Dario Di Nucci

Name: Dario Di Nucci	**Address:** Pleinlaan 2, B-1050 Brussels, Belgium
Date of Birth: 3rd September, 1988	**Phone:** +39 333 340 3254
Place of Birth: Isernia, Italy	**E-mail:** ddinucci@vub.ac.be
	Website: http://dardin88.github.io

Skills

Operating Systems	Linux, Windows, macOS
Programming Languages	C, Java, JavaScript, Matlab, R, Python
Web-oriented Languages	HTML, CSS, PHP
Database Languages	SQL, PostgreSQL
Control version systems	Git, Subversion
bug tracking systems	Bugzilla, JIRA
Others	LaTeX, UML, Data Mining, Data Warehousing, Information Retrieval

Language Skills

Italian	Mother tongue
English	B2

Software Projects

2017

aDoctor
https://github.com/fpalomba/aDoctor
aDoctor is a tool able to identify 15 Android-specific code smells from the catalogue by Reimann et al.

PETrA
http://tinyurl.com/je2nxkd
PETrA is a software able to estimate the energy consumption of method calls in Android apps. It is based on some Android tools that are Monkey, Batterystats, Systrace, and dmtracedump.

2015

Landfill
http://www.sesa.unisa.it/landfill
Landfill is a Web-based platform for sharing code smell datasets. It also provides a set of APIs for programmatically accessing its data. Anyone can contribute by: improving existing datasets or sharing and posting new datasets.

2014

Gnome maps
https://wiki.gnome.org/Apps/Maps

Gnome Maps is a map application for GNOME.

GraphHopper
https://graphhopper.com
GraphHopper offers memory efficient algorithms in Java for routing on graphs. E.g. Dijkstra and A* but also optimized road routing algorithms like Contraction Hierarchies. It stands under the Apache License and is build on a large test suite.

Work Experience

01/2018 – Actual — **Research Fellow**
Vrije Universiteit Brussel
INTelligent Modernisation Assistance for Legacy Software project

04/2014 – 09/2014 — **Software Developer**
Gnome and GraphHopper
Google Summer of Code 2014 working on Gnome Maps and GraphHopper.

09/2011 – 01/2012 — **Software Developer**
CercAziende.it, Venafro, Italy
Development of a search engine for indexing and searching data on a MySQL database.

11/2005 – 12/2005 — **Customer Service Representative / Technical Support**
eliquidMEDIA International Inc., Windsor, ON, Canada
Web development and customer relationship handling.

Education

2017/06 — **International Summer School on Software Engineering (ISSSE)**
University of Salerno, Fisciano, Italy

2017/03 – 2017/05 — **Visiting Student**
Delft University of Technology, The Netherlands
Supervision: Prof. Andy Zaidman

2016/05 – 2016/07 — **Visiting Student**
Delft University of Technology, The Netherlands
Supervision: Prof. Andy Zaidman

2016/06 — **International Summer School on Software Engineering (ISSSE)**
University of Salerno, Fisciano, Italy

2015/09 — **International Summer School on Software Engineering (SE School@unibz)**
Free University of Bolzano, Bolzano, Italy

2014/12 – Actual — **Doctor of Philosophy (Ph.D.) Program in Management & Information Technology**
University of Salerno, Italy
Fully funded by University of Salerno. Advisor: Prof. Andrea De Lucia

2013/03 — **Erasmus IP Human-Machine Interaction**
Reims, France

2011/10 – 2014/09	**Master's Degree (M.Sc.) in Computer Science** University of Salerno, Italy 110/110 cum laude
2007/10 – 2011/05	**Bachelor's Degree (B.Sc.) in Computer Science** University of Molise, Italy 110/110 cum laude

Certifications

2014	**Professional practice examination for the engineering license**

Research Interests

My research activities are mainly focused on maintenance and testing of software systems. In details my research interest are:

