ascens

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# ASCENS

## Autonomic Service-Component Ensembles

# D9.3: Progress Report on Dissemination, Collaboration and Exploitation

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SEVENTH FRAMEWORK PROGRAMME

## Executive Summary

This report describes the efforts performed in the first to third reporting period of the ASCENS project to achieve the dissemination, collaboration and exploitation objectives of month 1-36. This is therefore a cumulative report. The objectives are defined in the Annex I "Description of Work" of the project contract while the dissemination and exploitation strategy is described in deliverable D9.1.a.

The report includes a section describing the project identity and three sections dedicated each to one of the main topics: dissemination, collaboration and exploitation. The second section describes the activities completed to disseminate the knowledge of the project, the third section gives an overview on collaboration platforms and activities, and the fourth section addresses exploitable knowledge that is produced within the scope of the ASCENS project. Finally, a table of measurable results is presented as summary.

During the first three years of the project ASCENS members produced 192 publications. The list of accepted and submitted publications includes 32 articles for journals, 148 conference and workshop papers, 5 book contributions, 6 technical reports and 1 short overview article published in the Awareness Magazine. The number of joint publications in which two or more partners or an associated researcher and a partner were involved adds up to 71 (37%). In addition, 104 presentations not directly related to a publication were held during these reporting periods. Project members organized 47 conferences and workshops, participated in the organization of 6 summer schools, and taught ASCENS related topics in 39 courses. The collaboration activities with other projects comprise the participation in the AWARENESS coordination action (CA) meetings, the contact to and joint work with associated researchers, bilateral meetings with other projects and teaching at the AWARENESS Virtual Lecture Series (AVLS) and at the AWASS Summer Schools 2012 and 2013.

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# 1 Project Identity

ASCENS presented its project identity (PI) at the kick-off meeting in Munich, Germany, on October 10-11, 2010. Since then it is used in the website, presentations and reports, i.e. whenever projects results are presented. We believe that a strong PI helps to reinforce the image of the project and supports the dissemination activities. The PI is implemented by

- a set of colors,
- a logo (see Figure 1),
- templates for presentations (LaTeX beamer and PowerPoint format), and
- templates for deliverables, progress reports and technical reports (LaTeX and Word format).

Figure 1: ASCENS logo

In particular, the templates for deliverables and reports were made more general during the second year of the project. In the third year, quality of logos were improved, mainly for their use in the flyer and posters designed for the exhibition ICT 2013 in Vilnius.

# 2 Dissemination of Project Results

To attain the goal to promote and publish the results of the ASCENS project to a wide scientific and industrial audience, in the first three years the research results were disseminated through scientific publications, invited speakers' presentations, tutorials and lectures. Another dissemination activity consisted in the organization of events such as conferences, workshops and symposia on topics related to the ASCENS research area. The general public is informed about the project through the website and a blog. The consortium also started with the preparations for the exhibition at the ICT 2013 in the third year. In the following sections the different dissemination activities and results are presented in detail.

## 2.1 ASCENS Website

The ASCENS website (`http://www.ascens-ist.eu`) was set-up by LMU before the start of the project by October 1st, 2010 and was continuously updated since then. The website contains general information as well as all non-confidential results, i.e. papers, presentations, course material, software, etc. It allows easy access to this information for researchers, interested companies, and institutions. It includes objectives of the project, a page for each partner of the project describing the role of the partner and the researchers involved in the project, some results achieved so far, the list of publications and deliverables. The list of associated researchers is also published on the project website.

The ASCENS website (shown in Figure 2) is built using a content management application (open source Joomla of Apache) and imports the publications from the Publication Management Interface application (PMI) developed by LMU. For more details on the PMI see Section 2.3.

Figure 2: ASCENS website

We use an ASCENS blog (`http://blog.ascens-ist.eu/`) to communicate the goals and the progress of the ASCENS project to the public in a way that can be understood by people who are interested in engineering ensembles, but not experts in this field (see Figure 3). Therefore, we address the non-technical public describing easy understandable scenarios to illustrate how methods, techniques and languages developed within the scope of ASCENS will be applied in the development of autonomic service-component ensembles. Over the course of the first three years of the project we have published 21 blog articles. covering not only questions related to the main topics of our project, but also first results.

