

# Moreno Marzolla CV

First and Last Name

Moreno Marzolla

Sex

Male

Mailing Address

Dipartimento di Scienze dell'Informazione  
Università di Bologna  
Mura Anteo Zamboni 7, I-40127 Bologna, Italy

Visit Address

via Malaguti 1/D (room 9), I-40127 Bologna, Italy

Phone

+39 051 20 94847

Fax

+39 051 20 94510

Email

marzolla@cs.unibo.it

Home Page

<http://www.moreno.marzolla.name/>

Language skills

Italian (native), English (good written/spoken), French (basic)

## Positions Held

nov 2009—present

Assistant Professor (*ricercatore universitario*) at the Dipartimento di Scienze dell'Informazione, Università di Bologna, Italy. My research interests include performance modelling of complex systems, discrete-event simulation, software engineering, application of queueing network theory, and distributed systems. I teach Algorithms and Data Structures for the undergraduate degree in *Informatica per il Management*.

may 2008—oct 2009

I worked at the Istituto Nazionale di Fisica Nucleare (INFN) Padova, Italy, in the EU EGEE-3 (Enabling Grids for E-sciencE) project <http://www.eu-egee.org/>, JRA1 activity (Middleware Re-engineering). I worked on the gLite Grid middleware; in particular, I co-developed the ICE (Interface to Cream Environment) component of the gLite Workload Management System, and helped support the BES (Basic Execution Service) and JSDL (Job Submission Description Language) specifications within the CREAM Computing Element. More informations can be found at <http://grid.pd.infn.it/cream/>. Relevant publications: [INFN/TC\_08/6] [AM09] [AAB+09] [A+09].

may 2006—apr 2008

I worked at the Istituto Nazionale di Fisica Nucleare (INFN) Padova, Italy, in the OMII-Europe (Open Middleware Infrastructure Institute) project, JRA1 activity (Re-engineering of services). My work was focused on the analysis, implementation and extension of the JSDL (Job Submission Description Language) and BES (Basic Execution Service) specifications within the CREAM computing element on the gLite software infrastructure. More informations on this activity can be found on the activity wiki page <http://grid.pd.infn.it/omii/>. Relevant publications: [AAB+07]

[MMR+07] [RMM+08]. The project deliverables and milestones are available as well: [OMII08-2] [OMII08] [OMII07-3] [OMII07-2] [OMII07] [OMII06] [R+09] [AAG+10].

apr 2005—apr 2006

I worked at the Istituto Nazionale di Fisica Nucleare (INFN) Padova in the EU EGEE (Enabling Grid for E-sciencE) project, JRA1 Activity (Middleware Reengineering and Integration). I worked on the development of a Computing Element (CE) service for the gLite Grid infrastructure. The CE is the Grid component which is responsible for execution of computational jobs. At INFN Padova we develop CREAM (Computing Resource Execution and Management), a Java application running inside an Axis container in the Tomcat application server. CREAM exposes a webservice-based interface allowing users to submit and manage computational jobs which will be executed on an underlying batch system. I worked initially on the development of the CREAM service itself, then moved to the co-development of ICE (Interface to Cream Environment), a C++ component which allows the gLite Workload Management System (WMS) to submit jobs to CREAM-based CE. Relevant publications: [A+07] [A+07-2] [VM+06] [A+06].

mar 2003—apr 2005

I was a post-doc researcher at the Dipartimento di Informatica, Università Ca' Foscari di Venezia, supported by the FIRB project “Performance Evaluation of Complex Systems: Techniques, Methodologies and Tools”. My research areas included: development of methodologies and tools for complex systems modeling, in particular software systems; analytical and approximate solution techniques for Queuing Network models with blocking; development of general-purpose simulation tools and libraries to support the above activities. Some relevant publications: [BMM06] [BM05] [BMM04] [MB04] [M04] [BDIM04]

nov 2000—oct 2003

I was a PhD student in Computer Science at the Dipartimento di Informatica, Università Ca' Foscari di Venezia, Italy, under the supervision of prof. Simonetta Balsamo. My initial research focused on methods and platform for distributed, discrete-event simulation. I developed a distributed simulation library written in C++ and using the MPI message-passing libraries. This work was presented in [M01]. I then worked on performance evaluation of software systems from UML specifications. In particular, I investigated the use of simulation as the performance model, and annotated UML Use Case, Activity and Deployment diagrams as the software specification model. The proposed simulation-based modeling approach has been implemented in the UML-PSI tool. The tool parses annotated UML specifications, automatically derives a simulation model which is then executed. Performance results are reported back at the UML level as additional annotations. During the years 2001-2002 my work was partially supported by the MIUR national project “Sahara: Software Architectures for Heterogeneous Access Network Components”. Since 2002 my work was supported by the FIRB national project “Performance Evaluation of Complex Systems: Techniques, Methodologies and Tools”. Relevant publications: [BM03-3] [BM03-2] [BM03] [M04].

sep 2001—feb 2004

I was with INFN Padova as a an external collaborator. I developed a monitoring system for a large computing cluster of about 180 dual-processor machines which is used for processing of data from the BaBar experiment. The monitoring system, written in C++, used the SNMP protocol to monitor the computing nodes and the network switch. Relevant publications: [M03] [MM03] [ACD+03].

nov 1998—jan 1999, nov 1999—sep 2001

I received a studentship from the Istituto Nazionale di Fisica Nuclare (INFN), Padova, Italy, to work on the BaBar experiment which was located at the Stanford Linear Accelerator Center, Menlo Park, California. I took part in the development of software for data transfer between SLAC and worldwide distributed regional computing centers. I gained significant skills with different programming

languages (C++/Perl/Tcl-Tk/Bash) and with the OO database management system Objectivity [BA01] [BA01-2]. I spent several research and work periods at the Stanford Linear Accelerator Center.

## Education

### Studies

2004

Dottorato di Ricerca in Informatica (PhD in Computer Science), Università Ca' Foscari di Venezia. PhD thesis: *Simulation-Based Performance Modeling of UML Specifications*. Thesis defended on feb 5, 2004. Advisor: prof. Simonetta Balsamo.

