

ROMAN PIETRZAK

LEAD DEVELOPER
TECH LEAD
SOFTWARE ENGINEER

LOCATION, AVAILABILITY, UPDATES

Remote, London (south-west), Staines
Availability: few days
CV updated on 2020-10-10

CONTACT

Please go to this website before contacting me directly:
yosh.ke.mu/cv

20 YEARS IN SOFTWARE DEVELOPMENT

- **FULL STACK WEB-DEV** (18+ YEARS EXPERIENCE, EXPERT LEVEL)
 - **NODE.JS, JAVASCRIPT (ES6), WEBSOCKETS, GRAPHQL, REDIS, MONGO, MYSQL, SERVERLESS**
 - **REACT, VUE, ANGULAR, HTML 5, CSS/LESS/STYLUS, WebGL, SVG**
 - **DEV-OPS, AUTOMATION OF DEPLOYMENT, MONITORING, TESTING** (18+ YEARS EXPERIENCE)
 - **AMAZON CLOUD (AWS), DOCKER, HELM, KUBERNETES, LINUX**
 - **GRAFANA, PROMETHEUS, JMETER**
 - **TDD, DEVELOPMENT IN TEST (SDET), SELENIUM, KARMA, MOCHA, JEST, CIRCLECI**
 - **EMBEDDED SOFTWARE DEVELOPMENT EXPERT** (20+ YEARS EXPERIENCE)
 - **EMBEDDED, DIGITAL TV (STB), IOT, LINUX, BARE-METAL, ARM/CORTEX**
 - **C, QT, C++, JAVA, OPENGL**
 - **TECH LEAD/TEAM LEAD (2-20 PPL), STARTUP LEAD AND PROJECT MANAGER**
- ...more detailed info in "Skills & Experience" section on page #2

* INTRO *

**I LOVE DEVELOPING SOFTWARE, THEREFORE I OFTEN WORK ON FEW PROJECTS IN PARALLEL, SO SOME WORK OVERLAP.
PLEASE HAVE A LOOK AT YOSH.KE.MU/PORTFOLIO FOR MORE VISUAL CV**

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1 - CURRENT PROJECTS

- **MODUSBOX.COM** [2019 OCT - NOW] - LEAD DEVELOPER
 - Developing **MOJALOOP** - open source software for creating digital payments platforms that connect all customers, merchants, banks, and other financial providers in a country's economy
 - Working in performance optimization team: **Scaled & optimized** from 100 ops/s to 5k
 - Techs:
 - **BACKEND: NODE.JS, KAFKA, REDIS, MONGODB, MYSQL, HAPI, RDKAFKA(C/C++)**
 - **DEVOPS: AWS, DOCKER, KUBERNETES, MICROK8S, HELM, RANCHER, GRAFANA, PROMETHEUS, CIRCLECI**
- **CALCULLA.COM** [2015 - NOW] - WEB FULL-STACK TECHNICAL LEAD
 - I'm leading a team of developers in **AGILE + KANBAN**, re-building Calculla website in **NODE.JS** (IT WAS PHP BEFORE)
 - Huge web application, with 300+ different calculators
 - backend microservices supporting variety of bussiness domains (e.g. stock exchange and forex feeds, chemistry databases, math formulas etc.)
 - built on specialized OOP/MVC framework to support the size and performance of the project:
 - **SINGLEPAGEAPPLICATION** with heavy **WEBSOCKETS** utilization with fallbacks to **AJAX**
 - **NODE.JS + EXPRESS + JAVASCRIPT ES6/ES5/COFFEESCRIPT**
 - **NoSQL (MONGODB) + MYSQL** mix
 - **REACT.JS**-like rendering to **HTML 5 AND DOM AND SVG AND WebGL**
 - Multi-target rendering in **JAVASCRIPT** into browser DOM and server-side **HTML, XML, JSON**
 - **WebGL USED FOR WEB-DESIGN** and **COMPONENTS** - dynamic layout, gfx rendered by **WebGL + SVG** code
 - **STYLUS** for **CSS, TERSER AND BROWSERIFY** for minifying, **GULP** for build process - a webpack-like advanced toolset,
 - Automated testing: **TDD** with **SELENIUM, MOCHA, JEST** - we wrote and manage 22k tests !
 - **AWS, DOCKER, GULP, JAKE, BABEL, TERSER/UGLIFY, WEBPACK**