- **Bug Prediction.** Allocating resources for the testing and the verification of all the parts of a large software system is a cost-prohibitive task. To alleviate this issue, prediction models able to identify portions of source code more prone to contain bugs have been the object of several studies. The main research topic is the definition of accurate prediction models that, on the one hand use a suitable set of predictors able to characterize the bug-proneness of code components, and on the other hand are able to use appropriate machine learning techniques to distinguish those components affected by bug.
- **Search Based Software Testing.** Software testing is an essential yet expensive activity in software development, therefore much research effort has been put to automate it as much as possible. Search-based software testing consists of using meta-heuristic optimizing search technique, such as genetic algorithms, to address problems in the software testing and verification and validation domain, such as regression testing optimization and automatic test data generation. The main goal of an optimization process is to guide the search toward good solutions from a potentially infinite search space, within a practical time limit.
- **Energy Optimization of Mobile Apps.** Energy efficiency is a vital characteristic of any mobile app, and indeed is becoming an important factor for user satisfaction. However, optimizing the energy consumption of a mobile app is non-trivial due to the highly volatile nature of mobile execution environments and the lack of knowledge of software developers. The goal of this topic is on the one hand to build new tools able to measure the energy profile of mobile apps, and on the other hand to propose new methods and tools able to assist software developers.
- **Mining Software Repositories.** Software repositories such as source code control systems, communications stored between project staff and monitoring systems of the defects are used to improve the management of the progress of software projects. The purpose of this branch of research is to find out how to obtain information in order to help understand the development and evolution software processes, support forecasts on software development, and plan future developments.
- **Empirical Software Engineering.** Empirical software engineering is a subdomain of software related to experiments on systems software (software products, processes and resources). This branch includes the design of experiments on software, the collection of the results, and the consequent development of laws and theories.

Teaching

Teaching Assistance

2016/17
2015/16
Software Engineering, Management and Evolution
Master's Degree in Computer Science, University of Salerno, Italy

2015/16
Software Engineering: Maintenance and Testing
Master's Degree in Computer Science, University of Salerno, Italy

2016/17
2015/16
Programming I
Bachelor's Degree in Computer Science, University of Salerno, Italy

2016/17
2015/16
Software Engineering
Bachelor's Degree in Computer Science, University of Salerno, Italy

2016/17
Web Development
Bachelor's Degree in Computer Science, University of Salerno, Italy

Theses Coordination Support

2017

Design and development of methods for test case minimization
Student: Francesco De Feo – B.Sc. in Computer Science – Advisor: Prof. Andrea De Lucia

Design and development of methods for test case prioritization
Student: Giuseppe Sessa – B.Sc. in Computer Science – Advisor: Prof. Andrea De Lucia

Design and development of a plugin for optimizing regression testing
Student: Gerardo Della Monica – B.Sc. in Computer Science – Advisor: Prof. Andrea De Lucia

Design and development of a plugin for the detection of energy defects of mobile applications
Student: Sara Zaino – B.Sc. in Computer Science – Advisor: Prof. Andrea De Lucia

Design and development of a defect prediction tool
Student: Giuseppina Tufano – B.Sc. in Computer Science – Advisor: Prof. Andrea De Lucia

Development of a software energy estimation methodology in an integrated development environment
Student: Roberto Contaldo – B.Sc. in Computer Science – Advisor: Prof. Andrea De Lucia

Design and development of a defect prediction tool by using cross-project techniques
Student: Pasquale Martiniello – B.Sc. in Computer Science – Advisor: Prof. Andrea De Lucia

2016

TRIO: a Tool for Regression testIng Optimization
Student: Antonio Luca D'Avanzo – B.Sc. in Computer Science – Advisor: Prof. Andrea De Lucia

CheckApp: a tool for monitoring Java application performance
Student: Elisa D'Eugenio – M.Sc. in Computer Science – Advisor: Prof. Andrea De Lucia