1998

Laurea in Scienze dell'Informazione (MSc in Computer Science) with full marks and honors (110/110 cum laude), Università Ca' Foscari di Venezia. Thesis: *Algoritmi Deterministici per il mantenimento di Proprietà su Grafi Dinamici* (Deterministic Algorithms for Maintaining Dynamic Graph Properties). Thesis defended on mar 16, 1998. Advisor: prof. Giuseppe F. Italiano.

1993

Diploma di Ragioniere Perito Commerciale e Programmatore (high school accountancy degree), Istituto Tecnico Commerciale "E. De Amicis", Rovigo. Final marks: 60/60.

### Advanced Courses

PhD school *Scuola Nazionale dei Dottorati in Informatica delle Facoltà di Scienze*, Bertinoro (Forlì), Italy, may 21—june 5, 2001. I attended the following courses; for those with (\*), I also took and passed the final exam:

- *Sistemi Distribuiti su Larga Scala* (Large-Scale Distributed Systems) (\*), prof. Fabio Panzieri
- *Algoritmi Probabilistici* (Probabilistic Algorithms) (\*), prof. Andrea Clementi
- *Verifica di programmi via interpretazione astratta* (Program Verification via Abstract Interpretation), prof. Giorgio Levi

PhD school on *Foundations of Wide Area Network Programming*, 13th International School for Computer Science Researchers, Lipari Island, Italy, july 1—14, 2001. I attended the following courses; for those with (\*) I also took and passed the final exam:

- *Security Protocols and Formal Methods* (\*), prof. Martin Abadi;
- *Principles of Wide Area Programming* (\*), prof. Luca Cardelli;
- *The Extensible Markup Language* (\*), prof. Michail I. Schwartzbach;
- *Mobility, Security and proof-carrying code* (\*), prof. Peter Lee;
- *Coordination Languages and Models*, prof. Paolo Ciancarini;
- *Concurrent Object-Oriented Programming*, prof. Doug Lea;
- *Java, Jini and Related Technologies*, prof. Jim Waldo;

PhD Courses taken at the Department of Computer Science, Università Ca' Foscari di Venezia, for which I also passed the final exam:

- *Calcolo Parallelo* (Parallel Computing), prof. Salvatore Orlando;
- *Simulazione* (Simulation), prof. Simonetta Balsamo and prof. Lorenzo Donatiello.

## Research Projects I worked on

may 2008—oct 2009

EU project EGEE-3 (Enabling Grids for E-science) (<http://www.eu-egee.org/>). I worked in the JRA1 Activity (Middleware Re-engineering).

may 2006—apr 2008

EU project OMII-Europe (Open Middleware Infrastructure Institute-Europe) (<http://www.omii-europe.org/>). Coordinator of the JRA1/Job Submission and Monitoring task (<http://grid.pd.infn.it/omii/>).

may 2005—apr 2006

EU project EGEE (Enabling Grids for E-science) (<http://public.eu-egee.org/>)

nov 2003—apr 2005

MIUR Research Project FIRB “Performance Evaluation of Complex Systems: Techniques, Methodologies and Tools” (<http://www.perf.it/>)

2001—2002

MURST Research Project “Sahara: Software Architectures for Heterogeneous Access Network Components”

1999—2001

BaBar Project (<http://www.slac.stanford.edu/BFROOT/>)

## Other activities

I have been **Local Organization Chair** of the ACM MSWIM (Modeling and Simulation of Wireless and Mobile Systems) International Conference and affiliated PA-WASUN workshop, Venice, 4-7 october 2004.

I have been **referee** for several international conferences: Performance 2002; ACM Conference on Modeling and Simulation of Wireless and Mobile Systems (MSWIM 2004); First International Conference on the Quality of Software Architectures (QoSA 2005); 9th Int. Conf. on Reliable Software Technologies, Ada-Europe 2004; Workshop on Software and Performance (WOSP 2004); Workshop on Software and Performance (WOSP 2005); European Simulation and Modelling Conference (ESMc'05); ACM Conference on Modeling and Simulation of Wireless and Mobile Systems (MSWiM 2005); Second International Conference on the Quality of Software Architectures (QoSA 2006); 20th annual European Simulation and Modelling Conference (ESM2006); ACM Conference on Modeling and Simulation of Wireless and Mobile Systems (MSWiM 2007); 3rd International ICST Conference on Simulation Tools and Techniques (SimuTOOLS 2010); Fourth IEEE International Conference on Self-Adaptive and Self-Organizing Systems Budapest (SASO 2010).

I have been **referee** for the following journals: Performance Evaluation Journal (Elsevier), Journal of Zhejiang University Science A; Parallel Computing (Elsevier); Software-Practice and Experience (John Wiley and Sons); Journal of Grid Computing (Springer); IEEE Transactions on Computers; ETRI Journal.

I have been **program committee member** of the following conferences and workshops:

- European Simulation and Modeling Conference (ESMc'05), Porto, Portugal, oct 22-24 2005;
- 20th Annual European Simulation and Modelling Conference (ESM2006), Toulouse, France, oct 23-25 2006;
- International Grid Interoperability and Interoperation Workshop 2007 (IGIIW 2007) in conjunction with 3rd IEEE International Conference on e-Science and Grid Computing (e-Science 2007), Bangalore, India, dec 10-13, 2007;
- European Simulation and Modeling Conference (ESM'07), October 22-24, 2007, St. Julian's, Malta;
- European Simulation and Modeling Conference (ESM'08), October 27-29, 2008, Le Havre, France;
- International Grid Interoperability and Interoperation Workshop 2008 (IGIIW 2008) in conjunction with 4rd IEEE International Conference on e-Science and Grid Computing (e-Science 2008);
- First International Workshop on the Quality of Service-Oriented Software Systems (QUASOSS), in conjunction with the 7th ESEC/FSE joint Meeting, aug 2009;
- European Simulation and Modeling Conference (ESM'09), October 26-28, 2009, Leicester, United Kingdom.
- 2nd International Workshop on the Quality of Service-Oriented Software Systems (QUASOSS), in conjunction with ACM/IEEE International Conference on Model Driven Engineering Languages and Systems, Oslo, Norway, October 3—8, 2010

From may 2006 to apr 2008 I coordinated the Job Submission task, JRA1 Activity (Reengineering of Services) of the OMII-EU project. From jan to july 2009 I have been co-chair of the Production Grid Infrastructures Working Group (PGI-WG) at the Open Grid Forum .

