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Civil status – Unmarried

Birthdate – September 21st, 1973

Citizenship – Italian

Military Service – Italian Navy,
completed in December 1999

Andrea Polini

Curriculum Vitae et Studiorum

Education

Doctor of Philosophy (PhD)

- I received a PhD degree, with honours, in 2004 from “**Scuola di Studi Universitari e di Perfezionamento Sant’Anna**” – Pisa (I).

Title of the dissertation: Testing Component-Based Software Systems

Collegio dei Docenti: Prof. Paolo Ancilotti, Ing. Antonia Bertolino, Ing. Giuseppe Lipari, and Dott.ssa Emilia Peciola

Short Abstract: In the thesis I propose novel methodologies for the functional and non functional testing of component-based software systems. Novel approaches for testing execution, model based evaluation, and performance evaluation are proposed and evaluated on real case studies. Particular attention is devoted to the composition of black-box components externally acquired and poorly documented by the developer.

Laurea in Scienze (MSc)

- I received a Laurea degree in 2000 from **Università degli Studi di Pisa in Scienze dell’Informazione** (Computer Science), with full marks and honours (110/centodieci e Lode).

Title of the dissertation: The Diagnosis Program of APEmille [in italian]

Advisor: Prof. Piero Maestrini

Short Abstract: The thesis presents an implementation of the diagnosis algorithm used by the APEmille calculator (a Single Instruction Multiple Data – SIMD – massive parallel computer, developed by the Italian Institute for Nuclear Physics – INFN) for detecting possible multiple faults that can affect the processors composing the machine. The algorithm has been implemented in C++ and evaluated thanks to the development of a simulator that has permitted to statistically assess the real capability of the algorithm of correctly identifying possible faults. Finally a graphical interface has been implemented, using the QT libraries, to make the localisation of the faulty processors easier.

Other formative activities

TAROT summer school

- From June 27th to July 1st, 2005, I attended the TAROT Summer school organised in Paris by the “Institut National des Télécommunications (INT)” in which part of the work that I carried on during my PhD has been presented by Prof. Antonia Bertolino.

Education (continued)

University College of
London (UCL)

- In 2003 I spent six months at the Software Engineering Laboratory of the University College of London ([UCL](#)). Under the supervision of Prof. Wolfgang Emmerich I have been involved in researches in the area of **performance evaluation of distributed component-based software systems**.

14th Lipari Summer
School

- From June 30th to July 13th, 2002 I attended the Fourteenth International School for Computer Science Researcher at Lipari Island. The topic of that year was **“Software Engineering”** and eight courses on different aspects of the discipline have been held.

13th Lipari Summer
School

- From July 1st to July 14th, 2001 I attended the thirteenth International School for Computer Science Researcher at Lipari Island. The topic of that year was **“Foundations of Wide Area Network Programming”** and seven courses on different aspects of the discipline have been held.

Research Interests

Software Testing is the broad term that can better characterise my research activities and interests. In particular I am strongly interested in research aiming at introducing novel methodologies for testing emerging software technologies. A strong motivation in my activities is the will of introducing sound techniques for the automatic, and model based, derivation of test cases. In my work I generally considered models expressed using the Unified Modeling Language.

Most of the work that I carried on during my PhD has been oriented on testing Component Based Systems. Considering such context my activities are currently focused on many different aspects. The first is the derivation of new frameworks for better testing software components when integrated in the final environment [RJP2005, PB2005, ICSE2003, Fidji2002]. Besides I am strongly interested in methodologies for the derivation of test cases for the evaluation of components to be deployed [TACoS2003, DSN2004], starting from architectural descriptions.

Recently I also started to study the monitoring of component based systems. The aim is to investigate which and how run-time information can be used to discover behaviour that diverge from the specified one. Finally I am also interested in the usage of testing as an empirical way for the characterisation of non functional properties, with particular emphasis on performance, of component based software systems [WOSP2004, DPE2005].

Testing of Web Services is another topic in which I am currently working [Euromicro2005, BFPT2005]. Given the characteristic of this technology, the main target is to develop methodologies for the derivation of test cases that will allow the developer of new services to effectively assess interoperability issues concerning his/her services when interacting with other services. The intention is to apply in this context formal techniques for test case derivation successfully studied and applied in the area of protocol conformance testing. Related to the integration of different services and/or tools I am involved in researches for the automatic generation of XML instances from XML Schema [BGMP2005]. XML is in fact today the standard notation used for the exchanging of data between different software artifacts.

Research Interests (continued)

Finally being involved in e-Learning projects I acquired a good knowledge on technologies enabling e-Learning. In this context I cooperated in defining which are the main testing objectives to pursue considering the specific domain [ICMTL2005]. For the future I plan to continue the study and if possible to effectively use such technologies for the development of e-Learning courses.