2 - SKILLS & EXPERIENCE (20+ YEARS)

WEB DEVELOPMENT (FULL STACK)

- front: **JavaScript (ES6), React.js, Vue.js, Angular**, CoffeeScript, **WebGL, HTML/CSS, Websockets, Ajax**, MVC frameworks, Canvas, jQuery, Stylus, Jake
- server-side: **Node.js, express.js, PHP**, Amazon Cloud (**AWS**), **MongoDB (NoSQL), Kafka, MySQL, C++**
- cross-browser development, browser internals, standards
- experience with non-trivial performance goals, examples:
 - website load below 50ms**
 - websockets** for all browser-server interaction
 - webGL** as layout/design renderer
- non-typical environments
 - QT**-extended webkit browser running on SetTopBox
 - web-API management for embedded devices like STBs, Raspberry Pi, etc.
- auto-tests: **Selenium, Jest, Mocha.js, node.js/python** scripted
- old-school: Flash, ActionScript - (2000-2006) experience in optimization of large ActionScript applications

GENERAL SOFTWARE DEVELOPMENT

- languages:
 - node.js, Javascript**, Typescript
 - C and C++** for embedded devices and desktop (PC)
 - Qt** is my thing, but worked with other frameworks too
 - DirectX** and **GL** experience
 - bare metal and drivers code
 - PHP**
 - Python** for scripting and TDD
 - Java** for PC, Set Top Box, mobile
 - assembler for x86, SH4, MIPS, ARM and old-school
 - old-school: C++ Builder, Pascal/Delphi, Basic, Amos, C64
- techs and tools:
 - automation, TDD/BDD, development in tests (SDET)**
 - GIT**, svn, cvs and code review tools,
 - cmake, makefile, continuous integration, Jenkins, ant, openSuse build system (obs),
 - JIRA, RTC, bugzilla
 - Kanban, Agile, Scrum

DEVOPS

- deployment **HELM, KUBERNETES, DOCKER, RANCHER, AWS**
- performance & monitoring **GRAFANA, PROMETHEUS, JMETER**
- scaling, sharding, partitioning, load-balancing – achieving high-scale performance goals
- security, SSL, HTTPS, X.509 certificates

EMBEDDED DEV

- BROADCOM AND ST SoC** for SetTopBox, from driver-level to GUI applications
- LPC CORTEX M0 PURE-C** bare-metal implementation, 1-Wire, RS485, RF, etc.
- RASPBERRY-PI**
- MINOR FPGA/VHDL**
- PC CARDS**

GFX RENDERING

- LOW-LEVEL:** framebuffer, blitter, freetype2, multi-core rendering,
- modern animated GUI frameworks, Qt – architect level
- OpenGL, **webGL, GLSL**, vertex/pixel/fragment shader, 2D/3D, DirectX,

SETTOPBOX & AUDIO/VIDEO

- all layers: applications, drivers, middleware (MHP, webkit)
- GUIs for SetTopBox: C/C++, Qt, GL (shaders), JavaScript (HTML) and Java (MHP)
- Digital TV specifics: mpeg, dvb-t, dvb-s, dvb-c, atsc, (de)multiplexers, PSI/SI, ETSI 300 468, CA, teletext, subtitles
- OS/21, linux, STAPI, Broadcom APIs
- DELTA CAST CARD:** SDI video analysis application - QT/GL

GUIs AND UIx

- GUI design with **procedural graphics and animation**
- QT/QML, GL, Java Swing, C++ Borland VCL, direct WinAPI and Flash (ActionScript),
- 2D/3D realtime charting of huge numerical databases (stock prices, government stats, company data etc.)
- embedded GUI design for SetTopBox

OTHER

- LOWLEVEL NETWORKING:** sockets, ipv6, http, https, ssl, curl, bson, **graphQL**, rest, RPC, winInet, wifi stack, RADIUS, QNetwork,
- WINAPI:** GDI, DirectX, WinInet, shell integration, system-services,
- DATABASES:** **SQL** and **NoSQL (mySQL, mongoDB)**
- LINUX:** gdb, kernel/drivers and user-space development,
- DISTRIBUTED PROCESSING** based on client-server-worker architecture, (**C++, Java, node.js, PHP**)

