

# ROMAN PIETRZAK

TECH LEAD  
SOFTWARE ENGINEER

## LOCATION, AVAILABILITY, UPDATES

London (south-west), Staines  
Availability: 2 weeks  
CV updated on 2019-07-01

## CONTACT

Please go to this website before contacting me directly:  
[yosh.ke.mu/cv](http://yosh.ke.mu/cv)

## 20 YEARS IN SOFTWARE DEVELOPMENT

- **FULL STACK WEB-DEV EXPERT** (18+ YEARS EXPERIENCE)
  - **NODE.JS, PHP, JAVASCRIPT (ES6), WEBSOCKETS**
  - **REACT, VUE, ANGULAR, HTML 5, CSS/LESS/STYLUS, WebGL, SVG**
- **EMBEDDED SOFTWARE DEVELOPMENT EXPERT** (20+ YEARS EXPERIENCE)
  - **EMBEDDED, DIGITAL TV (STB), IOT, LINUX, BARE-METAL, ARM/CORTEX,**
  - **C, QT, C++, JAVA, OPENGL**
- **DEV-OPS, AUTOMATION, TESTING** (18+ YEARS EXPERIENCE)
  - **TDD, DEVELOPMENT IN TEST (SDET), AUTOMATION, SELENIUM, KARMA, MOCHA, JEST, PYTHON**
  - **AMAZON CLOUD (AWS), LINUX**
- I have experience as **TECH/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](http://YOSH.KE.MU/PORTFOLIO) FOR MORE VISUAL CV**

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## 1 - CURRENT PROJECTS

- **CALLULLA.COM** [2015 - NOW] - WEB FULL-STACK TECHNICAL LEAD
  - I'm leading a team of developers in **AGILE + KANBAN**, re-building Callulla website in **NODE.JS** (IT WAS PHP BEFORE)
    - Huge web application, with 200+ different calculators - with backend microservices supporting variety of bussiness domains (stock exchange 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**
    - Automated testing, **TDD** with **KARMA, SELENIUM, MOCHA**
    - **AWS CLOUD, GULP, JAKE, BABEL, UGLIFY, WEBPACK**
- **SHUTTERSTOCK.COM** [2018 - NOW] - FULL STACK DEVELOPER + LEAD
  - I'm redeveloping admin application for internal use:
    - 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)
  - basic use of **DOCKER, KUBERNETES, JENKINS, AWS**
- **NODECTED.COM** [2016 - NOW] - EMBEDDED C & WEB FULL-STACK
  - Full product development and delivery of High Frequency Arbitrary Waveform Generator (up to 16 MHz, 14bit DAC, 256Msamples)
  - **PCB DESIGN** (electrical), embedded controller (**ARM C**) with **BJSON** API, **NODE.JS** server API and **REACT.JS** based **GUI**

## 2 - SKILLS & EXPERIENCE

### 20+ YEARS IN SOFTWARE DEVELOPMENT

- **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
- **node.js**, 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

### 18+ YEARS IN 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)**, **MySQL**, **C++**
- cross-browser development, browser internals, standards
- experience with non-trivial performance goals, examples:
  - **website load below 50ms**
  - **websockets + ajax** 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**, **Mocha.js**, **node.js/python** scripted
- old-school: Flash, ActionScript - (2000-2006) experience in optimization of large ActionScript applications

### 10+ YEARS IN 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

### 10+ YEARS IN 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**

### 14+ YEARS IN 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,

### 15+ YEARS IN GUIs AND UIx

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

### 15+ YEARS OF GENERAL DEVELOPMENT

- **automation**, **TDD/BDD**, **development in tests (SDET)**
- **GIT**, svn, cvs and code review tools,
- cmake, makefile, continous integration, Jenkins, ant, openSuse build system (obs),
- bugzilla, JIRA, RTC
- Kanban, Agile, Scrum

### OTHER

- **NETWORKING**: sockets, ipv6, http, https, ssl, curl, 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**)
  - **MEDIATIONZONE (DIGITALROUTE)** – Java based analysis of mobile traffic logs,
  - auto-adaptive and genetic evolution based computations for stock exchange/forex – **Java**,

- **TECHNICAL EXPERIENCE SPECIFICS**
  - **AUTOMATION IS KING**: Test Driven Development (**TDD**), Continous Integration, test-racks, development tooling
  - heavy understanding of multitasking, memory management, paralell 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 bussiness 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/background 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 bussiness 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 DIGITALTV 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

- **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**
- **JAN 2017 - AUG 2018 – CISCO/SKY**
  - **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**
- **NOVEMBER 2016 - DECEMBER 2016 - XEROX (UK, Poole)**
  - I developed browser APIs in **JAVASCRIPT ES6**
  - Testing with **KARMA, SELENIUM** in **NODE.JS**
  - **JAVA** as main backend server
- **APRIL 2014 – NOVEMBER 2016 – ERICSSON (UK, Southampton)**
  - **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
- **AUGUST 2013 – MARCH 2014 – software engineer in Sky (BskyB), UK, London,**
  - 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
- **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,
- **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,
- **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)**,
- **JUNE 2011 – MARCH 2012 – Lead Software Engineer in Tieto Poland** (Wrocław, 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),
  - **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 teamwork: 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**