Professional Experiences

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| European Project | <ul style="list-style-type: none">• I am currently involved, as a member of the Software Engineering Laboratory of ISTI, in the European project TELCERT (Technology Enhanced Learning: Certification – European Requirements and Testing). TELCERT is a Technology Enhanced Learning research and development project under the European Union's 6th Framework programme. Led by a consortium of e-Learning providers, research and industry organisations, TELCERT will develop innovative software testing and conformance systems to assure interoperability in e-Learning content and technology. |
| European Project | <ul style="list-style-type: none">• Starting in 2006 I will be involved in the "Providing dependable and Adaptive Service Technology for pervasive Information and Communication (PLASTIC)" European project. The PLASTIC project aims to offer a comprehensive development methodology for software services to be deployed over the next generation wireless network. |
| Marie Curie Network | <ul style="list-style-type: none">• I am a member of the Training And Research On Testing (TAROT) network of excellence. The network aims to strengthen and develop the collaboration among major European testing communities. |
| Teaching | <ul style="list-style-type: none">• In 2001 I have been assistant professor for the course "Laboratorio di Programmazione Concorrente" (Concurrent Programming Laboratory) at Computer Science Department of the University of Pisa. <p>From May 10th to May 23rd, 2005 I have been a Teacher of "Informatica" at Liceo Scientifico "Filippo Buonarroti" - Pisa</p> |
| Program Committees | <ul style="list-style-type: none">• Program Committee Member of the IADIS International Conference on Applied Computing 2005 (AC 2005), Algarve, Portugal, 22-25 February 2005. <p>Program Committee Member of the "<i>Component Models for Dependable Systems</i>" Special track of the 31st Euromicro Conference on Software Engineering and Advanced Applications (SEAA), Porto, Portugal, August 30th-September 3rd, 2005.</p> <p>Program Committee Member of the 3rd International Working Conference on Component Deployment (CD 2005), November 28th-29th, 2005 Grenoble, France.</p> |

Professional Experiences (continued)

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| Reviewing | <ul style="list-style-type: none">• I have been a reviewer for several conferences and journals, such as ICSE 2003, 2004, 2006, DSN 2004, ESEC/FSE 2003, 2005, FASE 2005, IEEE Transaction on Software Engineering, ACM Transaction on Software Engineering and Methodologies. |
| Organization activities | <ul style="list-style-type: none">• I am the Program Chair of the Workshop on Web Services Modeling and Testing (WS-MaTe). Palermo, Italy, June 9th, 2006. <p>Currently I am involved in the organization of a workshop accepted at ICSE 2006. Title of the workshop is "Service Oriented Software Engineering (SOSE 2006)" and the focus will be on the engineering of Web Services application.</p> |

Technical Skills

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| | <ul style="list-style-type: none">• During my PhD I worked with several different technologies and I got a good knowledge on different subjects. Below the main area in which I conducted my researches. |
| Middleware | <ul style="list-style-type: none">• I made extensive studies on methodologies and technologies for distributed computing in particular in the area of Object-Oriented middleware. I have a good knowledge of technologies such as CORBA, and JavaRMI. |
| Component-Based Models | <ul style="list-style-type: none">• I have a good knowledge on the most widely used desktop and distributed component based model (COM, JavaBeans, EJB, CCM). I also conducted several experimentation using the EJB component model in particular using a JBoss 4.0 application server. |
| Web Services | <ul style="list-style-type: none">• I am currently involved in the development of novel testing techniques in the area of Web Services. Correspondingly I acquired good skills with standards and related technologies such as SOAP, WSDL and UDDI. |
| Languages | <ul style="list-style-type: none">• I have a deep knowledge of the concepts underneath object-oriented languages. I have also a strong confidence with the Java language (and related technologies) and a good knowledge of C++. In the area of modelling languages I have a good expertise with the Unified Modeling Language UML and a basic knowledge of the Model Driven Architecture (MDA). |
| Mark-up Languages | <ul style="list-style-type: none">• I have a good knowledge of the XML meta language and of the related technologies such as XML Schema, XPath, XSLT, and Schematron. |
| Operating Systems | <ul style="list-style-type: none">• I am a Linux user and I have a good knowledge of the most important administrative tasks for this OS. I can also use MS Windows as a standard user. |
| e-Learning | <ul style="list-style-type: none">• I am acquainted with technologies and processes for developing and providing e-Learning contents. |

Languages

- Italian • Mother tongue
- English • Fluent in writing, reading and speaking.
- French • Good knowledge.

