

Mirko Maischberger, Ph.D. Eng.

CONTACT INFORMATION Global Optimization Laboratory office: +39 055 4796 464
Dipartimento di Sistemi e Informatica mobile: (not disclosed)
Università degli Studi di Firenze e-mail: mirko.maischberger@gmail.com
Via S. Marta, 3
50139 Firenze (Italy)

SPECIALISATION Operations Research · Metaheuristics · Software Development · Open Source Software

EDUCATION **Ph.D. in Operations Research**, Università degli Studi di Firenze **March 2011**

- Advisors: Professor Fabio Schoen
- Visiting PhD Student at CIRRELT, Université de Montréal, under the supervision of Prof. Jean-François Cordeau, February–July 2010
- PhD Schools attended:
 - *Convex Optimization* Prof. S. Boyd, Università di Siena, March 21–24, 2011
 - *Spring School on Combinatorial Optimization in Logistics* Université de Montréal, May 17–20, 2010
 - *Mathematical Foundations of Complex Networked Information Systems*, CIME, June 22–26, 2010
 - *Column Generation* Prof. M.V. de Carvalho, Università di Pisa, April 20–24, 2009
 - *New Algorithmic Paradigms in Optimization* ETH Zurich, June 16–20, 2008
 - *Integer Programming and Network Optimization* Prof. J.J. Salazar-Gonzalez, Politecnico di Milano, March 2008
 - *Projection, Lifting and Extended Formulation* Prof. E. Balas, Scuola Superiore Santa Chiara, Università di Siena

M.Sc. in Engineering, Università degli Studi di Firenze **December 2006**

PUBLICATIONS **Journal Articles**

Cordeau, J.-F. and Maischberger, M., “A Parallel Iterated Tabu Search Heuristic for Vehicle Routing Problems”, *to appear*

Invited Talks

Maischberger, M., “METSlib: A Metaheuristics Framework in Modern C++”, *INFORMS 2010 Annual Meeting*, Austin, TX

Conference Proceedings

Maischberger, M. and Cordeau, J.-F., “Solving Variants of the Vehicle Routing Problem with a Simple Parallel Iterated Tabu Search”, *INOC 2011*, Hamburg, Germany

Maischberger, M., “Optimising node coordinates for the shortest path problem” in S. Caferi, A. Mucherino, G. Nannicini, F. Tarissan, L. Liberti (Eds.), *CTW09 Proceedings*, École Polytechnique and CNAM, 93–96, 2009.

Book Chapters

Cappanera, P. and Cotroneo, F. and Lori, A. and Maischberger, M. and Schoen, F., “Ottimizzazione di percorsi su reti multimodali di trasporto pubblico” In Giovanni Felici and Anna Sciomachen, editors, *Scienza delle decisioni in Italia: applicazioni della ricerca operativa a problemi aziendali*, pages 401–414. ECIG Edizioni Culturali Internazionali Genova, Genova, September 2008

Maischberger, M. and Rinaldi, R. and Schoen, F., “Ottimizzazione logistica in Guess? Inc”. In Giovanni Felici and Anna Sciomachen, editors, *Scienza delle decisioni in Italia: applicazioni della ricerca operativa a problemi aziendali*, pages 283–292. ECIG Edizioni Culturali Internazionali Genova, Genova, September 2008.

COIN-OR,

Foundation Full Member

August 2010–present

Full-member of the COIN-OR foundation.

COIN-OR,

Project Manager

April 2009–present

Project Manager of the METSlib project, a metaheuristics framework in C++.

EXPERIENCE

CIRRELT, Université de Montreal, QC

Visiting PhD student

February–July 2010

Studied and implemented a parallel iterated tabu search metaheuristic for some vehicle routing problems under the supervision of Prof. J-F. Cordeau. The algorithm was implemented in C++ (~4000 sloc) using MPI and the METSlib library available on COIN-OR. A scientific paper on the results is being worked on. The algorithm scaled efficiently from 1 to 64 processors.

Università di Firenze,

Research Project

March–December 2009

Developed and compared different algorithms and speed-up techniques for the solution of the bi-criteria shortest path problem. The algorithms can be applied in many shortest path decision problems: we used it to find all the shortest and safest paths between two places from the point of view of a bicyclist. We experimented different algorithmic variants and a speed-up technique based on preprocessing. The algorithm was implemented in C++ in many variants for a total of about 3000 sloc. A costly preprocessing algorithm was parallelized using MPI. Even if the problem is NP-Hard we obtained a good on-line query time for graphs with up to 50.000 nodes.

