



# Dario Di Nucci

**NAME:** Dario Di Nucci

**DATE OF BIRTH:** 3<sup>rd</sup> September, 1988

**PLACE OF BIRTH:** Isernia, Italy

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## EDUCATION

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- 2014/12 – 2018/03**      **DOCTOR OF PHILOSOPHY (PH.D.) IN MANAGEMENT & INFORMATION TECHNOLOGY**  
University of Salerno, Italy  
Fully funded by University of Salerno. Advisor: Prof. Andrea De Lucia
- 2017/06**                **13<sup>TH</sup> 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**                **12<sup>TH</sup> INTERNATIONAL SUMMER SCHOOL ON SOFTWARE ENGINEERING (ISSSE)**  
University of Salerno, Fisciano, Italy
- 2015/09**                **INTERNATIONAL SUMMER SCHOOL ON SOFTWARE ENGINEERING (SE SCHOOL@UNIBZ 2015)**  
Free University of Bolzano, Bolzano, Italy
- 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

## WORK EXPERIENCE

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- 01/2018 – ACTUAL**    **RESEARCH FELLOW**  
Vrije Universiteit Brussel  
INTElligent Modernisation Assistance for Legacy Software project
- 2014/12 – 2018/03**    **PH.D. STUDENT IN MANAGEMENT & INFORMATION TECHNOLOGY**  
University of Salerno, Italy  
Fully funded by University of Salerno. Advisor: Prof. Andrea De Lucia

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| <b>04/2014 – 09/2014</b> | <b>SOFTWARE DEVELOPER</b><br>Gnome and GraphHopper<br>Google Summer of Code 2014 working on Gnome Maps and GraphHopper   |
| <b>09/2011 – 01/2012</b> | <b>SOFTWARE DEVELOPER</b><br>CercAziende.it, Venafro, Italy<br>Development of a search engine for indexing and searching data on MySQL databases                         |
| <b>11/2005 – 12/2005</b> | <b>CUSTOMER SERVICE REPRESENTATIVE / TECHNICAL SUPPORT</b><br>eliquidMEDIA International Inc., Windsor, ON, Canada<br>Web development and customer relationship handling |

## RESEARCH INTERESTS

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

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### LECTURER

**2018/19**                    **CAPITA SELECTA OF SOFTWARE ENGINEERING**  
Master's Degree in Computer Science, Vrije Universiteit Brussels, Belgium  
*in collaboration with Prof. Coen De Roover*

### TEACHING ASSISTANT

**2016/17**                    **SOFTWARE ENGINEERING, MANAGEMENT AND EVOLUTION**  
Master's Degree in Computer Science, University of Salerno, Italy

**PROGRAMMING I**  
Bachelor's Degree in Computer Science, University of Salerno, Italy

**SOFTWARE ENGINEERING**  
Bachelor's Degree in Computer Science, University of Salerno, Italy

**WEB DEVELOPMENT**  
Bachelor's Degree in Computer Science, University of Salerno, Italy

**2015/16**                    **SOFTWARE ENGINEERING, MANAGEMENT AND EVOLUTION**  
Master's Degree in Computer Science, University of Salerno, Italy

**SOFTWARE ENGINEERING: MAINTENANCE AND TESTING**  
Master's Degree in Computer Science, University of Salerno, Italy

**PROGRAMMING I**  
Bachelor's Degree in Computer Science, University of Salerno, Italy

**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

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### 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

**2019**

5<sup>th</sup> International Conference on Advances and Trends in Software Engineering (SOFTENG)

**2018**

1<sup>st</sup> International Workshop on Cloud-Native Applications Design and Experience (CNAX)

34<sup>th</sup> IEEE International Conference on Software Maintenance and Evolution (ICSME) - Tool Demo Track

5<sup>th</sup> IEEE/ACM International Conference on Mobile Software Engineering and Systems (MOBILESoft) – Student Research Competition

10<sup>th</sup> International Conference on Advances in System Testing and Validation Lifecycle (VALID)

2<sup>nd</sup> Workshop on Machine Learning Techniques for Software Quality Evaluation (MaLTeSQuE)

**2017**

9<sup>th</sup> 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  
Computational Intelligence - Wiley  
Empirical Software Engineering - Springer  
IEEE Access – IEEE  
IET Software - Institution of Engineering and Technology  
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), 2018  
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

2018

**DEFECT PREDICTION: USING MACHINE LEARNING FOR FOCUSING THE TESTING EFFORT**  
Jheronimus Academy of Data Science, 's-Hertogenbosch, The Netherlands, March 9<sup>th</sup> 2018

2017

**DEFECT PREDICTION: USING MACHINE LEARNING FOR FOCUSING THE TESTING EFFORT**  
Jheronimus Academy of Data Science, 's-Hertogenbosch, The Netherlands, December 5<sup>th</sup> 2017

**DIAGNOSE AND DETECT ENERGY FLAWS OF ANDROID APPS**  
Vrije Universiteit Brussel, Brussels, Belgium. March 23<sup>rd</sup> 2017

## PARTICIPATIONS AT CONFERENCES

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2018

**40<sup>TH</sup> ACM/IEEE INTERNATIONAL CONFERENCE ON SOFTWARE ENGINEERING (ICSE)**  
Gothenburg, Sweden

**15<sup>TH</sup> IEEE/ACM WORKING CONFERENCE ON MINING SOFTWARE REPOSITORIES (MSR)**  
Gothenburg, Sweden

**25<sup>TH</sup> IEEE INTERNATIONAL CONFERENCE ON SOFTWARE ANALYSIS, EVOLUTION, AND REENGINEERING (SANER)**  
Campobasso, Italy