Design and development of a defect prediction tool

Student: Fabiano Pecorelli – B.Sc. in Computer Science – Advisor: Prof. Andrea De Lucia

PETrA: a Power Estimation Tool for Android applications
Student: Antonio Prota – M.Sc. in Computer Science – Advisor: Prof. Andrea De Lucia

2015

Development and comparison of novel techniques for search based test data generation
Student: Giovanni Grano – M.Sc. in Computer Science – Advisor: Prof. Andrea De Lucia

Design and development of a tool for the automatic generation of test cases
Student: Simone Scalabrino – M.Sc. in Computer Science – Advisor: Prof. Andrea De Lucia

A combined model for the prediction of defects
Student: Giuseppe De Rosa – M.Sc. in Computer Science – Advisor: Prof. Andrea De Lucia

Professional Activities

Organization Committee Participation

2017

Scientific Secretariat
13th International Summer School on Software Engineering, University of Salerno, Italy

2016

Scientific Secretariat
12th International Summer School on Software Engineering, University of Salerno, Italy

Program Committee Member

2018

International Conference on Software Maintainance and Evolution (ICSME) - Tool Demo Track

International Conference on Advances in System Testing and Validation Lifecycle (VALID)

Workshop on Machine Learning Techniques for Software Quality Evaluation (MaLTeSQuE)

2017

International Conference on Advances in System Testing and Validation Lifecycle (VALID)

Reviewer

International Journals

Advances in Software Engineering - Elsevier
Arabian Journal for Science and Engineering - Springer
Empirical Software Engineering - Springer
IEEE Access - IEEE
Information Processing Letters - Elsevier
Journal of King Saud University, Computer and Information Sciences - Elsevier
Journal of Software: Evolution and Process - Wiley
Software Quality Journal - Springer

International Conferences

IEEE International Conference on Software Analysis, Evolution, and Reengineering: 2017, 2018
IEEE International Conference on Program Comprehension: 2016
IEEE International Conference on Software Maintenance and Evolution: 2016 (ERA Track)
International Conference on Business Information Systems: 2015, 2016
International Conference on Distributed Multimedia Systems: 2015, 2016

International Conference on Enterprise Information Systems: 2015, 2016, 2017

Invited Talks

2017

Defect Prediction: using Machine Learning for focusing the Testing Effort
Jheronimus Academy of Data Science, 's-Hertogenbosch, The Netherlands, December 5th 2017

Diagnose and Detect Energy Flaws of Android Apps
Vrije Universiteit Brussel, Brussels, Belgium. March 23rd 2017

Participations at Conferences

2017

Codemotion
Amsterdam, The Netherlands

24th IEEE International Conference on Software Analysis, Evolution, and Reengineering (SANER)
Klagenfurt, Austria

2016

Symposium on Search-Based Software Engineering (SSBSE)
Raleigh, NC, United States

2015

Symposium on Search-Based Software Engineering (SSBSE)
Bergamo, Italy

37th ACM/IEEE International Conference on Software Engineering (ICSE)
Florence, Italy

12th IEEE/ACM Working Conference on Mining Software Repositories (MSR)
Florence, Italy

2014

The Gnome Conference (Guadec)
Strasbourg, France

Awards and Recognitions

2017

NSF Travel Support
Symposium on Search-Based Software Engineering (SSBSE), Raleigh, NC, United States

2015

ACM SIGSOFT Student Travel Grant
37th ACM/IEEE International Conference on Software Engineering (ICSE), Florence, Italy

PUBLICATIONS

INTERNATIONAL CONFERENCES

[C10] D. Di Nucci, F. Palomba, D. A. Tamburri, A. Serebrenik, A. De Lucia
Detecting Code Smells using Machine Learning Techniques: Are We There Yet?
In Proceedings of the 25th IEEE International Conference on Software Analysis, Evolution, and Reengineering (SANER 2018) – Campobasso, Italy, 2018, 10 pages, to appear.