Scientific Publications

Journals and Books

- [PB2005] • Polini Andrea, Bertolino Antonia, “A Customer Oriented Framework for Component Deployment Testing”, Testing Commercial-off-the-Shelf Components and Systems, Sami Beydeda and Volker Gruhn Eds., ©Springer-Verlag 2005, pp. 169-194.
- [DPE2005] • Denaro Giovanni, Polini Andrea, Emmerich Wolfgang, “A Performance Prediction Strategy for Distributed Software Applications”, in Testing Commercial-off-the-Shelf Components and Systems, Sami Beydeda and Volker Gruhn Eds., ©Springer-Verlag 2005, pp. 293-314.
- [P2005] • Polini Andrea: “Interoperability Testing of Web Services for e-Learning”, accepted for publication in *Elektrotechnik & Informationstechnik (e&i)* journal of Springer Verlag.
- [BFPT2005] • Bertolino Andrea, Frantzen Lars, Polini Andrea, Tretmans Jan: “Audition of Web Services for Testing Conformance to Open Specified Protocols” submitted to *Architecting Systems with Trustworthy Components* Judith Stafford, Ralf Reussner, Clemens Szyperski (Eds.), special issue in the Lectures Notes for Computer Science Series.
- [BGMP2005] • Bertolino Antonia, Gao Jinghua, Marchetti Eda, Polini Andrea: “Partition Testing from XML Schema” submitted to IEEE Software.
- [RJBP2005] • Jaffar-ur Rehman Muhammad, Jabeen Fakhra, Bertolino Antonia, Polini Andrea: “Software Component Integration Testing: A Survey” submitted to *Software Testing, Verification and Reliability* journal published by John Wiley and Sons.

International Referred Conferences and Workshops

- [Euromicro2005] • Bertolino Antonia, Polini Andrea, “The Audition Framework for Testing Web Services Interoperability”, Proceedings of 31th Euromicro Conference on Software Engineering and Advanced Applications, (EUROMICRO 2005), Porto, Portugal, 2005, August 30th - September 3rd, pp. 134-142.
- [ICMTL2005] • Bertolino Antonia, Hermann Hans-Christian, Marchetti Eda, Polini Andrea, “Addressing Testing Objectives for e-Learning”, Proceedings of 1st International Conference on Methods and Technologies for Learning, ICMTL 2005, Palermo Italy, March 08-11, WITPress, WIT Transactions on Informations and Communication Technologies (ISSN 1743-3517) Vol. 34, Pag. 401-409.

Scientific Publications (continued)

- [AC2005] • Gao Jinghua, Marchetti Eda, Polini Andrea, "Applying Advanced UML-based Testing Methodologies to e-Learning", in Proceedings of the International Conference on Applied Computing (AC 2005), Faro, Portugal, February 22nd-25th, 2005.
- [DSN2004] • Bertolino Antonia, Inverardi Paola, Muccini Henry, Polini Andrea, "Towards Anti-Model Based Testing", in Proceedings of Fast Abstract Session at IEEE International Conference on Dependable Systems and Networks DSN 2004, Florence, Italy, June 29-July 1, 2004, pp. 124-125.
- [WOSP2004] • Denaro Giovanni, Polini Andrea, Emmerich Wolfgang, "Early Performance Testing of Distributed Software Applications", in Proceedings of International Workshop on Software Performance (WOSP04), January 14-16, 2004, Redwood City, California, pp. 94-103
- [SNPD2003] • Marchetti Eda, Martelli Francesca, Polini Andrea, "Refactoring a Legacy System using Components", Proceedings of SNPD 2003, October 16th-18th, 2003, Lubeck, Germany.
- [ICSE2003] • Bertolino Antonia, Polini Andrea, "A Framework for Component Deployment Testing", in Proceedings of the ACM/IEEE International Conference on Software Engineering ICSE 2003, Portland, USA, May 3-10, 2003, pp. 221-231.
- [TACoS2003] • Bertolino Antonia, Marchetti Eda, Polini Andrea, "Integration of "Components" to Test Software Components", in Proceedings of TACoS 2003, Warsaw, Poland, April 13th, 2003.
- [Fidji2002] • Bertolino Antonia, Polini Andrea, "WCT: a Wrapper for Component Testing", Proceedings of Fidji'2002 LNCS 2604, Luxembourg, November, 28-29 2002.
- [CBSE2002] • Bertolino Antonia, Polini Andrea, "Re-thinking the Development Process of Component-Based Software", Proceedings of the workshop CBSE, Composing Systems from Components, April 10-11, 2002, Lund, Sweden.

Pisa, November 21, 2005

Andrea Polini PhD