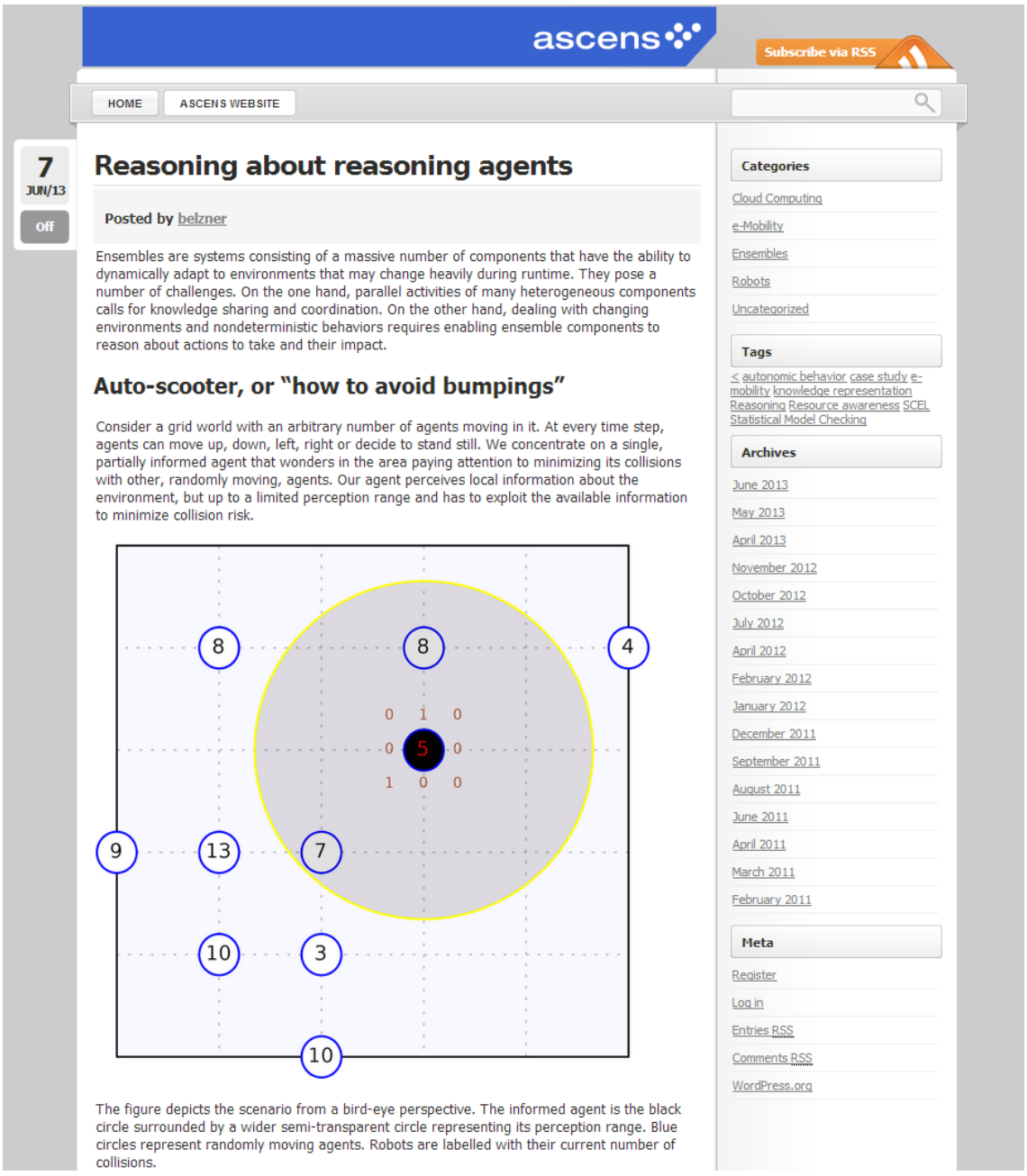



Figure 3: ASCENS blog

Regarding cross references, on the one hand the ASCENS website provides links to many related projects grouped in categories, such as self-awareness, global computing, and swarm robotics. On the other hand, several websites of organizations, universities, institutes and other projects as well as the homepages of many partner members include links to the ASCENS website, for example:

- Homepages of universities, organisations and companies
  - European Commision, ICT Research in FP7, FET Proactive
    http://cordis.europa.eu/fp7/ict/fet-proactive/aware_en.html
  - Ludwig-Maximilians-Universität München (LMU), Institute for Informatics, Programming and Software Engineering Unit
    http://www.pst.ifi.lmu.de/Research/current-projects
  - Ludwig-Maximilians-Universität München (LMU), Institute for Informatics, Communication Systems and System Programming Unit
    http://www.nm.ifi.lmu.de/projects/ASCENS/
  - Ludwig-Maximilians-Universität München (LMU), European Projects
    http://www.uni-muenchen.de/forschung/service/forschungsfoerderung/eu_programme/7frp/koord_7frp/index.html
  - Consiglio Nazionale delle Ricerche, Istituto di Scienza e Tecnologie dell'Informazione "A. Faedo (ISTI), Formal Methods and Tools Laboratory
    http://www.isti.cnr.it/research/unit.php?unit=FMT&section=projects
  - IMT Institute for advanced studies Lucca, System Modelling and Analysis research unit
    https://sysma.lab.imtlucca.it/
  - IRIDIA-CoDE laboratory, Université Libre de Bruxelles
    http://code.ulb.ac.be/iridia.home.php
  - Lero – the Irish Software Engineering Research Centre, University of Limerick, ASCENS Project Web Page
    http://www.lero.ie/project/ascens
  - Università di Firenze, Dipartimento di Sistemi e Informatica, Concurrency and Mobility Group
    http://gdn.dsi.unifi.it/cmg/index.php/projects/
  - Fraunhofer FOKUS
    http://www.fokus.fraunhofer.de/en/quest/projekte/laufende_projekte/ascens
  - Mobysa Association
    https://sites.google.com/site/mobsya/activites?pli=1
  - Verimag website
    http://www-verimag.imag.fr/ASCENS.html
  - EPFL MOBOTS, self-assembling robots page
    http://mobots.epfl.ch/self-assembling-robots.html
  - Department of Distributed and Dependable Systems, Charles University in Prague, project page
    http://d3s.mff.cuni.cz/projects/

  - Zimory
    http://www.zimory.com/partners/ascens-european-commission/

- Homepages of other projects
  - AWARENESS Coordination Action
    http://www.aware-project.eu/
  - SAPERE project
    http://www.sapere-project.eu
  - CoCoRo Collective Cognitive Robots Project
    http://cocoro.uni-graz.at/
  - ARGoS robot simulator website
    http://iridia.ulb.ac.be/argos/argos_in_use.php
  - quanticol project
    http://blog.inf.ed.ac.uk/quanticol/links/

- Homepages of ASCENS members
  - Homepages of Martin Wirsing, Mirco Tribastone, Nora Koch, Annabelle Klarl, Philip Mayer, Lenz Belzner (LMU)
    http://www.pst.ifi.lmu.de/people/staff/
  - Homepages of Diego Latella and Mieke Massink (ISTI)
    http://www.isti.cnr.it/about/people.php
  - Homepages of IMT members
    https://sysma.lab.imtlucca.it/?page_id=4
  - Homepages of Roberto Bruni, Andrea Corradini, Gianluigi Ferrari, Fabio Gadducci, Ugo Montanari, Matteo Sammartino (UNIPI)
    http://compass2.di.unipi.it/amministrazione/persone/index.asp
  - Homepages of Marco Dorigo, Mauro Birattari, Carlo Pinciroli (ULB)
    http://iridia.ulb.ac.be/~mdorigo/HomePageDorigo/projects.php
    http://iridia.ulb.ac.be/~mbiro/projects.html
    http://iridia.ulb.ac.be/~cpinciroli/projects.php
  - Homepage of Franco Zambonelli (UNIMORE)
    http://www.agentgroup.unimo.it/Zambonelli
  - Homepage of Emil Vassev (Lero at UL)
    http://www.vassev.com/
  - Homepages of Michele Boreale, Michele Loreti, Rosario Pugliese (UDF)
    http://www.dsi.unifi.it/~boreale/
    http://www.dsi.unifi.it/~loreti/
    http://www.dsi.unifi.it/~pugliese/,
  - Homepage of Jacques Combaz (Verimag)
    http://www-verimag.imag.fr/~jcombaz/
  - Homepages of Jan Kofron, Petr Hnetynka (CUNI)
    http://d3s.mff.cuni.cz/~kofron/
    http://d3s.mff.cuni.cz/~hnetynka/index.cgi/index/research

## 2.2 Press Releases

A press release was posted at the website of the project coordinator (LMU) in order to provide general information on the start of the project to a wide audience. In addition, announcements were also done by two Italian local newspapers and the Università di Modena e Reggio Emilia. These press releases and the corresponding links are listed below.