## Publications

(All papers are available online at <http://www.moreno.marzolla.name/publications/>)

## PhD Thesis

[M04d]

M. Marzolla, *Simulation-Based Performance Modeling of UML Software Architectures*, PhD thesis TD-2004-1, Dottorato di Ricerca in Informatica, II ciclo nuova serie, Dipartimento di Informatica, Università Ca' Foscari di Venezia.

## Journal Papers

[AAG+10]

P. Andreetto, S. Andreozi, A. Ghiselli, M. Marzolla, V. Venturi, L. Zangrando, *Standards-Based Job Management in Grid Systems*, Journal of Grid Computing, Volume 8(1), March 2010, pp. 19—45, Springer, ISSN: 1570-7873 (Print) 1572-9814 (Online), DOI 10.1007/s10723-010-9146-z

[A+09]

C. Aiftimiei, P. Andreetto, S. Bertocco, S. Dalla Fina, A. Dorigo, E. Frizziero, A. Gianelle, M. Marzolla, M. Mazzucato, M. Sgaravatto, S. Traldi, L. Zangrando, *Design and Implementation of the gLite CREAM Job Management Service*, Future Generation Computer Systems, Volume 26, issue 4, April 2010, pp. 654—667, Elsevier, ISSN: 0167-739X, DOI 10.1016/j.future.2009.12.006

[R+09]

M. Riedel, E. Laure, Th. Soddemann, L. Field, J. Casey, M. Litmaath, J.Ph.Baud, B. Koblitz, C. Catlett, D. Skow, JP Navarro, C. Zheng, P.M. Papadopoulos, M. Katz, N. Sharma, O. Smirnova, B. Kónya, P. Arzberger, F. Würthwein, A. S. Rana, T. Martin, M. Wan, V. Welch, T. Rimovsky, S. Newhouse, A. Vanni, Y. Tanaka, Y. Tanimura, T. Ikegami, D. Abramson, C. Enticott, G. Jenkins, R. Pordes, N. Sharma, S. Timm, N. Sharma, G. Moont, M. Aggarwal, D. Colling, O. van der Aa, A. Sim, V. Natarajan, A. Shoshani, J. Gu, S. Chen, G. Galang, R. Zappi, L. Magnoni, V. Ciaschini, M. Pace, V. Venturi, M. Marzolla, P. Andreetto, B. Cowles, S. Wang, Y. Saeki, H. Sato, S. Matsuoka, P. Uthayopas, S. Sriprayoosakul, O. Koeroo, M. Viljoen, L. Pearlman, S. Pickles, M. Jones, G. Moloney, J. Lauret, J. Marsteller, P. Sheldon, S. Pathak, S. De Witt, J. Mencék, J. Jensen, M. Hodges, D. Ross, S. Phatanapherom, G. Netzer, A. R. Gregersen, M. Jones, S. Chen, P. Kacsuk, A. Streit, D. Mallmann, F. Wolf, Th. Lippert, *Interoperation of World-Wide Production e-Science Infrastructures*, Concurrency and Computation: Practice and Experience, Volume 21, Issue 8, pages 961—990, John Wiley & Sons, 2009, DOI 10.1002/cpe.1402

[MMO07]

M. Marzolla, M. Mordacchini, S. Orlando, *Peer-to-Peer Systems for Discovering Resources in a Dynamic Grid*, Parallel Computing, Volume 33, Issues 4—5, Large Scale Grids, May 2007, pages 339—358, Elsevier 2007, ISSN 0167-8191, DOI 10.1016/j.parco.2007.02.006

## Proceedings of International Conferences and Workshops

[MM10]

M. Marzolla, R. Mirandola, *Performance-Aware Reconfiguration of Software Systems*, to appear in Proc. 7th European Performance Engineering Workshop (EPEW 2010), september 23—24, 2010, Bertinoro, Italy

[M10]

M. Marzolla, *The qnetworks Toolbox: A Software Package for Queueing Networks Analysis*, K. Al-Begain, D. Fiems, W. Knottenbelt, editors, Proc. 17th International Conference on Analytical and Stochastic Modelling Techniques and Applications (ASMTA '10), june 14—16 2010, Cardiff, UK, K. Al-Begain, D. Fiems, and W. Knottenbelt (Eds.): ASMTA 2010, LNCS 6148, pp. 102—116, Springer, ISBN 978-3-642-13567-5, DOI 10.1007/978-3-642-13568-2\_8

[RMM+10]

M. Riedel, M.S. Memon, A.S. Memon, A. Streit, F. Wolf, Th. Lippert, A. Konstaninov, M. Marzolla, B. Kónya, O. Smirnova, L. Zangrando, J. Watzl, D. Kranzlmüller, *Improvements of Common Open Grid Standards to Increase High Throughput and High Performance Computing Effectiveness on*

*Large-scale Grid and e-Science Infrastructures*, proc. Seventh High-Performance Grid Computing Workshop (HPGC 2010), April 19, 2010, Atlanta, USA, in conjunction with IEEE International Symposium on Parallel & Distributed Processing, Workshops and PhD Forum (IPDPSW), April 19—23, 2010, Atlanta, USA, IEEE Computer Society, ISBN 978-1-4244-6533-0, DOI 10.1109/IPDPSW.2010.5470916

[C+09]

M. Cecchi, F. Capannini, A. Dorigo, A. Ghiselli, F. Giacomini, A. Maraschini, M. Marzolla, S. Monforte, F. Pacini, L. Petronzio, F. Prelz, *The gLite Workload Management System*, in Proc. 4th International Conference on Grid and Pervasive Computing (GPC 2009), Geneva, 4—8 May 2009, Volume 5529 of LNCS, pp. 256—268, ISSN 0302-9743 (print), 1611-3349 (Online)

[AAB+09]

C. Aiftimiei, P. Andreetto, S. Bertocco, S. Dalla Fina, A. Dorigo, E. Frizziero, A. Gianelle, M. Marzolla, M. Mazzucato, M. Sgaravatto, S. Traldi, L. Zangrando, P. Mendez Lorenzo, V. Miccio, *Using CREAM and CEMonitor for job submission and management in the gLite middleware*, Proc 17th International Conference on Computing in High Energy and Nuclear Physics (CHEP '09), 21—27 March 2009 Prague, Czech Republic, Journal of Physics, Conference Series, vol. 219 issue 6, pp. 062001, 2010, ISSN 1742-6588 (Print), 1742-6596 (Online)

