Martin Drozdík

Curriculum Vitae

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Key skills

Applied Mathematics Multi-objective optimization, evolutionary computation, computational geometry, algorithm design, graph algorithms, probability theory, statistics.

C++ **6 years** active experience. Deep interest in best practices and C++11/14. Experience with high-performance code and parallelization.

Qt **3 years** active experience, especially in **GUI** design and implementation.

IT skills

Operating systems	Linux / Windows
Programming	TCL/TK, Matlab/Octave, SQL, R, C
Tools	Mercurial/Git, Valgrind/Callgrind, Qmake
Web development	JavaScript, HTML, CSS, SSL/TSL, TCP, UDP

Languages

Fluent	Intermediate	Beginner	Native
English	Italian	French	Slovak
Japanese	German		Czech

Professional experience

2017

Software developer, *AskBe4*, Vienna, Austria, Backend development.

2016

Freelance programmer, *freelancer.com*, Vienna, Austria,
Development of a floating license system (C++14/Qt 5/SSL).
Single-handedly implemented a client-server system according to client's specification. Used technologies:

- C++14, Qt 5, clang, SSL/TLS, Botan
- Platform-independent Linux/Windows/OS X
- SHA-256, RSA, Certificate pinning, Digital signature

2016
2015

Software developer, OM Partners,
Antwerp, Belgium,
Developing and maintaining an advanced enterprise planning application. Key technologies: C++, Qt, SQL, Windows.
As a part of a 10 member team, using the *agile* methodology we maintained and developed in a shared code base of over 6 million lines of code.

2015
2011

Doctoral student, Tanaka-Hernan-Akimoto laboratory,
Shinshu University, Nagano, Japan,
Multi-objective optimization using evolutionary computation.

- Developed a method to keep track of non-dominated individuals (NDI) in the population of an evolutionary multi-objective optimizer after each change to the population. This method performs up to 400 fewer comparisons than the brute force method and works up to 4 times faster than the state-of-the art divide and conquer algorithm (which cannot keep track of NDI at all times).
- Studied:
  - self-adaptation and learning within multi-objective evolutionary algorithms
  - rotational invariance of multi-objective optimizers.
- Developed:
  - high-performance, multi-dimensional, geometric data structures (C++)
  - graphical application to analyze data from numerical experiments (Qt)
  - a library of multi-objective evolutionary algorithms (C++).
- Peer reviewed at top journals and conferences (EJOR, IEEE TEVC, GECCO).

2014
2013

Researcher, Dolphin team, Inria, Lille, France,
Exploration of differential evolution parameters (C++/Qt).

- Performed numeric experimentation using the Grid5000 cluster computer.
- Analyzed and interpreted tens of GB of data using a single laptop computer.

2011
2010

Programmer, Accenture Technology Solutions, Vienna, Austria.
Administered IBM mainframe jobs (JCL, ISPF, DB2, PL/I) and wrote technical documentation.

2008

Freelance programmer, Ministry of environment of Slovakia, Bratislava, Slovakia,
Digital archive of news articles.

- Implemented a data entry tool for teammates who classified the articles.
- Designed and implemented an application to browse >2000 pdf files (C++).

2010
2007

Freelance math tutor.
Teaching linear algebra and mathematical analysis, mostly in one on one lessons.

2007

Volunteer, *Initiative to preserve environment in Bratislava old town*.
Helped save the park on Belopotockeho street from being replaced by an apartment building by collecting over 1000 valid petition signatures and participating in legal battles (park.estranky.sk).

Awards and scholarships

2014
2010

Monbukagakusho, *Scholarship of the Japanese Ministry of Education*, Awarded to two research students from Slovakia annually. Selection based on research plan quality and recommendation from a prospective supervisor from the Japanese side.

2013

IEEE Young Researcher Presentation Award, *IEEE Session*, Niigata.

2008

Erasmus, *Full scholarship and tuition for 5 months (University of Pisa)*.

2008
2005

Dean's motivational scholarship, *top 10% of class*, awarded 4 times.

Books that influenced me professionally

Robert C. Martin — **Clean Code**

Scott Meyers — **Effective C++, Effective Modern C++**

Thomas H. Cormen et al. — **Introduction to Algorithms**

Formal education

2015
2011

Doctorate, Engineering (Computer Science),
Department of Mathematics and System Development, Shinshu University, Nagano, Japan.
Title of thesis : Improvements in Understanding and Performance of Multi-objective Differential Evolution

2010
2008

Master, Applied Mathematics,
Comenius University in Bratislava, Slovakia,
Graduated with honors.
Title of thesis : Stochastic Processes in State Space Form and ML Estimation of Their Parameters

2009
2008

Erasmus exchange student, Mathematics and Economics,
University of Pisa, Italy.

2008
2005

Bachelor, Applied Mathematics,
Comenius University in Bratislava, Slovakia,
Graduated with honors.
Title of thesis : Strange Functions in Mathematical Analysis

Major publications

2015 M. Drozdik, H. Aguirre, Y. Akimoto, and K. Tanaka
Comparison of Parameter Control Mechanisms in Multi-objective Differential Evolution
Presented at the *Learning and Intelligent Optimization (LION9)* conference, published in *Lecture Notes in Computer Science, volume 8994.*

2014 M. Drozdik, H. Aguirre, Y. Akimoto, and K. Tanaka
Computational Cost Reduction of Non-dominated Sorting Using M-front
In *IEEE Transactions on Evolutionary Computation.*

2014 M. Drozdik, K. Tanaka, H. Aguirre, S. Verel, A. Liefooghe, and B. Derbel
An Analysis of Differential Evolution Parameters on Rotated Bi-objective Optimization Functions
Presented at the *Simulated Evolution and Learning (SEAL2014)* conference, published in *Lecture Notes in Computer Science, volume 8886.*

2013 M. Drozdik, H. Aguirre, and K. Tanaka
Attempt to Reduce the Computational Complexity in Multi-objective Differential Evolution Algorithms
Presented at the *GECCO 2013 conference*, published in *Proceedings of the 15th Annual Conference on Genetic and Evolutionary Computation.*