming and designing DIY mini-sumo robots

### Education

- 2019-ongoing **B.S. in Electronics engineering**, *Riga Technical University*.
- 2016-2018 **M.S. in Theoretical Computer Science**, *University of Latvia*.  
**Subjects studied:** Design and analysis of fast algorithms, Number theory, Combinatorics, Graph theory, Probabilistic algorithms, Algorithm complexity, Mathematical methods of cryptography, Quantum computers, Deep machine learning, Digital design (FPGA programming).  
**Thesis (in Quantum computation):** *Exact quantum query algorithms using single-quantum-query subroutines*

- 2012-2015 **B.S. in Physics**, *University of Latvia*.  
**Subjects studied:** Classical mechanics, Electromagnetism, Optics, Electronics, Quantum physics, Linear algebra, Numerical methods, Calculus, Differential equations, Tensor calculus  
**Thesis (in Quantum mechanics):** *Modelling of nonstationary dynamics of electron wavepacket*
- 2009-2012 **Second. ed., Math & Physics emphasis**, *Riga State Gymnasium No. 1*.  
**Extra subjects:** C++ programming, Advanced high school computer science, Advanced high school physics, Robotics

## Technical Skillset

- Electronics** Part search, datasheet analysis, comparison;  
Board cost/reliability/product longevity/NRE cost optimization depending on requirements & production quantities  
Thermal, power design  
Low noise analog techniques  
ESD protection, EMI, RF basics  
Working knowledge of principles and operation of modern test equipment  
Altium Designer (2 y. experience)  
Eagle CAD (6 y.)  
System troubleshooting and debugging  
Basic FPGA programming
- Embedded** AVR & ARM GCC, Make, CMake, STM32 CubeMx  
Verilog
- Languages** C, C++ (11 y. experience)  
ARM & AVR-8 assembly  
Octave/MatLab  
Python  
Haskell  
Swift, Scala  
Web Tech fundamentals: HTML5, CSS3, JS, Ajax, PHP,  
basic use of various APIs, frameworks, such as Vue, jQuery
- Tools** Git, Vim, Unix, GNU/Linux standard CLTs  
MS Office, LaTeX, Markdown
- SW tech experience** Android app development & basic iOS app programming  
Supervision of Yocto, Qt, QML project  
OpenCV, TensorFlow
- Knowledge** Testing: unit, functional, integration  
Basic design patterns  
Debugging, troubleshooting
- 3D CAD** SolidWorks modelling (5 y. experience), OnShape

Model optimization for 3D printing  
Cartesian Bowden-tube 3D printer calibration

**Inter-personal** Eager to help others  
Cooperative, friendly  
Love to throw around ideas on strategies to improve systems or processes, discussing pros & cons with co-workers

**Languages** Latvian – native  
English – advanced (level C1)  
German – elementary (level A1)

## Electronic/embedded projects

CCD-line sensor reading prototype using ATMEGA328P  
Tone synthesizer and sequencer on STM32L476  
Motor control board implementing FOC (field oriented control) of a 3-phase PMSM (permanent magnet synchronous motor). A paused project.  
E-ink display driver board

## Personal projects

Well designed lab power supply (*PSL-3604*) build  
GPSDO setup for calibrating OCXOs  
Miniature (battery powered) 8x8 LED matrix badge HW + SW  
2-wheel balancing robot electronics design  
*Ultra-Micron* dosimeter build  
Card game *SET* for Android (JAVA)

## Hobbies and other interests

Reading about analog circuit design techniques  
Repairing electronic test equipment  
Taking electronic test equipment apart and reverse engineering it  
Solving math, algorithmic & physics problems  
Listening to jazz, classical and funk music  
Playing acoustic & electronic music