[AM09]

S. Andreozzi, M. Marzolla, *A RESTful Approach to the OGSA Basic Execution Service Specification*, Proc Fourth International Conference on Internet and Web Applications and Services (ICIW 2009), May 24—28, 2009, Mestre, Italy, pp. 131—136, ISBN 978-0-7695-3613-2

[RMM+08]

M. Riedel, A.S. Memon, M.S. Memon, D. Mallmann, A. Streit, V. Venturi, P. Andreetto, M. Marzolla, A. Ferraro, A. Ghiselli, F. Hedman, Zeeshan A. Shah, J. Salzemann, A. Da Costa, V. Breton, V. Kasam, M. Hofmann-Apitius, D. Snelling, S. van de Berghe, V. Li, S. Brewer, A. Dunlop, N. De Silva *Improving e-Science with Interoperability of the e-Infrastructures EGEE and DEISA*, Proceedings of the 31st International Convention MIPRO, Conference on Grid and Visualization Systems (GVS), May 2008, Opatija, Croatia, Croatian Society for Information and Communication Technology, Electronics and Microelectronics, ISBN 978-953-233-036-6, pages 225—231.

[AAB+07]

Z. Ali Shah, P. Andreetto, S. van de Berghe, A. Ferraro, F. Hedman, V. Li, M. Marzolla, Shabaz Memon, Shiraz Memon, M. Riedel, D. Snelling, K. Stamou, A. Streit, B. Twedell, V. Venturi, *Open Standards-based Interoperability of Job Submission and Management Interfaces across the Grid Middleware Platforms gLite and UNICORE*, Proceedings of International Interoperability and Interoperation Workshop (IGIIW) 2007 at 3rd IEEE International Conference on e-Science and Grid Computing, Bangalore, India, December, 2007, IEEE Computer Society, ISBN 0-7695-3064-8, pp. 592—599, printed in the USA

[MMR+07]

M.S. Memon, A.S. Memon, M. Riedel, B. Schuller, D. Mallmann, B. Tweddell, A. Streit, S. van den Berghe, D. Snelling, V. Li, M. Marzolla, P. Andreetto, *Enhanced Resource Management Capabilities using Standardized Job Management and Data Access Interfaces within UNICORE Grids*, Proceedings of 3rd Workshop on Scheduling and Resource Management for Parallel and Distributed Systems SRMPDS 2007, ICPADS'07 - The 13th International Conference on Parallel and Distributed Systems Hsinchu, Taiwan, December, 2007, Volume 2, 5—7 December 2007, IEEE Computer Society, ISBN 978-1-4244-1890-9, pp. 1—6, printed in the USA

[MM07]

M. Marzolla, R. Mirandola, *Performance Prediction of Web Service Workflows*, in Overhage, S.; Szyperski, C.A.; Reussner, R.; Stafford, J.A. (Eds.), Proc. Third International Conference on Quality of Software Architectures, QoSA 2007, Medford, MA, USA, July 11—13, 2007, Vol. 4880 of Lecture Notes in Computer Science, 2008, Printed in the USA, ISBN 978-3-540-77617-8, pp. 127—144.

[A+07]

C. Aiftimiei, P. Andretto, S. Bertocco, S. Dalla Fina, S. Da Ronco, A. Dorigo, A. Gianelle, M. Marzolla, M. Mazzucato, M. Sgaravatto, M. Verlato, L. Zangrando, M. Corvo, V. Miccio, A. Sciaba', D. Cesini, D. Dongiovanni and C. Grandi, *Job Submission and Management Through Web Services: the Experience with the CREAM Service*, in Proc. International Conference on Computing in High Energy and Nuclear Physics (CHEP'07) Journal of Physics: Conference Series, Volume 119, Issue 6, (2008), pp. 062004—, ISSN 1742-6596, DOI 10.1088/1742-6596/119/6/062004, IOP Publishing

[A+07-2]

P. Andretto, S. Androzzi, G. Avellino, S. Beco, A. Cavallini, M. Cecchi, V. Ciaschini, A. Dorigo, F. Giacomini, A. Gianelle, U. Grandinetti, A. Guarise, A. Krop, R. Lops, A. Maraschini, V. Martelli, M. Marzolla, M. Mezzadri, E. Molinari, S. Monforte, F. Pacini, M. Pappalardo, A. Parrini, G. Patania, L. Petronzio, R. Piro, M. Porciani, F. Prezl, D. Rebatto, E. Ronchieri, M. Sgaravatto, V. Venturi and L. Zangrando, *The gLite Workload Management System*, Proc. International Conference on Computing in High Energy and Nuclear Physics (CHEP'07) Journal of Physics: Conference Series, Volume 119, Issue 6, (2008), pp. 062007—, ISSN 1742-6596, DOI 10.1088/1742-6596/119/6/062007, IOP Publishing

[BMM06]

S. Balsamo, M. Marzolla, R. Mirandola, *Efficient Performance models in Component-Based Software Engineering*, Proc. 32nd Euromicro Conference on Software Engineering and Advanced Applications (SEAA), Dubrovnik, Coratia, Aug 8—Sep 1, 2006, pp. 64—71, IEEE Computer Society, printed in the USA, ISSN 1089-6503. A preliminary version appeared as Technical Report CS-2006-2, mar 2006, Dipartimento di Informatica Università Ca' Foscari di Venezia.