- LMU site (October 11,2010)
  `http://www.en.uni-muenchen.de/news/newsarchiv/2010/2010-ascens-wirsing.html`
- UNIMORE site (November 15, 2010)
  http://www.magazine.unimore.it/index.php?option=com_content&view=article&id=526 finanziamenti-europei-per-la-ricerca-unimore&catid=1:ricerca&Itemid=346
- Modena 2000 newspaper (November 21, 2010)
  `http://www.ascens-ist.eu/images/ascens/modena2000.pdf`
- Giornale di Reggio Emilia newspaper (November 22, 2010)
  `http://www.ascens-ist.eu/images/ascens/modena2000.pdf`

An overview article on the ASCENS project was written during the first reporting year and published by the AWARENESS magazine in 2012 (see list of publications in Sec. 2.3).

## 2.3 ASCENS Publications

During the first three reporting periods of the ASCENS project 192 publications were produced, of which 50 were published in the first reporting period and 80 in the second period. The list of publications includes articles for journals (32), conference and workshop papers (148), book contributions (5), technical reports (6) and 1 overview article. All publications with exception of the two last categories were peer reviewed and were submitted to the best scientific journals like *Theoretical Computer Science*, *Journal of Grid Computing*, and *ACM Transactions on Autonomous and Adaptive Systems*, major international conferences, ranging from the more foundation-oriented like FACS, FASE, FORTE and NASA Formal Methods, to those that address more methodological and application-oriented aspects of software engineering, such as DEXA and IROS. All of the publications listed below have been already published or accepted for publication.

In this three reporting periods 71 joint publications were published, i.e. a 37% of the total. Joint publications are those in which at least two partners (59) or at least a partner and an associated researcher (12) were involved. In the following we include both lists, of joint and non-joint publications. Almost all partners participated in joint publications. In the last part of the section we give some details on the Publication Management System used in the ASCENS project.

done

### 2.3.1 Joint Publications

[ABN11] Lucia Acciai, Michele Boreale, and Rocco De Nicola. Linear-Time and May-Testing in a Probabilistic Reactive Setting. In Roberto Bruni and Juergen Dingel, editors, *Formal Techniques for Distributed Systems*, volume 6722 of *LNCS*, pages 29–43. Springer Berlin / Heidelberg, June 2011.

[AHZ13] Dhaminda Abeywickrama, Nicklas Hoch, and Franco Zambonelli. SimSOTA: Engineering and Simulating Feedback Loops for Self-adaptive Systems. In *Sixth International C* Conference on Computer Science & Software Engineering*, pages 67–76, Porto (P), July 2013. ACM, ACM.

[AZH12] Dhaminda Abeywickrama, Franco Zambonelli, and Nicklas Hoch. Towards Simulating Architectural Patterns for Self-Aware and Self-Adaptive Systems. In *2nd SASO Workshop on Awareness in Autonomic Systems*, Lyon (F), September 2012. IEEE CS Press.

[BBGM10] Paolo Baldan, Filippo Bonchi, Fabio Gadducci, and Giacoma Valentina Monreale. Concurrency Can't Be Observed, Asynchronously. In Kazunori Ueda, editor, *Programming Languages and Systems - 8th Asian Symposium, APLAS 2010, Shanghai, China, November 28 - December 1, 2010. Proceedings*, volume 6461 of *Lecture Notes in Computer Science*, pages 424–438. Springer, 2010.

[BC13] Michele Boreale and Alessandro Celestini. Asymptotic Risk Analysis for Trust and Reputation Systems. In Peter van Emde Boas et al., editor, *SOFSEM 2013, Theory and Practice of Computer Science*, volume 7741 of *LNCS*, pages 169–181. Springer Berlin Heidelberg, 2013.

[BCDCM11] Maria Grazia Buscemi, Mario Coppo, Mariangiola Dezani-Ciancaglini, and Ugo Montanari. Constraints for Service Contracts. In Roberto Bruni and Vladimiro Sassone, editors, *TGC 2011*, volume 7173 of *Lecture Notes in Computer Science*, pages 104–120. Springer, 2011.

[BCG+12a] Roberto Bruni, Andrea Corradini, Fabio Gadducci, Alberto Lluch Lafuente, and Andrea Vandin. Modelling and Analyzing Adaptive Self-assembly Strategies with Maude. In *Proceedings of the 9th International Workshop on Rewriting Logicand its Applications (WRLA 2012)*, volume 7571 of *LNCS*, pages 18–138. Springer, 2012.

[BCG+12b] Roberto Bruni, Andrea Corradini, Fabio Gadducci, Alberto Lluch-Lafuente, and Andrea Vandin. A Conceptual Framework for Adaptation. In Juan de Lara and Andrea Zisman, editors, *Proceedings of the 15th International Conference on Fundamental Approachesto Software Engineering, FASE 2012*, volume 7212 of *Lecture Notes in Computer Science*, pages 240–254. Springer, 2012.

