

Roland Bogosi | Curriculum Vitæ

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"Knowing is not enough; we must apply. Willing is not enough; we must do." - Johann Wolfgang von Goethe

Education

Sapientia EMTE, Faculty of Technical and Human Sciences

Târgu-Mureş

B.Sc. Computer Engineering

September 2012–July 2016

Gave multiple presentations in various fields; attended both XIV. and XV. Scientific Students' Associations Conference with projects which separately won awards; participated in three research groups as an extracurricular activity; doing thesis in the field of Information Security.

Experience

BrightAlien Ltd

London (Remote)

Full-Stack Developer

December 2013–December 2015

Developed 9 websites plus an internal dashboard; installed, administered and proactively monitored various Linux and Windows-based cloud server instances; ensured stability, uptime and performance on a site with a peak of 15M unique users.

Lynx Solutions SRL

Târgu-Mureş

Android Developer Internship

July 2014–August 2014

Wrote full application specification document; single-handedly developed the documented Android-based application with UI accommodating both smartphones and tablets alike; oversaw fellow interns through their journey of implementing the documented REST API.

Certifications

IPv6 Certified Sage, Hurricane Electric

March 2011

Publications

Sapiness Sentiment Analyser: Katalin Tünde Jánosi-Rancz, Zoltán Kátai and Roland Bogosi; *Acta Universitatis Sapientiae, Informatica*, vol. 7, no. 2, pp. 186–199, 2015.

Awards & Honors

XV. Scientific Students' Associations Conference

April 2016

Black-Box Penetration Testing and Autonomous Vulnerability Assessment

XIV. Scientific Students' Associations Conference

April 2015

Sapiness Sentiment Analyser

Languages

Hungarian: Native proficiency

English, Romanian: Full professional proficiency

Technical Skills

Languages: C# (10 years), Java (9 years), C/C++ (8 years), Go, Python, PHP (12 years), JavaScript, SQL

Libraries: STL, Boost, Qt, MFC, Swing, WinForms, WPF, C++/CLI, NUnit, jQuery, Bootstrap, Angular.js, PHPUnit...

Technologies: Android, Android NDK, Debian, CentOS, BSD, nginx, Apache, HHVM, exim, Postfix, Redis, memcached, Elasticsearch, Sphinx, MySQL/MariaDB, SQLite, Oracle, SOAP, JSON, Google ProtoBuf, XDebug, OpenVPN, L2TP/IPSec, Radius/LDAP, Tor/I2P, Meshnets, Google AppEngine, Amazon AWS/Linode/DigitalOcean, CloudFlare/Incapsula, NSIS, InnoSetup, WiX, MSTest, dotCover, dotMemory, dotTrace...

Fields: Penetration testing, Reverse engineering, System administration, Shell programming, Task automation, High availability (Load-balancing, TTFB optimization...), Software performance, Server/software security, Data encryption, Networking, Screen scraping, Testing, Search engine optimization (SEO), Continuous Integration

Personal Development

- **10 years** of experience in **.NET/C#**.
 - First exposure to object-oriented programming in **Visual Basic .NET**, then **C#**, via the .NET framework at the age of **13**.
 - Published first **desktop application**, which implemented an *original idea*, at the age of **13**, which utilized **databases**, **regular expressions**, **networking** and **screen-scraping**. Application was published to **Softpedia**, where it was accepted and reviewed by their staff, leading to a few hundred downloads during its lifetime.
 - Use of **neural networks**, in order to train a software to **recognize** numbers and letters that appear on a **webcam**-provided image in real-time, at the age of **16**.
 - Published first **open-source application** at the age of **16**, which then went **commercial** at the age of **18**, by integrating serial numbers generated and validated using **RSA public-private key encryption**, which were released by a **PHP script** called by either **PayPal Instant Payment Notification API** or the **Bitcoin API**.
 - Experience with **NSIS**, **InnoSetup**, and **WiX**, including scripting of custom methods.
 - Extensive knowledge of **Test-Driven Development** via leading **unit test libraries**, such as **NUnit** and **MSTest**.
 - Extensive experience with various development tools, used to:
 - profile and **analyze unit test coverage**, such as **dotCover**;
 - profile, detect and **mitigate memory leaks**, such as **ANTS Memory Profiler** and **dot-Memory**;
 - profile, detect and **mitigate performance bottlenecks**, such as **ANTS Performance Profiler** and **dotTrace**.
 - Various short-term hobby projects along the time driven by the desire to learn and experiment in various fields, thus expanding my experience and increasing my knowledge of various algorithms, frameworks, and my programming ability as a whole.

