

Maristella Matera - Curriculum Vitae

Maristella Matera graduated in Computer Science at University of Bari in 1994 (Laurea degree, 110 out of 110, cum laude). Since then, she has been performing academic research. Since December 2010 she is Associate Professor at Dipartimento di Elettronica, Informazione e Bioingegneria (DEIB), Politecnico di Milano.

Previously:

- From 1997 to 2010, she has been PhD student (1997-2000), post-doc researcher (2000-2002) and permanent researcher (2002-2010) at DEIB.
- In 1996 she was visiting researcher at the College of Computing of Georgia Tech, Atlanta.
- In 1995 she was fellow at the CNUCE research institute, Pisa, Italy.
- In 1994 she was research assistant at University of Bari.
- In 1993 she was an undergraduate fellow at the research lab of Olivetti Ricerca, at that time one of the biggest Italian companies active in the Italian computer science scenario.

She is author of more than 150 articles on international journals and conference proceedings. A list of the most significant publications is available on

- DBLP (<http://www.informatik.uni-trier.de/~ley/pers/hd/m/Matera:Maristella>)
- Google Scholar (<http://scholar.google.it/citations?user=NScXYC0AAAAJ&hl=it&oi=ao>).

Some such papers also won the best paper/best demo award at three different editions of the ICWE conference (2004: best paper; 2007 and 2013: best demo). ICWE (International Conference of Web Engineering) is one of the main conferences in the field of Web Engineering.

She is also co-author of three international books:

- “Designing Data-Intensive Web Applications”, Morgan Kaufmann, 2002, together with S. Ceri, P. Fraternali, A. Bongio, M. Brambilla and S. Comai.
- “Engineering Web Applications”, series on “Data Centric Systems and Applications”, Springer-Verlag, 2009, together with S. Casteleyn, F. Daniel and P. Dolog.
- “Mashups: Concepts, Models and Architectures”, series on “Data Centric Systems and Applications”, Springer-Verlag, July 2014, together with F. Daniel.

and of the Italian book:

- S. Ceri, P. Fraternali, A. Bongio, M. Brambilla, S. Comai and M. Matera. Progettazione di Dati e Applicazioni per il Web. McGraw-Hill, July 2003.

BIBLIOMETRIC DATA

By using the “Publish-or-Perish” open-source software, based upon Google-Scholar, the cumulative production of Maristella Matera in the last decade yields 160 papers, with about 3600 citations and an H-index of 29 (as of May 2017).

RESEARCH TOPICS

Maristella Matera’s research focuses on theoretical, methodological and experimental aspects in the field of Web Engineering. In particular, she achieved results on the following research themes:

Current Research (last ten years)

- *Mashup models and tools*. During the last ten years Maristella has been investigating models, domain specific languages and tools for the development of Web and mobile mashups. The research has been focusing on the application of concepts typical of Web Services to autonomous components provided with a proper UI. The aim has been to define frameworks for the mashup-like integration of stand-alone modules or applications, where integration occurs especially at the presentation layer. The research has also led to the development of a platform that offers visual, live programming mechanisms for the definition of mashups and generates automatically application code that can be deployed on different devices, also with a distribution logic for the collaborative creation and execution of the resulting mashups. This research also led to the publication of the Book “Mashups: Concepts, Models and Architectures”, series on "Data Centric Systems and Applications", Springer-Verlag, July 2014, written together with F. Daniel.
- *Elastic design principles for actionable, interactive workspaces*. Due to the emergence of new technologies and the data deluge we are assisting today, there is an ever increasing need for effective approaches supporting people to find the “right” facts and make them “actionable” according to their tasks. The research on elastic design principles, conducted in cooperation with researchers from SAP (Walldorf, Germany) and University of Bari, focuses on methods for the exploration and seamless composition of heterogeneous data sources by end users, so that the retrieval of information as well as the transitions across different usage situations and the related possible analysis tasks are supported without requiring the end user to switch among different isolated applications. The goal is to define elastic environments where relevant information and functions that can be performed on it can be shaped by end users at runtime. The main idea is to exploit methods for the mashup of heterogeneous resources and elastic features that permit the easy transition of information between different task contexts according to the recently proposed notion of Transformative User Experience.
- *Design methods and development tools for Context-aware Mobile Mashups*. Given the plethora of data and services today available online, it is often difficult to find on-the-fly the information or the applications that are appropriate to the current context of use. This is even more true in the mobile scenario, where device resources (memory, computational power, transmission budget) are still limited. Given this evidence, this research focuses on the definition of methods and tools for the design and development of Context-Aware Mobile mashUpS (CAMUS). CAMUS apps dynamically collect and integrate data from documental, social and Web resources (accessed by means of Web APIs) and adapt the integrated content to the users' situational needs. They can offer multiple advantages thanks to their intrinsic capability of identifying pertinent data sources, selected on the basis of their adequateness with respect to the current users' needs, and pervasively presenting them to the final user in form of integrated visualizations deployed as mobile apps.