[BCG+13] Roberto Bruni, Andrea Corradini, Fabio Gadducci, Alberto Lluch-Lafuente, and Andrea Vandin. Adaptable Transition Systems. In Narciso Martí-Oliet and Miguel Palomino, editors, *Recent Trends in Algebraic Development Techniques, 21st International Workshop, WADT 2012*, volume 7841 of *Lecture Notes in Computer Science*, pages 95–110. Springer, 2013.

[BDFZ09] Massimo Bartoletti, Pierpaolo Degano, Gian Luigi Ferrari, and Roberto Zunino. Model Checking Usage Policies. *Mathematical Structures in Computer Science*, To appear, 2009.

[BFK12] Roberto Bruni, Carla Ferreira, and Anne Kersten Kauer. First-Order Dynamic Logic for Compensable Processes. In *COORDINATION 2012*, volume 7274 of *LNCS*, pages 104–121. Springer, 2012.

[BGL+11] Saddek Bensalem, Andreas Griesmayer, Axel Legay, Thanh-Hung Nguyen, Joseph Sifakis, and Rongjie Yan. D-Finder 2: Towards Efficient Correctness of Incremental Design. In Mihaela Gheorghiu Bobaru, Klaus Havelund, Gerard J. Holzmann, and Rajeev Joshi, editors, *NASA Formal Methods - Third International Symposium, NFM 2011, Pasadena, CA, USA, April 18-20, 2011. Proceedings*, volume 6617 of *Lecture Notes in Computer Science*, pages 453–458. Springer, 2011.

[BGM11] Filippo Bonchi, Fabio Gadducci, and Giacoma Valentina Monreale. Towards a General Theory of Barbs, Contexts and Labels. In Hongseok Yang, editor, *Proceedings of the 9th Asian Symposium on Programming Languages and Systems (APLAS 2011)*, volume 7078 of *Lecture Notes in Computer Science*, pages 289–304. Springer, 2011.

[BK12] Roberto Bruni and Anne Kersten Kauer. LTS Semantics for Compensation-based Processes. In *TGC 2012*, volume 8191 of *LNCS*, pages 112–128. Springer, 2012.

[BKK11] Marianne Busch, Alexander Knapp, and Nora Koch. Modeling Secure Navigation in Web Information Systems. In Janis Grabis and Marite Kirikova, editors, *10th International Conference on Business Perspectives in Informatics Research*, LNBIP, pages 239–253. Springer Verlag, 2011.

[BKM+12] Marianne Busch, Nora Koch, Massimiliano Masi, Rosario Pugliese, and Francesco Tiezzi. Towards Model-Driven Development of Access Control Policies for Web Applications. In *Workshops MoDELS 2012*, page 6. ACM, September 2012. to appear.

[BL11] Roberto Bruni and Alberto Lluch-Lafuente. Evaluating the Performance of Model Transformation Styles in Maude. In *Proceedings of FACS 2011, 8th International Workshop on Formal Aspectsof Component Software*, volume 7253 of *LNCS*, pages 79–96. Springer, 2011.

[BLLM13] Roberto Bruni, Alberto Lluch-Lafuente, and Ugo Montanari. Constraint Design Rewriting. *Science of Computer Programming*, 2013. To appear.

[BLM11] Roberto Bruni, Alberto Lluch Lafuente, and Ugo Montanari. On Structured Model-Driven Transformations. *International Journal of Software and Informatics*, 5(1-2):185–206, 2011.

[BM11] Filippo Bonchi and Ugo Montanari. Symbolic and Asynchronous Semantics via Normalized Coalgebras. *Logical Methods in Computer Science*, 7(2), 2011.

[BM12] Maria Grazia Buscemi and Ugo Montanari. A Game-Theoretic Analysis of Grid Job Scheduling. *Journal of Grid Computing*, 10(3):501–519, 2012.

[BMM11] Roberto Bruni, Hernán Melgratti, and Ugo Montanari. A Connector Algebra for P/T Nets Interactions. In J.-P. Katoen and B. Koenig, editors, *Proceedings of CONCUR 2011, 22nd International Conference on ConcurrencyTheory*, volume 6901 of *LNCS*, pages 312–326. Springer, 2011.

[BMM12] Roberto Bruni, Hernán Melgratti, and Ugo Montanari. Connector Algebras, Petri Nets, and BIP. In *PSI 2011*, volume 7162 of *LNCS*, pages 19–38. Springer, 2012.

