

# Martin Drozdík

## Curriculum Vitae

Mariannengasse 21

Vienna, 1090

Austria

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www.martindrozdik.com



### 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 / UBUNTU / BASH
- Office MERCURIAL, LIBREOFFICE, LATEX, INKSCAPE
- Programming VALGRIND, QMAKE, MATLAB/OCTAVE, SQL, R, EIGEN
- Web development JAVASCRIPT, HTML, CSS

### Languages

- | Fluent     | Intermediate | Beginner | Native   |
|------------|--------------|----------|----------|
| ○ English  | ○ Italian    | ○ French | ○ Slovak |
| ○ Japanese | ○ German     |          | ○ Czech  |

### Professional experience

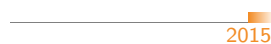
- 2015 **Software developer**, OM PARTNERS,  
Antwerp, Belgium,  
Developing and maintaining an advanced enterprise planning application.  
Key technologies: C++, QT, SQL, WINDOWS.  
As a part of a 10 member team, using the *agile* methodology we maintain and develop a shared code base of over 6 million lines of code.



**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).



**Open source project contributor**, EIGEN: C++ *linear algebra library*. Recently my first bug-fix was merged.



**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.



**Programmer**, ACCENTURE TECHNOLOGY SOLUTIONS, Vienna, Austria.

Administered IBM mainframe jobs (JCL, ISPF, DB2, PL/I) and wrote technical documentation.



**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++).



**Freelance math tutor**.

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



**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



**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.



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



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



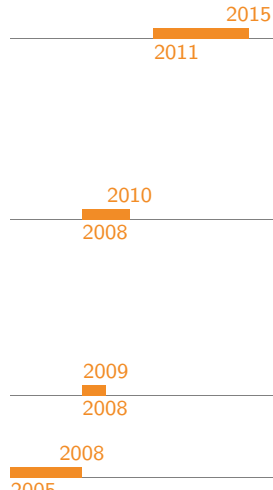
**Dean's motivational scholarship**, *top 10% of class*, awarded 4 times.



## Books that influenced me professionally

Robert C. Martin **Clean Code**  
Scott Meyers **Effective C++, Effective Modern C++**  
Herb Sutter **Exceptional C++ Style**

## 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, To appear 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*.