[C9] D. Di Nucci, A. De Lucia
The Role of Meta-Learners in the Adaptive Selection of Classifiers
In Proceeding of Workshop on Machine Learning Techniques for Software Quality Evaluation (MaLTeSQuE) - Campobasso, Italy, 2018, 6 pages, to appear.

[C8] D. Di Nucci, F. Palomba, A. Prota, A. Panichella, A. Zaidman, A. De Lucia.
PETrA: a Software-Based Tool for Estimating the Energy Profile of Android Applications
In Proceedings of the 39th International Conference on Software Engineering (ICSE 2017) - Demonstrations Track, Buenos Aires, Argentina, 2017, 4 pages, 3-6.

[C7] F. Palomba, D. Di Nucci, A. Panichella, A. Zaidman, A. De Lucia.
Lightweight Detection of Android-specific Code Smells: the aDoctor Project.
In Proceedings of the 24th IEEE International Conference on Software Analysis, Evolution, and Reengineering (SANER 2017) - Tool Track, Klagenfurt, Austria, 2017, 5 pages, 487-491

[C6] D. Di Nucci, F. Palomba, A. Prota, A. Panichella, A. Zaidman, A. De Lucia.
Software-Based Energy Profiling of Android Apps: Simple, Efficient and Reliable?
In Proceedings of the 24th IEEE International Conference on Software Analysis, Evolution, and Reengineering (SANER 2017) - Klagenfurt, Austria, 2017, 12 pages, 103-114

[C5] S. Scalabrino, G. Grano, D. Di Nucci, R. Oliveto, A. De Lucia
Search-based Testing of Procedural Programs: Iterative Single-Target or Multi-Target Approach?
In Proceedings of the Symposium on Search-Based Software Engineering (SSBSE 2016) - Raleigh, NC, United States, 2016, 15 pages, 64 - 79

[C4] F. Palomba, D. Di Nucci, A. Panichella, R. Oliveto, A. De Lucia
On the Diffusion of Test Smells in Automatically Generated Test Code: An Empirical Study.
In Proceedings of the 9th International Workshop on Search-Based Software Testing (SBST 2016) - Austin, TX, United States, 2016, 10 pages, 5-14

[C3] D. Di Nucci, F. Palomba, S. Siravo, G. Bavota, R. Oliveto, A. De Lucia
On the Role of Developer's Scattered Changes in Bug Prediction.
In Proceedings of the 31st International Conference on Software Maintenance and Evolution (ICSME 2015) - Bremen, Germany, 2015, 10 pages, 241-250

[C2] F. Palomba, D. Di Nucci, M. Tufano, G. Bavota, R. Oliveto, D. Poshyvanyk, A. De Lucia
Landfill: an Open Dataset of Code Smells with Public Evaluation.
In Proceedings of the IEEE/ACM 12th Working Conference on Mining Software Repositories (MSR 2015) - Florence, Italy, 2015, 4 pages, 482-485

[C1] D. Di Nucci, A. Panichella, A. Zaidman, A. De Lucia
Hypervolume-based Search for Test Case Prioritization.
In Proceedings of the Symposium on Search-Based Software Engineering (SSBSE 2015) - Bergamo, Italy, 2015, 15 pages, 157-172

INTERNATIONAL JOURNALS

[J2] D. Di Nucci, F. Palomba, R. Oliveto, A. De Lucia.
Dynamic Selection of Classifiers in Bug Prediction: an Adaptive Method.
IEEE Transactions on Emerging Topics in Computational Intelligence (TETCI), 2017, Volume 1 Issue 3, 11 pages, 202-212.

[J1] D. Di Nucci, F. Palomba, G. De Rosa, G. Bavota, R. Oliveto, A. De Lucia.
A Developer Centered Bug Prediction Model.
IEEE Transactions on Software Engineering (TSE), 2017, Volume 44 Issue 1, 21 pages, 5-24.

22nd February 2018