[BMM13a] Roberto Bruni, Hernán Melgratti, and Ugo Montanari. A Survey on basic Connectors and Buffers. In *FMCO 2011*, volume 7542 of *LNCS*, pages 49–68. Springer, 2013.

[BMM13b] Roberto Bruni, Hernán Melgratti, and Ugo Montanari. Behaviour, Interaction and Dynamics. In Shusaku Iida, José Meseguer, and Kazuhiro Ogata, editors, *Specification, Algebra, and Software*, LNCS. Springer, 2013. To appear.

[BMMS13] Roberto Bruni, Hernán Melgratti, Ugo Montanari, and Pawel Sobocinski. Connector algebras for C/E and P/T nets' interactions. *Logical Methods in Computer Science*, 9(3:16):1–65, 2013.

[BNG+13] Tomáš Bureš, Rocco De Nicola, Ilias Gerostathopoulos, Nicklas Hoch, Michal Kit, Nora Koch, Giacoma Valentina Monreale, Ugo Montanari, Rosario Pugliese, Nikola Serbedzija, Martin Wirsing, and Franco Zambonelli. A Life Cycle for the Development of Autonomic Systems: The e-Mobility Showcase. In *Proceedings of the 3rd Workshop on Challenges for Achieving Self-Awareness in Autonomic Systems*, Philadelphia, USA, September 2013.

[BNL11] Marco Bernardo, Rocco De Nicola, and Michele Loreti. Uniform Labeled Transition Systems for Nondeterministic, Probabilistic, and Stochastic Process Calculi. In Luca Aceto and Mohammad Reza Mousavi, editors, *Proceedings First International Workshop on Process Algebra and Coordination*, volume 60 of *Electronic Proceedings in Theoretical Computer Science*, pages 66–75, July 2011.

[BNL12] Marco Bernardo, Rocco De Nicola, and Michele Loreti. Revisiting Trace and Testing Equivalences for Nondeterministic and Probabilistic Processes. In *Foundations of Software Science and Computational Structures - 15th International Conference, FOSSACS 2012, Held as Part of the European Joint Conferences on Theory and Practice of Software, ETAPS 2012, Tallinn, Estonia, March 24 - April 1, 2012*, volume 7213 of *Lecture Notes in Computer Science*, pages 195–209. Springer, 2012.

[BNL13] Marco Bernardo, Rocco De Nicola, and Michele Loreti. A uniform framework for modeling nondeterministic, probabilistic, stochastic, or mixed processes and their behavioral equivalences. *Information and Computation*, 225:29–82, 2013.

[BNVW14] Lenz Belzner, Rocco De Nicola, Andrea Vandin, and Martin Wirsing. Reasoning (on) Service Component Ensembles in Rewriting Logic. 2014. To appear in the proceedings of SAS 2014, Springer LNCS Festschrift.

[BP12a] Michele Boreale and Francesca Pampaloni. Quantitative Multirun Security under Active Adversaries. In Lisa O'Conner, editor, *QEST 2012, IEEE*, pages 158–167. IEEE Computer Society, 2012.

[BP12b] Michele Boreale and Michela Paolini. Worst- and Average-Case Privacy Breaches in Randomization Mechanisms. In Jos C.S. Baeten, Thomas Ball, and Frank S. De Boer, editors, *IFIP TCS 2012*, volume 7604 of *Lecture Notes in Computer Science*, pages 72–86. Springer, 2012.

[BPP11a] Michele Boreale, Francesca Pampaloni, and Michela Paolini. Asymptotic Information Leakage under One-Try Attacks. In Martin Hofmann, editor, *Foundations of Software Science and Computational Structures*, volume 6604 of *LNCS*, pages 396–410. Springer Berlin / Heidelberg, March 2011.

[BPP11b] Michele Boreale, Francesca Pampaloni, and Michela Paolini. Quantitative Information Flow, with a View. In Vijay Atluri and Claudia Diaz, editors, *Computer Security -*

*ESORICS 2011*, volume 6879 of *LNCS*, pages 588–606. Springer Berlin / Heidelberg, 2011.

[BPP12] Michele Boreale, Francesca Pampaloni, and Michela Paolini. Asymptotic Information Leakage under One-Try Attacks. *To appear on MSCS*, 2012.

[CNP+13] Luca Cesari, Rocco De Nicola, Rosario Pugliese, Mariachiara Puviani, Francesco Tiezzi, and Franco Zambonelli. Formalising Adaptation Patterns for Autonomic Ensembles. In *10th International Symposium on Formal Aspects of Component Software*, Nanchang, China, October 2013. Springer LNCS, Springer LNCS.

