

# Resumé - Petr Máj

First name / Surname **Petr Máj**

Address

Phone

E-Mail

## Professional Interests

Professional Interests Design of dynamic languages and their virtual machines, compilers, static and dynamic optimizations, distributed languages and cloud execution, programming of embedded and real-time systems.

I also enjoy carpentry, especially designing and building wooden furniture.

## Work Experience

Position **Researcher in the field of virtual machines** (contractor)

Dates January 2013 – now

Main Responsibilities Main author of FlaiR – a static and dynamic analysis framework for the R language. One of the developers of the FastR VM and runtime for the R language. Responsible for the static and dynamic analysis of the R code and related optimizations. Implementer of TestR framework for R language test driven specification, testing and benchmarking R Vms. Design and implementation of continuous program analysis framework, optimizations and invalidation. Participation in research conferences. Mentoring junior researchers.

Employer **Purdue University, Northeastern University**, grant managed by Jan Vitek

Position **Embedded and real-time development** (contractor)

Dates February 2013 – May 2013

Main Responsibilities Design and implementation of embedded systems based on Intel 8051 and Atmel AVR technologies, correction of concurrency problems in existing solutions.

Employer **RexMedia, inc.**, Ke Mlynku 597, Praha Vinor, 190 17

Position **Senior Developer**

Dates April 2012 – December 2012

Main Responsibilities Working on the design & implementation of almost all parts of the distributed non SQL big data store and analytics framework including core messaging, user-level API, distributed execution, initial implementation of R-like distributed queries on the cloud system.

Employer **OxData, inc.**, 1185 Terra Bella Ave., Mountain View, CA 94040, USA (startup company co-founded by Cliff Click, advised by Doug Lea, and Kevin Normoyle)

Position **Compiler Engineer**

Dates November 2010 – April 2012

Main Responsibilities Responsible for correcting bugs & developing new features for the SN compiler that is used by most developers for Sony Playstation 3, PSP and PS Vita. Apart from the compiler, also responsible for implementing PS Vita assembler from scratch (main developer).

Employer **SN Systems Ltd**, Hartwell House, 55-61 Victoria Street, BS1-6AD, United Kingdom

Position **Developer - Internship**

Dates January 2009 – July 2009

Main Responsibilities Created a voice application framework and reference voice applications for the Embedded Conversational Solutions team. Led multiple usability tests of the voice interaction system.

Employer **IBM Czech Republic, Watson Research**, V Parku 2294/4, 14800 Prague, Czech Republic.

Position **Teaching Assistant**

Dates October 2008 – February 2009

Main Responsibilities A sole teacher of two groups (20 students each) of advanced students in their exercise classes from the compulsory Algorithmics course. These classes consisted of short presentations, explanations of the lectures and examples. Helped grading and examining the students.

Employer **Czech Technical University**, Department of Computer Science, Faculty of Electrical Engineering, Karlovo náměstí 13, 12135 Prague, Czech Republic.

Position **Teacher** – Preparatory Seminar for IT Universities, General IT course

Dates October 2007 – July 2009

Main Responsibilities Taught the preparatory seminar for prospective IT students (focus on C++ and algorithms) on one of the most prestigious grammar school in Prague, all students were accepted to the best Czech IT Universities. Also developed new advanced general IT course in Python that was extremely well received among both students and other educators and is still in use.

Employer **Archbishop Grammar School**, Korunní 2, 120 00 Prague, Czech Republic.

Position **Developer, student intern**

Dates January 2001 – April 2006, June 2008- December 2008, July 2009

Main Responsibilities Implemented the weather forecast webpage and other UI elements used by the forecast system. Over the years contributed in other ways to the forecasting system infrastructure and statistical engine.

Employer **Academy of Sciences of the Czech Republic**, Institute of Computer Science, Pod Vodárenskou Věží 2, 18207 Prague, Czech Republic.

Other Experiences Many charitable and community projects, teaching student activities, CodeWeek EU participation, development of a computer rehabilitation game for children suffering from the Down syndrome, and e-learning suite for socially impaired children.

## Education & Training

Title Expected **Doctor of Philosophy (PhD)**, canceled due to family emergency

Dates 2009 – 2010

Advisor professor Jan Vitek

Principal Subjects PhD qualifications from Languages, Operating Systems and Algorithms with highest marks.

University **Purdue University**, Department of Computer Science, College of Science, 305 N. University Street, West Lafayette IN 47907-2107

Title Awarded **Master of Engineering**, summa cum laude

Dates 2007 - 2009

Principal Subjects/ System Programming, Computer Science, Language Engineering

Skills Covered Thesis title: *Source Code Plagiarism Detection*

University **Czech Technical University**, Department of Computer Science, Faculty of Electrical Engineering, Karlovo náměstí 13, 12135 Prague, Czech Republic.