TECHNICAL EXPERIENCE SPECIFICS

- AUTOMATION IS KING:** Test Driven Development (TDD), Continuous Integration, test-racks, development tooling
- heavy understanding of multitasking, memory management, parallel processing, multi-platform messaging and synchronization etc.
- REBUILD FUNCTIONALITY WITH better performance, lower memory usage**, better resource managing etc. - struggling with performance? ask me for examples...
- SYSTEM ANALYSIS:** a lot of experience with analyzing architecture in multi-layer projects (from user application level and network services, through middleware, down to drivers level) to achieve extraordinary goals
- BUSINESS EXPERIENCE**
 - running a successful business in UK (KEMU STUDIO LIMITED) and Poland (KEMU STUDIO)
 - remote teams and cost/quality effective offshore teams
 - involved into cross-company projects – with a good sense of marketing-vs-technical goals
- HUMAN FACTOR (AKA "SOFT SKILLS")**
 - strong passion to IT - **I develop software a lot more than 8h/5d**
 - good team play, strong **team leading**, high culture of work,
 - strong understanding of whole **software development process**: define, develop, test, deploy
 - very good in documentation writing, I did many forms of knowledge sharing (coaching, mentoring)
 - open to new techs, languages, APIs, tools – happy to learn
 - good in R&D – ask questions, understand documentation, propose and execute tests to proof or negate concepts,
 - worked in multi-national teams. Have been working onsite in: Poland, UK, Germany, Netherlands, USA, Taiwan

3 - PROJECTS AS KEMU STUDIO

As Kemu Studio owner since 1996 I'm proud of my freelance work:

- delivered **100+ projects** for **EMBEDDED, IoT, WEB, SERVERS, CLOUD, DESKTOP AND MOBILE APPS, DATA PROCESSING&VISUALISATION, GAMES, AUTOMATION,**
- STARTED CALCULLA.COM AND CALCULLA.PL**
 - 150k+ unique users/month** from english and polish language base
 - sold/licensed calculators source code to external websites (infor.pl, wieszjak.pl and some minors),
- I'm **MANAGING** cost efficient business in two countries: UK (**KEMU STUDIO LIMITED**) and Poland (**KEMU STUDIO POLAND**)
- I'm **LEADING** devs, artists, testers and hardware designers, team-work in remote and non-remote basis
- freelancing for:
 - freelancer.com - **10/10 score points** in all contracts,
 - infor.pl - one of the largest law&economy portals in Poland – **JAVASCRIPT** programming

- dogo.pl - web studio – **PHP+JAVASCRIPT** websites and **C++** applications
- idownload.com - USA software reseller (non-existent currently) – **C++** applications with **DIRECTX**

4 - SOME EXAMPLE PROJECTS I'M PROUD OF

- **IN 2016 THE WEB GUI FOR EMBEDDED DEVICE (PROFESSIONAL DIGITAL TV RECEIVER)** - EXAMPLE MIX OF WEB+EMBEDDED
 - **TARGET IN 2016:** implement modern Web GUI on old embedded device from 2004
 - **LOOKS IMPOSSIBLE:** only 0.5MB free memory of 128MB total, no recent libraries support, **embedded** operating system (non-linux), C/C++ only, bare metal
 - **STEP #1:** reclaimed 6.5 MB by optimising graphics memory usage by direct use of hardware composer on CPU
 - **STEP #2:** used **NODE.JS** on PC to implement GUI (**HTML+JS**) itself with modern **JAVASCRIPT** libraries
 - **STEP #3:** implemented **JSON API** on HTTP socket in pure **C/C++** to allow **WebGUI** control
 - **STEP #4:** the website has been served in the form of "binary blob" through simplified **HTTP server** in **C/C++**
- **IN 2008 – 2014** – CALCULLA.COM – DEVELOPER OF JS-PHP FULL STACK (AND TEAM LEADER)
 - [HTTP://V1.CALCULLA.COM](http://v1.calculla.com) – ARCHIVED VERSION STILL AVAILABLE ONLINE
 - **70+ JAVASCRIPT** calculators for various purposes: TAXES, HEALTH, ELECTRONICS, ETC.
 - **PHP BACKEND + JAVASCRIPT/COFFEESCRIPT FRONTEND**
 - **MIX OF VARIOUS PHP FRAMEWORKS TO ACHIEVE PERFORMANCE GOALS: 40-60MS RENDERING TIME** OF WHOLE PAGE
- **IN 2015 THE CHROMA SAMPLING IN DIGITAL TV PROJECT** - AS EXAMPLE MIX OF C LOW-LEVEL DRIVER+FPGA+VIDEO PROCESSING
 - **PROBLEM:** no support for specific chroma sampling mode (mandatory for customer). CPU vendor says **"IT IS IMPOSSIBLE"**
 - **TOOL:** implemented benchmarking toolset in **QT (C++)** to prove the concept with use of OpenGL shaders
 - **SOLUTION: DESIGNED PRE-FILTER ON CPU (C/C++/MATH) TO CHEAT HARDWARE, THEN USED FPGA (VHDL) TO RECOVER ORIGINAL CHROMA SAMPLES FOR THE IMAGE**