[CPT13] Luca Cesari, Rosario Pugliese, and Francesco Tiezzi. Blind-date Conversation Joining. In António Ravara and Josep Silva, editors, *Proceedings of the 9th International Workshop on Automated Specification and Verification of Web Systems*, 2013.

[DLLM11] Rocco De Nicola, Diego Latella, Michele Loreti, and Mieke Massink. State to Function Labelled Transition Systems: A Uniform Framework for Defining Stochastic Process Calculi. Technical Report ISTI-2011-TR-012, CNR - ISTI, May 2011.

[FJN+11] Yliès Falcone, Mohamad Jaber, Thanh Hung Nguyen, Marius Bozga, and Saddek Bensalem. Runtime Verification of Component-based Systems . In *SEFM*, 2011.

[GBL+11] Andreas Griesmayer, Saddek Bensalem, Axel Legay, Thanh-Hung Nguyen, and Doron Peled. Efficient Deadlock Detection for Concurrent Systems . In *MEMOCODE*, 2011.

[GHMW13] Fabio Gadducci, Matthias Hölzl, Giacoma Valentina Monreale, and Martin Wirsing. Soft Constraints for Lexicographic Orders. In Felix Castro, Alexander Gelbukh, and Miguel Gonzalez Mendoza, editors, *MICAI*, LNCS. Springer, 2013.

[GLLV12a] Fabio Gadducci, Alberto Lluch-Lafuente, and Andrea Vandin. Counterpart Semantics for a Second-Order-Calculus. *Fundam. Inform.*, 118(1-2):177–205, 2012.

[GLLV12b] Fabio Gadducci, Alberto Lluch-Lafuente, and Andrea Vandin. Exploiting Over- and Under-Approximations for Infinite-State Counterpart Models. In Hartmut Ehrig, Gregor Engels, Hans-Jörg Kreowski, and Grzegorz Rozenberg, editors, *ICGT*, volume 7562 of *Lecture Notes in Computer Science*, pages 51–65. Springer, 2012.

[GLP+12] Edmond Gjondrekaj, Michele Loreti, Rosario Pugliese, Francesco Tiezzi, Carlo Pinciroli, Manuele Brambilla, Mauro Birattari, and Marco Dorigo. Towards a Formal Verification Methodology for Collective RoboticSystems. In *Proc. of the 14th International Conference on Formal EngineeringMethods (ICFEM 2012)*, volume 7635 of *LNCS*, pages 54–70. Springer, 2012.

[GLPT12a] Edmond Gjondrekaj, Michele Loreti, Rosario Pugliese, and Francesco Tiezzi. Modeling Adaptation with a Tuple-based Coordination Language. In *Proc. of the 2012 ACM Symposium on Applied Computing (SAC'12), Special Track on Coordination Models, Languages and Applications*. ACM, 2012.

[GLPT12b] Edmond Gjondrekaj, Michele Loreti, Rosario Pugliese, and Francesco Tiezzi. Modeling Adaptation with Klaim. *Applied Computing Review*, 12(4):21–35, 2012.

[GM11] Fabio Gadducci and Giacoma Valentina Monreale. A Decentralised Graphical Implementation of Mobile Ambients. *Journal of Logic and Algebr. Program.*, 80(2):113–136, 2011.

[HK11] Rolf Hennicker and Alexander Knapp. Modal Interface Theories for Communication-Safe Component Assemblies. In Antonio Cerone and Pekka Pihlajasaari, editors, *Theoretical Aspects of Computing - ICTAC 2011 - 8th International Colloquium, Johannesburg, South Africa, August 31 - September 2, 2011. Proceedings*, volume 6916 of *Lecture Notes in Computer Science*, pages 135–153. Springer, 2011.

[KBP+13] Jaroslav Keznikl, Tomas Bures, Frantisek Plasil, Ilias Gerostathopoulos, Petr Hnetynka, and Nicklas Hoch. Design of ensemble-based component systems by invariant refinement. In *Proceedings of the 16th International ACM Sigsoft symposium on Component-based software engineering*, CBSE '13, pages 91–100, New York, NY, USA, 2013. ACM.

[KKK12] Nora Koch, Alexander Knapp, and Sergej Kozuruba. Assessment of Effort Reduction due to Model-to-Model Transformations in the Web Domain. In Marco Brambilla, Takehiro Tokuda, and Robert Tolksdorf, editors, *ICWE 2012 International Conference on Web Engineering*, volume 7387 of *LNCS*, page 8. Springer Verlag, July 2012.