[MMO06]

M. Marzolla, M. Mordacchini, S. Orlando, *A P2P Resource Discovery System Based on a Forest of Trees*, Proc. 3rd int. Workshop on Grid and Peer-to-Peer Computing Impacts on Large Scale Heterogeneous Distributed Database Systems (GLOBE'06), DEXA Conference, Krakow, Poland, sep 4—8, 2006, pp. 261—265, IEEE Computer Society, printed in the USA, ISSN 1529-4188

[AV+06]

G. Avellino, S. Beco, A. Cavallini, A. Maraschini, F. Pacini, A. Parrini, C. Scarcella, M. Sottilaro, A. Terracina, F. Dvořák, D. Kouřil, A. Konek, I. Matyska, M. Mulač, J. Pospíšil, M. Ruda, Z. Salvat, J. Šitera, J. Škrabal, M. Vocel, S. Monforte, M. Pappalardo, S. Androzzi, M. Cecchi, V. Ciaschini, T. Ferrari, F. Giacomini, R. Lops, E. Ronchieri, V. Venturi, G. Fiorentino, V. Martelli, M. Mezzadri, E. Molinari, F. Prezl, D. Rebatto, P. Andretto, A. S. Borgia, A. Dorigo, A. Gianelle, M. Marzolla, M. Mordacchini, M. Sgaravatto, L. Zangrando, A. Guarise, G. Patania, R. Piro, A. Werbrouck, *Flexible Job Submission Using Web Services: The gLite WMPoxy Experience*, Proc. International Conference on Computing in High Energy and Nuclear Physics (CHEP'06), Sunanda Banerjee (Editor), Mumbai, India Feb 13—17, 2006, Volume II, pp. 831—835, Macmillan, printed in India, ISBN 0230-63017-0.

[A+06]

P. Andretto, S. A. Borgia, A. Dorigo, A. Gianelle, M. Marzolla, M. Mordacchini, M. Sgaravatto, L. Zangrando, F. Dvořák, D. Kouřil, A. Konek, I. Matyska, M. Mulač, J.

Pospíšil, M. Ruda, Z. Salvat, J. Sitera, J. Škrabal, M. Voc&#367;, G. Avellino, S. Beco, A. Cavallini, A. Maraschini, F. Pacini, A. Parrini, C. Scarcella, M. Sottilaro, A. Terracina, S. Monforte, M. Pappalardo, S. Andreozzi, M. Cecchi, V. Ciaschini, T. Ferrari, F. Giacomini, R. Lops, E. Ronchieri, V. Venturi, G. Fiorentino, V. Martelli, M. Mezzadri, E. Molinari, F. Prelz, D. Rebatto, A. Guarise, G. Patania, R. Piro, A. Werbrouck, *CREAM: A simple, Grid-accessible, Job Management System for local Computational Resources*, Proc. International Conference on Computing in High Energy and Nuclear Physics (CHEP'06), Sunanda Banerjee (Editor), Mumbai, India Feb 13—17, 2006, Volume II, pp. 738—741, Macmillan, printed in India, ISBN 0230-63017-0.

[MMO06]

M. Marzolla, M. Mordacchini, S. Orlando, *Tree Vector Indexes: Efficient Range Queries for Dynamic Content on Peer-to-Peer Networks*, Proc. 14th Euromicro Conference on Parallel, Distributed and Network-Based Processing (PDP 2006), Montbéliard-Sochaux, France, Feb 15-17, 2006, pp. 457—464, IEEE Computer Society, printed in the USA, ISBN 0-7695-2513-X. A preliminary version appeared as Tech. Report CS-2005-6, Apr 2005, Dipartimento di Informatica Università Ca' Foscari di Venezia

[M05]

M. Marzolla, *Reliable Distribution of Data using Replicated Web Servers*, Proc. Sixteenth International Workshop on Database and Expert Systems Applications (DEXA): First International Workshop on High Availability of Distributed Systems (HADIS'05), Copenhagen, Aug 22—26, 2005, pp. 305—309, IEEE Press, printed in the USA, ISBN 0-7695-2424-9. A preliminary version appeared as Technical Report CS-2002-5, April 2002, Dipartimento di Informatica, Università Ca' Foscari di Venezia

[MMO05]

M. Marzolla, M. Mordacchini, S. Orlando, *Resource Discovery in a Dynamic Grid Environment*, Proc. Sixteenth International Workshop on Database and Expert Systems Applications (DEXA): 2nd int. Workshop on Grid and Peer-to-Peer Computing Impacts on Large Scale Heterogeneous Distributed Database Systems (GLOBE'05), Copenhagen, Aug. 22—26, 2005, pp. 256—260, IEEE Press, printed in the USA, ISBN 0-7695-2424-9. A preliminary version appeared as Technical Report CS-2005-3, March 2005, Dipartimento di Informatica Università Ca' Foscari di Venezia.

[BM05]

S. Balsamo, M. Marzolla, *Performance Evaluation of UML Software Architectures with Multiclass Queueing Network Models*, Proc. Fifth Int. Workshop on Software and Performance (WOSP'05), Palma de Mallorca, Spain, July 12—14, 2005, pp. 37—42, ACM Press, printed in the USA. ISBN 1-59593-087-6. A preliminary version appeared as Tech. Report CS-2004-13, dec 2004, Dipartimento di Informatica, Università Ca' Foscari di Venezia.

[BMM04]

S. Balsamo, R. Mamprin, M. Marzolla, *Performance Evaluation of Software Architectures with Queueing Network Models*, In Carmen Bobenau, editor, Proc. of the European Simulation and Modeling Conference 2004 (ESMc'04), October 25—27, 2004, UNESCO, Paris, France, pp. 206—213, printed in Belgium, ISBN 90-77381-14-7.

[MB04]

M. Marzolla, S. Balsamo, *UML-PSI: The UML Performance Simulator*, Proc. of the First International Conference on the Quantitative Evaluation of Systems (QEST 2004), Enschede, The Netherlands, September 27—30, 2004, pp. 340—341, IEEE Computer Society, Printed in the USA, ISBN 0-7695-2185-1; a preliminary version appeared as Tech. Report CS-2004-2, apr 2004, Dipartimento di Informatica, Università Ca' Foscari di Venezia

[M04]

M. Marzolla, *libcppsim: a Simula-like, Portable Process-Oriented Simulation Library in C++*, In Graham Horton, editor, Proc. of ESM'04, the 18th European Simulation Multiconference, pages 222—227, Magdeburg, Germany, jun 13—16 2004, SCS Press, Printed in Germany, ISBN 3-936150-35-4; a preliminary version appeared as Tech. Report CS-2004-1, feb 2004, Dipartimento di Informatica, Università Ca' Foscari di Venezia

[BDIM04]

S. Balsamo, A. Di Marco, P. Inverardi, M. Marzolla, *Experimenting different Software Architectures Performance Techniques: A Case Study*, Proc. of the Fourth International Workshop on Software and Performance (WOSP'04), pages 115—119, Redwood Shores, CA, jan 14—16 2004, ACM Press, printed in the USA. ISBN 1-58113-673-0; a preliminary version appeared as Tech. Report TR SAH/46, MIUR Sahara Project, 18 sept 2003.