- **8 years** of experience in **C/C++**.
 - First exposure to unmanaged programming at the age of **15**.
 - Extensive use of the UI libraries **Qt** and **MFC**.
 - Experience with **cross-platform** software development on **Windows**, **Linux**, **FreeBSD** and **Mac OS X** platforms, including usage of OS-specific component implementations, such as differing network stacks on the lowest level.
 - Usage of **qmake**, **CMake** (and its components **CPack** and **CTest**) to build, test and package software for distribution on multiple platforms.
 - Unit-testing with **Boost.Test** and **Google Test**, including mocking with **Google Mock**.
 - Experiments with massively parallel systems, such as **OpenCL** and **nVidia's CUDA**, which are **GPU-backed** languages. Frequent use of **OpenMP** and projects with **MPI**.
- **12 years** of experience in **HTML**, **CSS**, **JavaScript**, **PHP** and **MySQL**.
 - First exposure to the world of programming via **PHP** at the age of **11**.
 - Published first dynamic webpage written from scratch at the age of **12**.
 - Received first \$100 check from **Google AdSense** at the age of **14**.
 - Developed first **autonomous web-services** that rely on user-contributed data at the age of **17**. Aforementioned web-service is a **recommendation system**, which provides **tailored recommendations** based on a user's preference list.
 - Up-to-date knowledge of **HTML 5**, **CSS 3**, **PHP 7/Hack**, **JavaScript**, and **SQL** as of today.
 - Extensive knowledge in the use and production of **REST APIs**, **OAuth**, **OpenID** and **SOAP**, also having experience in **data-interchange formats**, namely: **JSON**, **XML**, **Google Protocol Buffers**, **BSON**, and various others.
 - Knowledge of various **SQL flavors**, in order of skill level: **MySQL**, **SQLite**, **Oracle**, **PostgreSQL** and **Microsoft SQL Server**.
 - Extensive knowledge of **optimization and caching mechanisms**, including the optimization of **relational databases** (**query plans**, **indices**, **complexities**, ...), **key-value stores** (such as **Redis** and **memcached**). **Multi-tiered caching systems**, utilizing the aforementioned technologies, with a fallback to file-based **LRU caches**. Brief exposure to **document stores**, namely **MongoDB** and **CouchDB**.
 - Extensive exposure to **dedicated search servers**, namely **ElasticSearch** and **Sphinx**, including both their programmatic use and proper server configuration.
 - Experience with **jQuery**, **semantic web** and **dynamic webpages**, utilizing **AJAX** and **JavaScript "MVW"** frameworks, namely **Angular.js**.
 - Experience with **Bootstrap**, and **grid-based fluid** and **responsive web design**.
 - Familiarity with **Model-View-Controller (MVC)** architectures.
 - Extensive experience with **test-driven development** via **PHPUnit**, and the use of various development tools, such as **performance profilers** and **remote debuggers**, namely **XDebug**.
 - Experience with both **horizontal** and **vertical scaling** of both **databases** and **codes**.
 - Familiarity with the integration and implementation of various **payment gateway processors**, such as **PayPal IPN**, **Stripe**, and **Bitcoin RPC**.
 - Intricate knowledge on the **security** front, and up-to-date on the **0-day scene**. While programming, I have a **security- and optimization-focused** mindset.
- **8 years** of experience in **Unix-like systems (Linux, BSD)**
 - Installed first **Linux distribution** at the age of **14**.
 - Flashed first router with **OpenWRT** and **DD-WRT** at the age of **15**.