5 - HISTORY OF PRIMARY OCCUPATION

- **SHUTTERSTOCK.COM** [2018-10– 2020-03] – FULL STACK LEAD DEVELOPER
 - I'm redeveloping admin application, leading 5-7 devs,
 - software stack for managing \$600M/year of sales,
 - moving from 15 years old Perl codebase to **NODE.JS** based microservices application
 - **NODE, REACT, VUE, GRAPHQL + APOLLO** (as gateway-API to microservices), **JAVASCRIPT ES6, JEST** (API + unit tests)
 - **DOCKER, KUBERNETES, HELM, JENKINS, AWS**
- **NODECTED.COM** [2016 - 2019] - EMBEDDED C & WEB FULL-STACK
 - Full product development and delivery for
 - **High Frequency Arbitrary Waveform Generator (up to 16 MHz, 14bit DAC, 256Msamples)**
 - Full stack from hardware to React:
 - **REACT.JS** based **GUI** connected by **WEBSOCKET** to API
 - **NODE.JS** server API
 - embedded controller (**ARM C**) with **BJSON** API on raw TCP sockets
 - **PCB AND HARDWARE DESIGN (ELECTRICAL)**
- **MINISTRY OF JUSTICE** [2018-08 - 2018-10] – INTERIM FULL-STACK TECHNICAL LEAD
 - I was leading a series of 1-3 week spikes, proving various tech solutions for building court digitisation platform
 - leading small team of developers in **AGILE + KANBAN** process,
 - **JAVASCRIPT ES6/ES5/TYPESCRIPT + ANGULAR + NUNJUCKS**
 - **TDD** driven development of gateway API with **NODE.JS + EXPRESS.JS + MOCHA + JEST**
- **CISCO/SKY - JAN 2017 - AUG 2018**
 - **SKYQ PROJECT** – WEB FULL-STACK ENGINEER & C/C++ DEVELOPER
 - **BIG-DATA WEB-APP** for stats/logs and management of stress-test racks for **160+ units**
 - Frontend with realtime-updates: **JAVASCRIPT ES6, REACT.JS, D3.JS CHARTS, WEBSOCKETS**
 - Backend: **NODE.JS, JAVASCRIPT ES6, C/C++** and **PYTHON**
 - Other techs: **JENKINS, LINUX**
 - **C/C++** code for **EMBEDDED LINUX SETTOPBOX, ARM** architecture for advanced SoCs from ST and Broadcom
 - embedded full stack development: linux drivers (**C**), Middleware stack (**C/C++**) and user SkyQ application in **C++/QT**
 - encrypted video/audio streaming over network to iPad/iPhone, Android and other STBs
 - **DEVELOPED THE AUTOMATIC TEST-STATION IN NODE.JS, JAVASCRIPT ES6 FOR IMPROVING THE DEV PROCESS**
- **XEROX (UK, POOLE) - NOVEMBER 2016 - DECEMBER 2016**
 - I developed browser APIs in **JAVASCRIPT ES6**
 - Testing with **KARMA, SELENIUM** in **NODE.JS**
 - **JAVA** as main backend server
- **ERICSSON (UK, SOUTHAMPTON) - APRIL 2014 – NOVEMBER 2016**
 - **DIGITALTV EMBEDDED SOFTWARE, WEB FULL-STACK AND SDET AUTOMATION** Consultant
 - I developed new web interface using: **NODE.JS, REACT.JS, JAVASCRIPT, HTML, JSON API**
 - I developed major Digital TV features on embedded level
 - **C++** in application and server code
 - **LOW-LEVEL/DRIVER CODE IN C** for video filters, graphics rendering (blitter, compositor), ST CPU drivers
 - **DIGITALTV SPECIFICS:** osd graphics, teletext, subtitles, resolution scaling (SD/HD/1080p), DVB SI/PSI
 - **AUDIO/VIDEO DECODING:** IP/UDP, MPEG2/H264, SDI-SD/HD/3G, 4K
 - some **FPGA/VHDL** debugging
 - I made a lot of **AUTOMATION** of development and auto-tests, **TDD – NODE.JS, MOCHA.JS, PYTHON**
 - **C++/QT/GL:** PICTURE QUALITY ANALYSIS/COMPARISON TOOLS, GUI-S FOR SOFTWARE TOOLS
- **SKY (UK, LONDON) - AUGUST 2013 – MARCH 2014** – software engineer
 - new Set Top Box application development: SkyQ, Ethan
 - modern animated GUI from scratch, **QT/GL** driven, performance focused, user input method innovations
 - **QT, C++, openGL (pixel shaders)**, optimisation of rendering in embedded openGL,
 - Digital TV specifics: **MPEG SI/PSI, DVB-S SI** models, MVC,
 - **TDD, automation**, unit tests, scrum, jira, svn, git,
 - **node.js, JavaScript** for internal website tools
- **PACE (UK, LEEDS) - JANUARY 2013 – AUGUST 2013** – software engineer in **Pace**, UK, Saltaire (Bradford/Leeds area),
 - Set Top Box software development – embedded, api-server and web-browser,
 - main tasks:
 - implement and deliver software with customer requested features and fixes in **agile/scrum** based sprints,
 - issue identification, debugging, problem solving, tests on-site,
 - **test farms:** introducing **Test Driven Development** into existing software creation process, system & stability tests implementation