This application paradigm overcomes the limits posed by pre-packaged apps and offers to users flexible and personalized applications whose structure and content may even emerge at runtime based on the actual user needs and situation of use. The CAMUS framework does not only propose a new application paradigm; rather, it paves the way to novel design methodologies and related tools for fast prototyping of mobile mashups, where context becomes a first-class modeling dimension improving *i)* the identification of the most adequate resources that can satisfy the users' information needs and *ii)* the consequent tailoring at runtime of the provided data and functions.

- *End User Development of Distributed Interactive Workspaces*. So far, mashups have been especially conceived as personal Information spaces, i.e., vertical applications solving situational needs, assembled by end users by merging ready-to-use resources. In several domains, however, the involved stakeholders need to share, co-create and execute mashup applications in a distributed manner. This research theme therefore relates to adoption of End-User Development (EUD) paradigms to provide visual, live programming paradigms letting users, not necessarily experts of technologies, create service-based, interactive Web applications. A novel contribution is to enable the collaborative creation and use of Distributed Interactive Workspaces (DIWs), i.e., component-based interactive applications, whose content is produced by end users via the aggregation and manipulation of data fetched from distributed online resources, that can be deployed as personal applications or can exploit a centralized, server-side execution logic to manage the sharing of workspaces among different users, the propagation of collaborative actions to active instances of a same workspace, and the distributed execution of a whole workspace or of selected components on different devices employed by different users. The resulting platform has been successfully applied to real usage scenarios in e-Learning and Cultural Heritage.
- *Quality models for Web 2.0*. This research activity focuses on models, methods and technologies for the analysis the quality of Web 2.0 resource. The aim is to support users in the selection of quality resources. Covering these requirements raises a number of issues. First, relevant and authoritative Web sources must be selected. We have shown that grounding the analysis of sources on data quality dimensions improves this task. Second, the end users should be guided to compose the information access functionalities they need. We therefore propose a model for assessing the quality of mashup resources and of their composition that lead to a quality-aware development process. The method has been integrated within a platform for mashup development.

Past Research

- *Conceptual models for data-intensive Web applications*. This research focused on the definition of a methodology for the design of data-intensive Web applications, which is based on the adoption of a conceptual model, WebML, one of the most adopted models for the design of data-intensive applications, and of a suite of software tools for the model-driven automatic generation of the Web application code. The research also investigated how to capture and specify through conceptual model for the *Web adaptivity* rules expressing context events, conditions and actions to be managed by Web applications to react to context changes. The concept of *active context-awareness* has been investigated, focusing on the importance of user-independent, context-triggered adaptivity actions. We have therefore introduced the notion of context monitor, realized thanks to RIA technologies, that operates autonomously and transparently in the background to provide suitable active support, and that leads to interpreting context as “first class actor”, operating independently from users on the same hypertext the users navigate.

- *Cooperative processes on the Web*. This activity has led to the definition of a set of modeling abstractions and a methodology for the model-driven design of flexible cooperative processes that have been applied for the development of a collaborative platform supporting the so-called “project-centered learning”. The novelty of this research is that the resulting collaborative environment enables end-users (e.g., students working in team) to define dynamic and flexible processes supporting their cooperation: at execution time, not only users can define processes, but they can also modify the processes to satisfy new requirements emerged during the collaborative work.

RESEARCH PROJECTS (last 10 years)

- 2015: **Intelligence Matters**. Project financed by Regione Lombardia within the funding program “Moda e Digitale” (Fashion and Digital).
- 2013-present: **SHELL** (Shared Interoperable Home Ecosystems for a Green, Comfortable and Safe Living – Technology Cluster, 2013-2015). Project funded by the Italian Ministry of University and Research.
- 2011: **Analysis of Business Information Systems**. Project funded by SOGEI, an Italian Information Technology company owned by the Ministry of the Economy and Finance.
- 2009-2014: Investigator in **SeCo** (Search Computing) Advanced Grant ERC.
- 2005-06: Investigator in **COOPER** (Collaborative Open Environment for Project-Centered Learning), UE-STREP project.
- 2003-06: Investigator in **ProLearn** (Professional Learning), UE-Network of Excellence.