- Got the task of configuring and managing **unmanaged VPS** instances at the age of **15**.
- Installed **Linux from Scratch**, at the age of **16**.
- Obtained first certificate **IPv6 Certified Sage** from Hurricane Electric at the age of **18**.
- Extensive knowledge of the **Linux** ecosystem as of today. Personally owning and administering multiple production and staging servers, while providing support for others on an incident-response basis.
- Early adopter on multiple fields, including **IPv6**, having been participated in the **private beta** of the IPv6 deployment of both **RDS&RCS** and **Dreamhost**. The configuration and use of **IPv6 networking** was the primary reason to stay with **OpenWRT**-flashed routers in the first place, as it was not yet available in consumer firmware due to the low technology adoption rate at the time.
- Tendency to **automate tedious processes**, by **scripting them** in the appropriate environment. (Such as **shell scripts** in **Unix** and **Unix-like systems**.)
- **Strong Bash scripting** experience, including **heavy terminal usage**, and heavy knowledge of the **BSD** and **GNU userland tools**.
- Ability to configure, administer, update and support **Debian** and **CentOS**-based systems for various purposes:
 - Web servers: **nginx**, **lighttpd**, **Apache**, with fast and secure configurations, including **caching** and **microcaching** techniques, on-the-fly optimization with **Google PageSpeed** modules; **Web Application Firewall** security modules, such as **mod_security** and **mod_evasive**; proper deployment of **TLS** according to best practices and high **Qualys** scores or compliance with **PCI DSS 3.1** or **NIST SP.800-52r1**; load-balanced environments, including various internal architectures and 3rd-party CDN integration (**CloudFlare**, **Incapsula**...)
 - Email servers: **exim**, **Postfix**, **Dovecot**, with proper deployment of current authentication methods for anti-spam such as **SPF** records, **DKIM** (DNS records and signing at the mailer daemon level), **DMARC** (DNS records and interpretation of the incoming reports) and **ADSP** records.
 - Database servers and various stores: **MySQL** (and forks, namely **MariaDB** and **PerconaDB**), **PostgreSQL**, **Redis**, **CouchDB**, **memcached**, etc.
 - Search servers: **ElasticSearch**, **Sphinx**, with optional content synchronization.
 - Proxies and VPN servers: **OpenVPN**, **L2TP/IPSec**, **PPTP** protocols, through various daemons which the selected distribution recommends, including multi-functional servers, such as **SoftEther**.
 - Authentication servers: **FreeRADIUS**, **OpenLDAP**
 - Type-1 hypervisors: **VMware ESXi**, **Microsoft Hyper-V**
 - Experience with **hidden services**, namely **Tor** and **I2P**, including configuring the **middleware** and securing the servers behind it not to leak personally-identifiable information.
 - Exposure to **meshnets**, such as the **Hyperboria network** on the **CJDNS**.
- Extensive experience with **cloud-service providers**, namely **Amazon AWS**, **Linode**, and **DigitalOcean**. Exposure to **Microsoft Azure** services.
- Extensive experience in **Penetration Testing** and **Reverse Engineering**
 - **Penetration Testing**
 - Up-to-date with **security bulletins**.
 - Knowledge of **Cross-Site Scripting**, **SQL Injection**, **Cross-Site Request Forgery** and similar techniques from a very young age, around **11** or so.
 - Familiarity with **Black**, **Grey** and **White Box Penetration Testing** methodologies.

- Experience with vulnerability assessment tools **Nessus**, **Nexpose** and **OpenVAS**, including interpretation of results, vulnerability validation and elimination.
- Extensive use of penetration testing frameworks and tools such as **Metasploit**, **nmap**, **tcpdump**, **OWASP ZAP**, **Burp Suite**, **sqlmap**, and many others.
- Familiarity with **Web Application Firewalls** and **Intrusion Detection Systems**, techniques to bypass them, and to strengthen them for different purposes.
- Notified university of being **vulnerable to OpenSSL's heartbleed bug**, approximately 5 hours after the public disclosure of the bug.
- **Reverse Engineering**
 - Experience with **disassembling**, **modifying** and **reassembling MSIL/CIL**, **Java bytecode** and **x86(-64) ASM**.
 - Familiarity with the tools and techniques used in **reverse engineering**, such as:
 - Debuggers: **WinDbg**, **OllyDbg/Immunity Debugger**.
 - Disassemblers/Decompilers: **IDA Pro**, **Reflector**, **JD**, amongst others.
 - Various file format/PE analysis tools, packer techniques and anti-virus evasion.
- **Screen-Scraping**
 - Strong knowledge of **regular expressions** and **XPath**.
 - Complicated setups involving scripts that circumvent anti-screen-scraping measures, even to the point of **OCR-ing** the Captcha, when it is weak enough, otherwise using the human-powered services available on the markets.
- **Search Engine Optimization**
 - **Google Panda**-tailored optimizations that have proven their legitimacy throughout the various websites I operate.
- **Version Control Systems**
 - Extensive use of **git** nowadays.
 - Previously used **SVN**.
 - Familiarity with other VCSs, such as **Mercurial** and **CVS**.
- **Continuous Integration**
 - Experience with CI through usage in open-source projects.
 - Familiarity with the set-up and usage of **Jenkins** and **Travis CI**.
- o Gained deeper insights into various fields pertaining to **Computer Science** and **Electrical Engineering**, of whose knowledge were previously vague and/or fragmented:
 - Use of **Matlab** to solve problems, analyze data, draw in 2D and 3D space, and perform simulations.
 - Knowledge of programming techniques, structures, algorithms and graph theory.
 - Furthered knowledge in the field of relational databases, including relational algebra, database normalization, and so on.
 - Intricate knowledge of the UNIX operating system, and general theories belonging to Operating Systems and computers in general.
 - Introduction to the world of **Logical** and **Functional programming**, beginning from the implementation of various algorithms in a recursive way, until the implementation of more complex applications with **GUI**.
 - **Analogue** and **Digital integrated circuits**, **Boole logic**, **Automata theory**, **finite-state automaton implementations** using analogue circuit elements, binary systems, decoders, (de-)multiplexers, mathematical operations, amplifiers, operational amplifiers, counters, mono-/bi-stables, registers, and memory types.