Type of Qualification **EU Erasmus studentship**, 1<sup>st</sup> class honors in major, upper 2<sup>nd</sup> class honors overall

Dates 2006 - 2007

Principal Subjects/ Various graduate level courses, notably Advanced Language Engineering, Quantum

Skills Covered Computation and Evolutionary Computing.

University **University of Bristol (UK)**, Faculty of Engineering, Queen's Building, University Walk, BS8 1TR, Bristol, United Kingdom

Title Awarded **Bachelor of Engineering**

Dates 2003 - 2007

Principal Subjects/ Computer Science and Electronics, Computer Architecture Design

Skills Covered Thesis title: *Context-free Grammar Parser Generator in C++*

University **Czech Technical University**, Department of Computer Science, Faculty of Electrical Engineering, Karlovo náměstí 13, 12135 Prague, Czech Republic.

## Notable Projects

APE An **ECMA-262 (Javascript) virtual machine**. Developed as part of Programming Languages course at Purdue in 2010. Winning application of the class with performance order of magnitude better than projects of other students.

Crosscheck (Master thesis, 2009) Application for **plagiarism detection** (code similarity measure). Instead of the attribute counting techniques commonly used I have employed principles known from compilers such as static analysis and abstract interpretation for better recognition of plagiarized submissions.

AGPG (Bachelor thesis, 2007) A **tool similar to ANTLR**, working directly with C++ and able to statically check & correct the actions associated with grammar rules (an attributed grammar parser generator).

Magicweb (2001, high school student) **HTML, CSS, PHP editor** with syntax checking and other features not common at the time of development . More than 10000 downloads.

## Published Papers

- VEE 2014 Kalibera T, Maj, P, Morandat, F, Vitek, J.: ***A fast abstract syntax tree interpreter for R.***
- Concurrency & Computation 2011 Kalibera, T, Hagelberg, J, Maj, P, Pizlo, F, Titzer, B. and Vitek, J., ***A family of real-time Java benchmarks.*** Concurrency and Computation: Practice and Experience, 23: n/a.  
Doi: 10.1002/cpe.1677
- PLDI 2010 Pizlo F, Ziarek L, Maj P, Hosking A, Vitek J, Blanton E.: ***Schism: Fragmentation-Tolerant Real-Time Garbage Collection***
- EUROSYS 2010 Pizlo F, Ziarek L, Blanton E, Maj P, Vitek J.: ***High-level Programming of Embedded Hard Real-Time Systems***

## Attended Conferences & Workshops

- 2015 **ECOOP**, Prague, Czech Republic, housing chair
- 2014 **PLDI**, Edinburgh, UK
- 2013 **UseR!**, Albacete, Spain  
**SPLASH**, Indianapolis, IN  
**Dynamic Languages for Scalable Data Analytics (DALI)**, by invitation, Indianapolis, IN
- 2010 **Virtual Execution Environments for Scientific Computing (VEESC)**, Washington, D.C  
**Java Technologies for Real-time and Embedded Systems (JTRES)**, Prague, Czech Republic  
**EuroSys**, Paris, France
- 2009 **OOPSLA**, Orlando, FL
- 2008 **International School on Trends in Concurrency (TIC)**, Prague, Czech Republic

## Awards

- 2015 **CodeWeek EU Google grant** recipient for embedded programming introduction to high school students.
- 2013 **Best technical presentation**, TestR poster at UseR! 2013, Albacete, Spain
- 2010 The **fastest Javascript VM implementation**, Purdue & Microsoft sponsored competition for PhD students
- 2009 Recipient of the **Ross Fellowship**, awarded by the Purdue University.
- 2009 Dean's Award for an **outstanding Master thesis**, awarded by the Czech Technical University.

## Computer Skills

- Languages C/C++/Java – expert level  
Python/JavaScript/R/various assembly languages – advanced level  
Smalltalk/LISP/PHP/Prolog/Delphi/C# - working level
- Platforms Windows/Linux/RTEMS/AVR/Windows Phone/QT
- Tools MSVS/Eclipse/Netbeans/Delphi/GNU tools  
Git/Mercurial/Perforce  
TeamCity/Jenkins

## Language Skills

- Mother Tongue Czech
- Other Languages English – fluent, near native - **IELTS overall band 8.5** (8, 8.5, 7.5, 9) (November 2008)