AWARDS

- July 2001: Grant from Polytechnic of Milan as “**Best Young Researcher**”, to support the research titled “Design and development of data-intensive Web applications”.
- July 2004: The paper: S. Ceri, P. Dolog, M. Matera, W. Nejdl. “Model-Driven Design of Web Applications with Client-Side Adaptation”. Proc. of ICWE’04, Monaco, Germania, July 2004, LNCS 3140, Springer, won the “**Best Paper**” award (full paper acceptance rate: 13%).
- July 2007: The paper: J. Yu, B. Benatallah, F. Casati, F. Daniel, M. Matera and R. Saint-Paul. “Mixup: a Development and Runtime Environment for Integration at the Presentation Layer”. Proc. of ICWE’07, Como, July 2007, LNCS 4607, Springer, won the “**Best Demonstration**” award.
- September 2012: The paper: C. Cappiello, M. Matera, M. Picozzi, F. Daniel, A. Fernandez. “Quality-Aware Mashup Composition: Issues, Techniques and Tools”. Proc. of QUATIC 2012, Lisbon, Portugal, Sept. 2012, IEEE Press, was nominated for the “**Best Paper**” award.
- July 2013: The paper: M. Matera, M. Picozzi, M. Pini, M. Tonazzo. “PEUDOM: A Mashup Platform for the End User Development of Common Information Spaces”. Proc. of ICWE 2013, Aalborg, Denmark, July 2013, Springer, won the “**Best Demonstration**” award.

CHAIRING OF SCIENTIFIC EVENTS

International Conferences:

- ACM AVI (International Symposium on Advanced Visual Interfaces). 2016 and 2014: Program Co-Chair.
- ACM CHIItaly (Conference of the Italian SIGCHI Chapter). 2015: Publication Chair; 2013: Doctoral Consortium Chair.

- IEEE QUATIC (Quality of Information and Communications Technology). 2014: Chair of the “Quality in Web Engineering” Track.
- MobiWIS (International Conference on Mobile Web Information Systems). 2013: Workshop Co-Chair.
- ICWE (International Conference on Web Engineering). 2013: Tutorial Co-Chair; 2007: Publicity Chair; 2004: Workshop Co-Chair.
- ECSS (European Computer Science Summit). 2011: Local Organization Chair.
- CIKM (ACM 17th Conference on Information and Knowledge Management). 2008: Chair of the track “User experience: languages, models, and interfaces”.
- ACM SAC (Symposium on Applied Computing). 2003-2005: Co-chair of the Track “Web Technologies and Applications”.

International Workshops:

- Member of the Steering Committee of the Workshop QWE (Quality in Web Engineering), 2012 and 2013.
- Co-Chair of the Workshop Mashups 2012, held in conjunction with ESOC 2012, Bertinoro, Italy, September 2012.
- Co-Chair of the Workshop QWE (Quality in Web Engineering), held in conjunction with ICWE 2010 (Vienna, Austria) and ICWE 2011 (Paphos, Cyprus).
- Member of the Steering Committee of the Workshop ComposableWeb, 2009 and 2010.
- Co-Chair for the Workshop IWWUA (International Workshop on Web Usability and Accessibility), held in conjunction with WISE 2007 (Nancy, France), WISE 2008 (Auckland, New Zealand) and ICWE 2009 (Poznan, Poland) .
- Co-Chair for the Workshop AEWSE (International Workshop on Adaptation and Evolution in Web Systems Engineering), held in conjunction with ICWE 2006 (Palo Alto, California) and ICWE 2007 (Como, Italy).
- Co-Chair for the Workshop UMICS (International Workshop on Ubiquitous and Mobile Information Systems) held in conjunction with CAISE 2003 (Klagenfurt, Austria) and CAISE 2004 (Riga, Latvia).

PARTICIPATION TO PROGRAM COMMITTEES OF INTERNATIONAL CONFERENCES

- ICWE (main program, demo track, doctoral consortium) - International Conference on Web Engineering, 2005-2017.
- COOPIS - International Conference on Cooperative Information Systems, 2004-2017.
- EICIS – Engineering Interactive Computing Systems: Demo Track, 2014; Program Committee Member, 2017.
- IEEE QUATIC (Quality of Information and Communications Technology), 2012-2014.
- SEMAPRO - International Conference on Advances in Semantic Processing, 2013-2014.
- IEEE ICEBE – International Conference on e-Business Engineering – Coventry, UK, 2013.
- INTERACT – IFIP International Conference on Human-Computer Interaction - Cape Town, South Africa, 2013.
- MobiWIS– International Conference on Mobile Web Information Systems – Paphos, Cyprus, 2013.
- WWW (Track on Web Engineering) - International Conference on World Wide Web, 2012.
- MoMM - Int. Conference on Advances in Mobile Computing & Multimedia - 2008-2012.

Maristella also regularly serves as program committee member for different international Workshops.

ASSOCIATION MEMBERSHIPS

- **Founding member of the ACM Italian Chapter of SIGCHI** (Special Interest Group On Computer-Human Interaction).

TEACHING

Since 2011 Maristella Matera has been teaching courses on Computer Science Fundamentals (“Fondamenti di Informatica”), and Algorithms and Data Structures (“Algoritmi e Principi dell’Informatica”) for the BSc Degree in Computer Science and Engineering, and Interaction Design (“Laboratorio di Sistemi per l’Interazione”) for the MSc degree in Communication Design.