- **FPGA** programming, including implementation of state-machines using either or both **VHDL programming** and/or **schematic design** of circuit elements and gates.
- **Microcontrollers**, such as **PIC** and **Atmel** programmed in **ANSI C**. Intricate knowledge of the inner workings of a microprocessor thanks to **Microcontroller Design**, **Computer Architecture** and **Assembly Language** classes.
- Built a fully working **CPU** in **FPGA** from scratch for a class assignment.
- Gained deeper insight into the automation of SCADA systems and networking in cars, including the **CAN** protocol and the **CAPL** programming language in a special course taught by Continental AG.
- Learned the advanced parts of **Artificial Intelligence** via the related courses, which were then later put in practice via several extracurricular projects.
- Furthered knowledge in the field of networking by embarking on a journey to study the intricacies of various **networking protocols** as an extracurricular activity, by writing a WiFi packet capture software that also analyzes the received data.
- o Gave multiple presentations as an extracurricular activity on various emerging technologies.
- o When writing code, I focus on **simplicity**, **code-maintainability**, **optimization** and **security**.

Personal Skills

Communication skills gained through regular business and social interaction with clients and fellow developers. **Presentation skills** acquired by frequently giving presentations about various topics to varying audiences. **Organizational/Managerial skills** accumulated over time via superfluous scheduling and prioritizing to meet business and educational deadlines.

Interests

Self-teaching is an important part of my lifestyle. I try to keep up with the ever-evolving technologies of today. I constantly **try out new languages**, **new technologies** and **new practices**. I constantly go back and **re-do old projects**, with a twist, and I challenge myself to do it much better this time, by setting much higher goals. I read **research papers**, **0-day bulletins** and other sources of information that let me be ahead of the competition. I am not afraid to take initiative, and to color outside of the lines. I don't mind to get my hands dirty to try something out, let it be DoS-ing my own server in order to try out if an optimization technique or security practice did indeed work. I also watch **conference videos** (such as **DefCon**, **Black Hat**, etc) and **tech-talks** (such as **Microsoft's GoingNative**, and much more) in order to get an edge in their specific fields.

Notable Projects

RS TV Show Tracker.....

An **open-source** application which was born out of the need for the features it currently offers, as there were no alternative solutions for them at the time. To date, no software has so many features in this category, and as a result, under the four years it's been actively developed, its popularity has grown exponentially. Today, I single-handedly maintain it and push updates to hundreds of thousands of users on a monthly basis.

The application was developed in **C#** with an interface in **WPF**, and was kept constantly up-to-date with the newer technologies that have been released during its development phase.

There are, as of writing this in May 2015, **135,700 active daily users** of the application, with the number of installations reaching into the **millions**. Development started in **February 2010**.

Host Scanner.....

An **open-source** application developed as an implementation companion to my bachelor's thesis. The purpose of the application is to perform **autonomous vulnerability assessment** using both active and passive scanning, or by analyzing earlier reports of 3rd-party tools.

The features and implementation techniques are unique to this application, a fact which was validated by an **award-winning** presentation at the **XV. Scientific Students' Associations Conference**.

The application was developed in **C++** with strong **cross-platform** support with OS-specific implementations for *Linux*, *Windows* and *BSD/Darwin* systems. The various helper scripts that come bundled with the application were developed in **Go**.

AlienSubtitles.com.....

Full-stack development of the website and continued maintenance, including initial **devops responsibilities** (such as cloud server deployment on DigitalOcean) and continued **proactive monitoring** and administration of the web, database and load-balancer servers.

The website was developed in **PHP (HHVM)** backed by **MySQL** servers in **multi-master replication** configuration and **ElasticSearch** instances for the search feature.

At its peak, the site had **15 million unique users**, who were served by 4 geo-located and load-balanced front-end servers, attaining **100% uptime** and **under 10 millisecond response times** for all users throughout peak times. Development started in **December 2013**.