- multi-site cooperation: Saltaire (UK), Helsinki (Finland), Warsaw (Poland) and France,
- **techs:**
 - **C, C++, QT, QML**, svn, cvs, gstreamer, DVB, MPEG SI/PSI, scanning/tuning, Conditional Access, Nagra, Dbus, network PVR, gdb, **TDD**, multi-threading, dmalloc, DVB-C, DVB-T,
 - portal integration: VOD, QT webkit plugins, **JavaScript API, HTML5, CSS**, javascript portals code verification,
 - remote test-farm automation on customer's site: python, bash, ssh, scripting,
- **ADB - AUGUST 2012 - DECEMBER 2012 - Senior Software Engineer in Advanced Digital Broadcast**, Poland
 - webkit browser integration into STB stack: **C/C++, QT**, http/https, embedded linux, optimization, tests, makefile,
 - web-portals for STB (VOD services, video/audio libraries, YouTube TV/Leanback etc.): frontend, **HTML5, JavaScript, Qt** webkit plugins, external APIs integration,
 - more techs: git, Gerrit, svn, auto-build, auto-test, TDD,
- **CODEPROJECT.COM - MARCH 2012 - JULY 2012 - developer/architect** for CodeProject.com (Canada)
 - remote team in Zielona Góra (west Poland)
 - project description and goals
 - **launched a team** located in Poland dedicated for project,
 - designed & deployed high-volume web application (8M+ users) on **AWS Cloud**
 - **NODE.JS/EXPRESS** servers as core API, Ruby On Rails servers as application server, **MONGODB** as databases, cache by Redis, external applications by pub-sub style API with elements of **OAuth** authorization,
 - parts of common code for browser and server based on **JavaScript/CoffeeScript**,
 - heavy user-team, rights-roles, access-lists based environment, messaging, advanced payments management,
 - **TDD/BDD** driven,
 - main tasks:
 - **webservice API** definition, backend implementation (**nodeJS**), databases structure (**MongoDB**), frontend integration,
 - distributed system architecture design (API servers load balancing, databases sharding, external apps API, worker queues),
 - core API implementation in CoffeeScript for node.js server,
 - **auto-tests suite (1k+ tests)** design and implementation – mostly Mocha based (mixed TDD/BDD style),
 - **team leading (3 people)**,
- **TIETO - JUNE 2011 - MARCH 2012 - Lead Software Engineer in Tieto Poland** (Wroclaw, south-west Poland)
 - Main tasks:
 - Design and implementation of software architecture and automated system/unit tests,
 - Team leading related tasks, including knowledge exchange, coaching, etc.
 - Significant projects:
 - **NOVEMBER 2011 - FEBRUARY 2012 (4 MONTHS) - Nokia** (Ulm, Germany)
Wifi and mobile 2G/3G internet connectivity middleware:
 - **C++, Qt-Network**, linux, connman, git,
 - system tests design and implementation, **TDD** introduction,
 - Wifi and 2G/3G test farm: architecture and implementation,
 - **C++/curl** implementation of controllers for access points from different vendors (DLink, Linksys, Cisco, etc.)
 - **team leading for system-test group**, multi-site coordination, multi-language team, scrum driven,
 - **AUGUST 2011 - OCTOBER 2011 (3 MONTHS) - Digital Route** (digitalroute.com):
Scalable, high performance distributed data processing in MediationZone – mostly related to intergration of multi-vendor 2G/3G billing systems:
 - **Java and APL** development, unit & system tests,
 - **distributed execution**: software auto-versioning, distributed configs, fault-control, etc.
 - performance oriented development,