[BM03-3]

S. Balsamo, M. Marzolla, *Towards Performance Evaluation of Mobile Systems in UML*, In B. di Martino, L. T. Yang, and C. Bobenau, editors, Proc. of the European Simulation and Modelling Conference 2003 (ESMc'03), pages 61—68, Naples, Italy, Oct. 27—29 2003. EUROSIS-ETI. Printed in Belgium. ISBN 90-77381-04-X; a preliminary version appeared as Tech. Report TR SAH/45, MIUR Sahara Project, 30 jul 2003.

[BM03-2]

S. Balsamo, M. Marzolla, *A Simulation-Based Approach to Software Performance Modeling*, In Paola Inverardi, editor, Proc. Joint 9th European Software Engineering Conference (ESEC) & 11th SIGSOFT Symposium on the Foundations of Software Engineering (FSE-11), pages 363—366, Helsinki, FI, Sept. 1—5 2003. ACM Press. Printed in the USA. ISBN 1-58113-743-5; a preliminary version appeared as Tech. Report TR SAH/44, MIUR Sahara Project, 26 mar 2003.

[BM03]

S. Balsamo, M. Marzolla, *Simulation Modeling of UML Software Architectures*, In D. Al-Dabass, editor, Proc. of ESM'03, the 17th European Simulation Multiconference, pages 562—567, Nottingham, UK, June 9—11 2003. SCS European Publishing House. Printed in Germany. ISBN 3-936150-25-8; a preliminary version appeared as Tech. Report TR SAH/43, MIUR Sahara Project, 26 feb 2003. Best Paper Award of the “Complex Systems Modeling” track.

[MM03]

M. Marzolla, V. Melloni, *A Monitoring System for the BaBar INFN Computing Cluster*, Proc. 2003 International Conference on Computing in High Energy and Nuclear Physics (CHEP'03), La Jolla, California March 24—28, 2003, Electronic Proceedings (distributed on DVD), SLAC-R-636, eConf C0303241

[M03]

M. Marzolla, *A Performance Monitoring System For Large Computing Clusters*, In Andrea Clematis, editor, Proc. of the 11th Euromicro Conference on Parallel, Distributed and Network-Based Processing (PDP'03), pages 393-400, Genova, Italy, feb 5—7 2003, IEEE Computing Society Press. Printed in the USA. ISBN 0-7695-1875-3

[M01]

M. Marzolla, *Distributed Simulation of Large Computer Systems*, In H. S. Chen, editor, Proc. of CHEP 2001, International Conference on Computing in High Energy and Nuclear Physics, pages 477—480, Beijing, P. R. China, Sep 3—7 2001. Science Press, Printed in Beijing. ISBN 1-880132-77-X

[M98]

M. Marzolla, *Maintaining Dynamic Graph Properties Deterministically*, In P. Degano, U. Vaccaro and G. Pirillo, editors, Proc. Sixth Italian Conference on Theoretical Computer Science (ICTCS'98), pages 102—113, Prato, Italy, nov 9—11 1998, World Scientific Publishing, Printed in Singapore. ISBN 981-02-3655-7

## Technical Reports

[UBLCS-2010-11]

M. Marzolla, R. Mirandola, *Performance-Aware Reconfiguration of Software Systems*, Technical Report UBLCS-2010-11, Department of Computer Science, University of Bologna, May 2010

[UBLCS-2010-05]

M. Marzolla, R. Mirandola, *QoS Analysis for Web Service Applications: a Survey of Performance-oriented Approaches from an Architectural Viewpoint*, Technical Report UBLCS-2010-05, Department of Computer Science, University of Bologna, February 2010

[UBLCS-2010-04]

M. Marzolla, *The `gnetworks` Toolbox: A Software Package for Queueing Networks Analysis*, Technical Report UBLCS-2010-04, Department of Computer Science, University of Bologna, February 2010

[UBLCS-2010-02]

M. Marzolla, *Optimized Training of Support Vector Machines on the Cell Processor*, Technical Report UBLCS-2010-02, Department of Computer Science, University of Bologna, February 2010

[INFN/TC\_09/3]

C. Aiftimiei, P. Andreetto, S. Bertocco, S. Dalla Fina, A. Dorigo, E. Frizziero, A. Gianelle, M. Marzolla, M. Mazzucato, M. Sgaravatto, S. Traldi, L. Zangrando, *Design and Implementation of the `gLite CREAM Job Management Service`*, INFN Technical Note INFN/TC\_09/3, may 5, 2009.

[INFN/TC\_08/6]

P. Andreetto, S. Andreatto, A. Ghiselli, M. Marzolla, V. Venturi, L. Zangrando, *Standards-Based Job Management in Grid Systems*, INFN Technical Note INFN/TC\_08/6, october 9, 2008.

[INFN/TC\_08/4]

S. Andreatto, M. Marzolla, *A RESTful Approach to the OGSA Basic Execution Service Specification*, INFN Technical Note INFN/TC\_08/4, september 22, 2008.