CSIAF, Via delle Gore 2, Firenze

Technical Teaching

May 2009

24 hours teaching XML, DTDs, XML Schemas, XSLT and JAXP.

Università di Firenze,

Contract Professor

January–March 2009

20 hours, Contract Assistant Professor of “Optimization methods” (MAT/09).

Comune di Firenze,

Open Source Consultant

September 2007–December 2008

A study on Open Source migration. Given some difficulties in obtaining current data we launched a survey amongst all the employee (a few thousand) to spot the difficulties in the transition: the applications used, the usage of VBA, the knowledge about free-software, the willingness to address such a change and some other factors. We received a 60% of accurately compiled surveys. The biggest problem we found to be solved before any migration is possible was that most of their internal procedures (especially the most used and recently developed) depend on MS Word. Nonetheless we concluded that, given the available data, a migration could be tried for 1/3 of the employees since they have few or no need to exchange informations with others or with the system.

CSIAF, Via delle Gore 2, Firenze

Technical Teaching

October 2008

28 hours teaching a basic course on PHP/MySQL.

Università di Firenze,

Contract Professor

October 2007–April 2008

20 hours, Contract Assistant Professor of “Operations Management Models and Algorithms” (MAT/09)

Grok42 snc/Arti Elettroniche srl, Montevarchi

Software Engineer

2000–2008

Lead developer of a small team in the development of a web Java software (~21.000 lines of code and ~1000 of XSLT) using XML and Struts. The software has a simple frontend to let the user free to explore funding opportunities and a programmable backend that makes easy adding new European regulations.

The “Carta delle Opportunità” software won some prestigious prizes:

- "Premio Qualità", COM-PA, Bologna, 2000 edition.
- "Premio Regionando", FORUM.P.A., Rome, 2001 edition.

Engineering Ingegneria Informatica SpA, Firenze

C++ Software Engineer

May–December 2007

Lead developer in the implementation of the previously studied algorithms for the computation of shortest paths on multimodal graphs (walk, public transport, trains). Development of a web-service API using XML-RPC. ~10000 loc in C++.

Università di Firenze,

Research Fellow

June–September 2007

Studied the problem of finding optimal paths on multimodal graphs. The main focus was on speed-up techniques and on shortest paths with side constraints. Using an expensive pre-processing technique we managed to speed-up by a factor 10 the on-line query time.

Università di Firenze,

Research Fellow

February–April 2007

Involved in the project: “Logistic Optimization in Guess Italia”. The project increased the number of fulfilled orders up to 30%. My role was to test different mathematical models, to choose the best solver software for the job, and to develop a prototype in C++. The solution we developed for Guess Italia was later integrated in their information system by Guess Europe.

Truelite srl, Firenze

Technical Teaching

February 2007

20 hours teaching Java JDBC and XML at ITTIG CNR in Florence.

ELEA SpA, Firenze

Technical Teaching

January 2007

48 hours teaching PHP5 & MySQL (financed course).

Truelite srl, Firenze

Technical Teaching

October 2006

30 hours teaching Java at ITTIG CNR in Florence.

ELEA SpA, Firenze

Technical Teaching

September 2006

14 hours teaching Advanced HTML.

ELEA SpA, Firenze

Technical Teaching

June 2006

21 hours teaching Unix System Administration.

ELEA SpA, Firenze

Technical Teaching

October 2005

40 hours teaching “Gentoo Linux” to 12 employees of OTE SpA (financed course).

Arti Elettroniche srl, Montevarchi

Webmaster

September–December 2005

Webmaster of the Tuscany.PodTravels.TV Video Podcast. Featured on Wired News, United Press International, The Indianapolis Star and Yahoo Podcast Product News.

Arti Elettroniche srl, Montevarchi

Software Engineer

2001

Lead developer of the Madras web content management system used until 2008 by ecquologia.it.

Arti Elettroniche srl, Montevarchi

Developer **1998–2000**
Development of the “Carta delle Opportunità” software in VB/ASP.

NebTech srl, Firenze

Developer **1995–1998**
Development of many industrial applications in C and Visual Basic.

ORGANISATIONAL
SKILLS

Project manager and lead developer of software projects (analysis, budget, time and resource management, development). Committee member for a few successful degree thesis in Operations Research.

TECHNICAL
SKILLS

C++, XML, XSL, XSD, Python, Ruby, C, Java, JSP/Servlets, Struts, MySQL, HTML/CSS, Linux shell scripting.