2017

**CODEMOTION**  
Amsterdam, The Netherlands

**24<sup>TH</sup> 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

**37<sup>TH</sup> ACM/IEEE INTERNATIONAL CONFERENCE ON SOFTWARE ENGINEERING (ICSE)**  
Florence, Italy

**12<sup>TH</sup> IEEE/ACM WORKING CONFERENCE ON MINING SOFTWARE REPOSITORIES (MSR)**  
Florence, Italy

**2014**                      **THE GNOME CONFERENCE (GUADEC)**  
Strasbourg, France

## **AWARDS AND RECOGNITIONS**

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**2017**                      **NSF TRAVEL SUPPORT**  
Symposium on Search-Based Software Engineering (SSBSE), Raleigh, NC, United States

**2015**                      **ACM SIGSOFT STUDENT TRAVEL GRANT**  
37<sup>th</sup> ACM/IEEE International Conference on Software Engineering (ICSE), Florence, Italy

# PUBLICATIONS

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## INTERNATIONAL CONFERENCES OR WORKSHOPS

[C16] S. Scalabrino, G. Grano, D. Di Nucci, M. Guerra, A. De Lucia, H. Gall, R. Oliveto  
OCELOT: a Search-Based Test-Data Generation Tool for C  
In Proceeding of the 33<sup>rd</sup> IEEE/ACM International Conference on Automated Software Engineering (ASE) - Tool Demonstrations Track, Montpellier, France, 2018, 4 pages, to appear.

[C15] D. Di Nucci  
Methods and Tools for Focusing and Prioritizing the Testing Effort  
In Proceeding of the 34<sup>th</sup> IEEE International Conference on Software Maintenance and Evolution (ICSME) - Doctoral Symposium Track, Madrid, Spain, 2018, 5 pages, to appear.

[C14] D. Di Nucci, F. Palomba, A. De Lucia  
Evaluating the Adaptive Selection of Classifiers for Cross-Project Bug Prediction  
In Proceedings of the 6<sup>th</sup> International Workshop on Realizing Artificial Intelligence Synergies in Software Engineering (RAISE), Gothenburg, Sweden, 2018, 7 pages, 48 - 54.

[C13] P. Salza, F. Palomba, D. Di Nucci, C. D'Uva, A. De Lucia, F. Ferrucci  
Do Developers Update Third-Party Libraries in Mobile Apps?  
In Proceedings of the IEEE/ACM 26<sup>th</sup> International Conference on Program Comprehension (ICPC 2018), Gothenburg, Sweden, 2018, 11 pages, 255 - 265.

[C12] F. Geiger, I. Malavolta, L. Pascarella, F. Palomba, D. Di Nucci, A. Bacchelli  
A Graph-based Dataset of Commit History of Real-World Android apps  
In Proceedings of the IEEE/ACM 15<sup>th</sup> International Conference on Mining Software Repositories (MSR 2018), Gothenburg, Sweden, 2018, 5 pages, 30 - 33.

[C11] L. Pascarella, F. Geiger, F. Palomba, D. Di Nucci, I. Malavolta, A. Bacchelli  
Self-Reported Activities of Android Developers  
In Proceedings of the 5<sup>th</sup> IEEE/ACM International Conference on Mobile Software Engineering and Systems (MOBILESoft), Gothenburg, Sweden, 2018, 12 pages, 144 - 155.

[C10] D. Di Nucci, A. De Lucia  
The Role of Meta-Learners in the Adaptive Selection of Classifiers  
In Proceeding of 2<sup>nd</sup> Workshop on Machine Learning Techniques for Software Quality Evaluation (MaTeSQuE), Campobasso, Italy, 2018, 6 pages, 7 - 12.

[C9] 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 25<sup>th</sup> IEEE International Conference on Software Analysis, Evolution, and Reengineering (SANER 2018) – Campobasso, Italy, 2018, 10 pages, 612 - 621.

[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 39<sup>th</sup> 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 24<sup>th</sup> 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 24<sup>th</sup> 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 9<sup>th</sup> 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 31<sup>st</sup> 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 12<sup>th</sup> 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

- [J3] F. Palomba, D. Di Nucci, A. Panichella, A. Zaidman, A. De Lucia  
On the Impact of Code Smells on the Energy Consumption of Mobile Applications  
Elsevier Information and Software Technology (INFOSFT), to appear
- [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.

## SOFTWARE PROJECTS

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| <b>2017</b> | <p><b>ADOCTOR</b><br/> <a href="https://github.com/fpalomba/aDoctor">https://github.com/fpalomba/aDoctor</a><br/> ADOCTOR is a tool able to identify 15 Android-specific code smells from the catalogue by Reimann et al.</p> <p><b>PETRA</b><br/> <a href="http://tinyurl.com/je2nxkd">http://tinyurl.com/je2nxkd</a><br/> 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.</p> |
| <b>2015</b> | <p><b>LANDFILL</b><br/> <a href="http://soft.vub.ac.be/landfill/">http://soft.vub.ac.be/landfill/</a><br/> 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.</p>  |



23<sup>rd</sup> August 2018

David D. D.