[tr-BMG03]

S. Balsamo, M. Grosso, M. Marzolla, *Towards Simulation-Based Performance Modeling of UML specifications*, Tech. Report CS-2003-2, jan 2003, Dipartimento di Informatica, Università Ca' Foscari di Venezia

## Other Technical Papers

[AMMZ09]

S. Andreatto, L. Magnoni, M. Marzolla, R. Zappi, *Design of `Gluon`: an Atom-oriented approach for publishing `GLUE 2.0` information*, (Poster) Proc. CHEP'09, Prague, Czech Republic, 21-27 March 2009

[OMII08-2]

M. Marzolla et al., *OMII-Europe supports BES plus the required extensions*, OMII-EU project Milestone M:JRA1.10, apr 2008, the OMII-Europe project

[OMII08]

M. Marzolla et al., *The second yearly report on the job submission and job monitoring task*, OMII-EU project deliverable D:JRA1.10, apr 2008, the OMII-Europe project

[OMII07-3]

M. Marzolla et al., *Implementation of JSDL into OMII-Europe middleware together with the identified extensions*, OMII-EU project Milestone M:JRA1.9, nov 2007, the OMII-Europe project

[OMII07-2]

M. Marzolla et al., *Evaluation of OGSA-BES with respect to its adoption in the middleware of the OMII-Europe partners*, OMII-EU project Milestone M:JRA1.17, apr 2007, the OMII-Europe project

[OMII07]

M. Marzolla et al., *The first yearly report on the job submission and job monitoring task*, OMII-EU project deliverable D:JRA1.9, apr 2007, the OMII-Europe project

[OMII06]

M. Marzolla et al., *Definition of JSDL extensions*, OMII-EU project Milestone M:JRA1.7, oct 2006, the OMII-Europe project

[M+06]

E. Molinari et al., *A local batch system abstraction layer for global use* (Poster) Proc. 2006 International Conference on Computing in High Energy and Nuclear Physics (CHEP'06), Mumbai, India Feb 13—17, 2006

[ACD+03]

D. Andreotti, A. Crescente, A. Dorigo, F. Galeazzi, M. Marzolla, M. Morandin, F. Safai Tehrani, R. Stroili, G. Tiozzo, G. Vedovato, *A Facility for large scale reprocessing of BaBar raw data*, (Poster) Proc. 2003 International Conference on Computing in High Energy and Nuclear Physics (CHEP'03), La Jolla, California, March 24—28, 2003, Electronic Proceedings (distributed on DVD), SLAC-R-636, eConf C0303241

[BA01]

BaBar Collaboration, *Measurement of CP-Violating Asymmetries in B0 Decays to CP Eigenstates*, Physical Review Letters, 86(12), pp. 2515—2522, march 10 2001

[BA01-2]

BaBar Collaboration, *The BaBar Detector*, Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment volume 479, Issue 1, 21 feb 2002, pp. 1—116

## Invited Seminars

april 28, 2010

*The gnetworks Toolbox: a Software Package for Queueing Networks Analysis*, presented at the Dipartimento di Informatica, Università Ca' Foscari di Venezia, Italy

may 10, 2002

*(Towards) A Scalable Monitoring System for Large Computing Clusters*, presented at the National Research Council (CNR) Pisa, Italy

# Teaching Activities

## Courses taught

### Academic Year 2009/2010

- Algorithms and Data Structures (*Algoritmi e Strutture Dati*), Corso di laurea in Informatica per il Management, Università di Bologna. The courses web page (in italian) is available at <http://www.moreno.marzolla.name/teaching/ASD2009/>.
- I gave five lectures (2 hours each) for the Complex Systems Course, Prof. Ozalp Babaoglu, Corso di laurea magistrale in Informatica, Università di Bologna. The lectures are available at <http://www.moreno.marzolla.name/teaching/CS2010/>.

### Academic Year 2007/2008

- I gave three seminars (3 hours each) to Computer Science and Mathematics PhD students, Università di Ferrara. Topics were: *Object-Oriented Programming and Design Patterns*, *Introduction to Queueing Networks*, and *Introduction to Discrete-Event Simulation*. The seminars web page is available at <http://www.moreno.marzolla.name/teaching/SeminariFE2008/>.

### Academic Year 2005/2006

- Professor on contract for the Web Technologies course, CS (Computer Science) degree, Università di Padova. My duties included selecting the topics of the course, preparing the material for students, 42 hours of frontal lectures, preparing and grading the final exams. The course web page is still available at <http://www.moreno.marzolla.name/teaching/TecnologieWeb2006/>.
- Professor on contract for the Introduction to Computer Science course, Chemistry degree, Università di Padova. My duties included selecting the topics of the course, preparing the material for students, 48 hours of frontal lectures, preparing and grading the final exams. The course web page is still available at <http://www.moreno.marzolla.name/teaching/FondamentiInf2005/>.
- I gave seminars (6 hours) on Systems Performance Evaluation for Computer Science PhD students, Università di Ferrara.

### Academic Year 2004/2005

- Professor on contract for the Software Engineering course, CS degree, Università di Ferrara. My duties included selecting the topics of the course, preparing the material for students, 56 hours of frontal lectures, preparing and grading the final exams. The course web page is still available at <http://www.moreno.marzolla.name/teaching/IngSoftware2005/index-unife.php>.
- Professor on contract for the Software Engineering course, CS degree, Università Ca' Foscari di Venezia. My duties included selecting the topics of the course, preparing the material for students, 48 hours of frontal lectures, preparing and grading the final exams. The course web page is still available at <http://www.moreno.marzolla.name/teaching/IngSoftware2005/index-unive.php>.
- Professor on contract for the Web Technologies course, CS degree, Università di Ferrara. My duties

included selecting the topics of the course, preparing the material for students, 56 hours of frontal lectures, preparing and grading the final exams. The course web page is still available at <http://www.moreno.marzolla.name/teaching/TecnologieWeb2005/>.

- Teaching Assistant (25 hours) for the course of Programming I (prof. Gilberto Filè), CS degree, Università di Padova.
- I gave lectures (10 hours) for the Distributed Systems course (prof. Simonetta Balsamo), CS degree, Università Ca' Foscari di Venezia. The course web page is still available at <http://www.moreno.marzolla.name/teaching/SistemiDistribuiti2005/>.

## **Academic Year 2003/04**

- Professor on contract for the Software Engineering course, CS degree, Università di Ferrara. My duties included selecting the topics of the course, preparing the material for students, 56 hours of frontal lectures, preparing and grading the final exams.
- Teaching Assistant (25 hours) for the course of Programming I (prof. Gilberto Filè), CS degree, Università di Padova. My duties included preparing the material for students and grading their homeworks.
- Teacher for the E-Commerce module for the IFTS professional training course “Tecnico Superiore per lo sviluppo del commercio elettronico” (Legnago, VR, Italy). My duties included course topics selection, preparation of the material for students, 140 hours of frontal lectures and practical exercises and preparation and grading of the final exams.
- I gave lectures (10 hours) for the Distributed Systems course (prof. Simonetta Balsamo), CS degree, Università Ca' Foscari di Venezia.