 - team leading for 2 teams (development and test),
 - **JUNE 2011 - JULY 2011** – application and middleware development for STB (HDTV, QT, GUI, SH4, MIPS),
- **ADB - AUGUST 2005 - MAY 2011 - Software Developer in Advanced Digital Broadcast** (ADB Poland).
 - based in Zielona Góra, west Poland,
 - Overview:
 - Set-top box embedded code: **C, C++, Java (MHP), SH4 (RISC), Broadcom (MIPS) assembler**,
 - PC-based tools for automation and optimization of development and testing process: **C++, Java, PHP, svn, ant**,
 - Software architecture design, implementation, unit/system tests, **TDD**,
 - development on different layers:
 - **GUI applications (Java/C)**, user experience, GUI composition toolsets,
 - **middleware (OpenTV, MHP)** and porting layers, high-level subsystems/services,
 - **drivers** (native os, linux kernel),
 - Significant tasks, projects, experience
 - GUI related
 - good understanding of animation, graphical effects, pixel-level math, alpha blending, scaling, tap-filtering, shading, etc.
 - in cooperation with internal and external art designers implemented many good "look & feel" applications for several STB vendors mostly in UK, Norway, Italy, Switzerland, Spain, USA and Poland,
 - developed core architecture & implementation of cross-platform graphical stack for **HighDefinition TV** devices, including **drivers, PIL layers, MHP (Java)** and native API's, as well as user front-end application design,
 - development related to HighDefinition TV: **32-bit graphics, HD resolution, HDMI/HDCP** support,
 - designed and implemented fonts system (based on **freetype2 rendering**), image decoding (**png/jpg/svg**) and widget rendering (proprietary) subsystems,
 - good understanding of **graphic-related hardware** (blitters), implemented drivers for ST7100 and 7109 chips blitter (kernel-space and user-space), also some development for Broadcom blitters,
 - STB related
 - **DVB SI (Service Information)** scans and monitoring for terrestrial (DVB-T), satellite (DVB-S) and cable (DVB-C) environments, with country-specifics for Italy, Norway, Spain, Switzerland and UK,
 - digital television specifics: electronic program guide (epg/event information), parental control, languages selection for audio and teletext, hard-of-hearing, power saving modes,
 - good understanding of dvb/mpeg related processing with on-chip acceleration (transport stream parsing, demux, dma),
 - performance tuning, memory usage profiling, multi-threading, multi-level optimization of software stacks,
 - web-services intregation (VOD, remote recording, browser integration etc.),
 - cross-platform development, including web-servers and mobile integration into SetTopBox services,
- **2000-2005** - network administration of 80-100 workstation-sized network in technical education unit (ZSTiO school in Zielona Góra). Main tasks:

- network maintenance: Windows Advanced Server Domain, Linux servers, routers etc.
- development and maintenance of databases, software tools and website (**C/C++/PHP**)
- lot of teampay: introducing IT to non-IT people
- **1999-2000** – local McDonald's
 - my first real job with a lot of team-play :)

6 - EDUCATION

- University of Zielona Góra - 5 years of university level education, **Master's Degree in Software Engineering**
- Electronics & IT School in Zielona Góra - 5 years of secondary school, **Technical Degree in Computer Systems**