## **Academic Year 2002/03**

- I gave lectures (10 hours) for the Distributed Systems course (prof. Simonetta Balsamo), CS degree, Università Ca' Foscari di Venezia.
- Professor on contract for the Software Engineering course, CS degree, Università di Ferrara. My duties included selecting the topics of the course, preparing the material for students, 56 hours of lectures, preparing and grading the final exams.

## **Academic Year 2001/02**

- I gave lectures (10 hours) for the Distributed Systems course (prof. Simonetta Balsamo), CS degree, Università Ca' Foscari di Venezia.

## **Academic Year 2000/01**

- I gave one lecture (2 hours) for the Operating Systems course (prof. Augusto Celentano), CS degree, Università Ca' Foscari di Venezia;
- I gave lectures (12 hours) for the Distributed Systems course (prof. Simonetta Balsamo), CS degree, Università Ca' Foscari di Venezia.

## Theses supervised as advisor

- Francesco Varanelli, *Sistemi di Pagamento Elettronico* (Electronic Payment Systems), laurea triennale in Scienze di Internet, Academic Year 2009/10, Università di Bologna.
- Lamberto Lodi, *Esportazione di funzionalità da una applicazione gestionale tramite Web Services*, (Exporting functionalities from management applications using Web Services), laurea triennale in Informatica, Academic Year 2004/05, Università di Ferrara.
- Cristina Sgobbi, *Realizzazione di nuove rappresentazioni multimediali tridimensionali tramite panoramiche di oggetti e integrazioni con oggetti VRML*, (Implementation of new three-dimensional multimedial representations using object panorama and integration with VRML), laurea triennale in Informatica, Academic Year 2004/05, Università di Ferrara.
- Luca Massarenti, *Progettazione e analisi di un metodo affidabile di memorizzazione dati*, (Design and analysis of a reliable data storage system), laurea triennale in Informatica, Academic Year 2003/2004, Università di Ferrara.
- Alessandro Moreschi, *Una applicazione per la spettroscopia NIR*, (An Application for NIR spectrometry) laurea triennale in Informatica, Academic Year 2003/2004, Università di Ferrara.
- Lisa Pelati, *Sistemi di pagamento mobili* (Mobile Systems Payment), laurea triennale in Informatica, Academic Year 2003/04, Università di Ferrara.
- Daniele Bizzarri, *Una alternativa agile alle tradizionali metodologie di sviluppo del software: eXtreme Programming* (An agile alternative to traditional software development methodologies: eXtreme Programming), laurea triennale in Informatica, Academic Year 2003/04, Università di Ferrara.

## Theses supervised as co-advisor

- Carlo Gnesotto, *Realizzazione di uno strumento per la gestione di corsi on-line* (A tool for on-line courses management), laurea triennale in Informatica, Academic Year 2004/05, Università Ca' Foscari di Venezia, Advisor dott. Ombretta Gaggi.
- Dario Savian, *Generazione di modelli a Rete di Code multiclasse da specifiche UML* (Generation of Multiclass Queueing Network models from UML Specifications), laurea triennale in Informatica, Academic Year 2004/05, Università Ca' Foscari di Venezia. Advisor prof. Simonetta Balsamo.
- Marco Varagnolo, *Monitoraggio e gestione di reti di calcolatori* (Monitoring and Management of Computer Networks), laurea in scienze dell'informazione, Academic Year 2001/02, Università Ca' Foscari di Venezia. Advisor: prof. Simonetta Balsamo.
- Valerio Melloni, *Sviluppo e implementazione di un sistema di monitoraggio di una farm di calcolo basato su SNMP e XML* (Design and Implementation of a monitoring system for a computing farm based on SNMP and XML), laurea triennale in Informatica, Academic Year 2001/02, Università di Ferrara. Advisor: prof. Eleonora Luppi.
- Marco Cappellini, *Sviluppo e implementazione di una interfaccia WEB per un sistema di monitoraggio scalabile di cluster di grandi dimensioni* (Design and Implementation of a WEB interface for a scalable monitoring system for large clusters), laurea triennale in Informatica, Academic Year 2001/02, Università di Ferrara. Advisor: prof. Eleonora Luppi.
- Mattia Grosso, *Analisi quantitativa tramite simulazione di architetture software in UML* (Quantitative Analysis via Simulation of UML Software Architectures), laurea triennale in Informatica, Academic Year 2001/02, Università Ca' Foscari di Venezia. Advisor: prof. Simonetta

Balsamo.

## Software Developed

This section describes some of the software I have developed

### `LIBSVMCBE`

`LIBSVMCBE` is an optimized version of `LIBSVM` for efficient training Support Vector Machines on the Cell Broadband Engine (CBE). `LIBSVMCBE` has been described in [UBLCS-2010-02].

### `qnetworks`: a Queueing Networks Analysis Package for GNU octave

`qnetworks` is a GNU Octave package which implements some Queueing Network analysis algorithms. This software has been described in [M10].

### Patch contributed to the `gphoto` project

I contributed a patch to the `gphoto` library for better supporting the Canon A40 digital camera. In particular, my patch improved the remote capture support capabilities of `gphoto2` for this particular camera. My contribution has been included into the main development branch of `gphoto2`.

### `libcppsim` and `UML-PSI`

During my PhD thesis I developed `libcppsim` and `UML-PSI`, `libcppsim` is a process-oriented simulation library written in C++; `UML-PSI` (the UML Performance SIMulator) is a software package for simulation modeling of software architectures described as annotated UML diagrams. Both softwares, although no longer maintained, are still available as open source software under the GNU General Public License. These packages have been described in [M04] [MB04] [M04d].

### `perfmc`

While I worked at INFN Padova for the BaBar collaboration I wrote `perfmc`, a monitoring system for compute farms. `perfmc` uses the Simple Network Management Protocol (SNMP) to query a large number of heterogeneous hosts (including other SNMP-capable appliances, such as routers, tape libraries and so on). `perfmc` has been used at INFN Padova for many years to monitor the BaBar reprocessing farm, which includes more than 300 CPUs. While never publicly released, this software has been described in [M03].

\$Revision: 107 \$

Bologna, July 26, 2010

Moreno Marzolla