[MBL+12a] Mieke Massink, Manuele Brambilla, Diego Latella, Marco Dorigo, and Mauro Birattari. Analysing Robot Swarm Decision-Making with Bio-PEPA. In Marco Dorigo, Mauro Birattari, Christian Blum, Anders Lyhne Christensen, Andries Petrus Engelbrecht, Roderich Groß, and Thomas Stützle, editors, *Swarm Intelligence - 8th International Conference, ANTS 2012*, volume 7461 of *LNCS*, pages 25–36, Brussels, Belgium, September 2012. Springer.

[MBL+12b] Mieke Massink, Manuele Brambilla, Diego Latella, Marco Dorigo, and Mauro Birattari. Analysing Robot Swarm Decision-making with Bio-PEPA. Technical Report TR/IRIDIA/2012-005, Universitè Libre de Bruxelles - IRIDIA, April 2012. Extended version of paper presented at ANTS 2012 (Bruxelles, Sept. 2012).

[MBL+13] Mieke Massink, Manuele Brambilla, Diego Latella, Marco Dorigo, and Mauro Birattari. On the use of Bio-PEPA for modelling and analysing collective behaviours in swarm robotics. *Swarm Intelligence*, 7(2-3):201–228, 2013.

[MKH+13] Philip Mayer, Annabelle Klarl, Rolf Hennicker, Mariachiara Puviani, Francesco Tiezzi, Rosario Pugliese, Jaroslav Keznikl, and Tomáš Bureš. The Autonomic Cloud: A Vision of Voluntary, Peer-2-Peer Cloud Computing. In *Proceedings of 3rd Workshop on Challenges for Achieving Self-Awareness in Autonomic Systems*, pages 1–6, Philadelphia, USA, September 2013.

[MMH12] Giacoma Valentina Monreale, Ugo Montanari, and Nicklas Hoch. Soft Constraint Logic Programming for Electric Vehicle Travel Optimization. In *WLP*, pages 3–19, 2012.

[MMPT13a] Andrea Margheri, Massimiliano Masi, Rosario Pugliese, and Francesco Tiezzi. Developing and Enforcing Policies for Access Control, Resource Usage, and Adaptation – A Practical Approach. In Chun Ouyang and Emilio Tuosto, editors, *Proc. of the 10th International Workshop on Web Services and Formal Methods: Formal Aspects of Service-Oriented and Cloud Computing*, 2013.

[MMPT13b] Andrea Margheri, Massimiliano Masi, Rosario Pugliese, and Francesco Tiezzi. On a Formal and User-Friendly Linguistic Approach to Access Control of Electronic Health Data. In *Proc. of the 6th International Conference on Health Informatics (HEALTHINF13)*, 2013.

[MPT11] Massimiliano Masi, Rosario Pugliese, and Francesco Tiezzi. A Standard-Driven Communication Protocol for Disconnected Clinics in Rural Areas. In George Demiris and Kendall Ho, editors, *Proc. of HEALTHCOM 2011*, pages 308–315. IEEE, 2011.

[MPT12] Massimiliano Masi, Rosario Pugliese, and Francesco Tiezzi. Formalisation and Implementation of the XACML Access Control Mechanism. In *Proc. of the 4th International Symposium on Engineering Secure Software and Systems (ESSoS'12)*, volume 7159 of *LNCS*. Springer, 2012.

[MPT13] Andrea Margheri, Rosario Pugliese, and Francesco Tiezzi. Linguistic Abstractions for Programming and Policing Autonomic Computing Systems. In Sara Foresti, Vallipuram Muthukkumarasamy, and Duncan S. Wong, editors, *Proc. of the 10th IEEE International Conference on Autonomic and Trusted Computing (ATC)*, 2013. To appear.

[MS13] Ugo Montanari and Alain Tcheukam Siwe. Real time market models and prosumer profiling. In *Proceedings of the IEEE INFOCOM 2013, Turin, Italy, April 14-19, 2013*, pages 3183–3188. IEEE, 2013.

[MV12] Ugo Montanari and Emil Vassev. Soft Constraints for KnowLang. In *Proceedings of C* Conference on Computer Science & Software Engineering (C3S2E '12)*, pages 99–103. ACM, 2012.

[NFLP13] Rocco De Nicola, Gian-Luigi Ferrari, Michele Loreti, and Rosario Pugliese. A Language-based Approach to Autonomic Computing. In *Formal Methods for Components and Objects*, volume 7542 of *Lecture Notes in Computer Science*, pages 25–48. Springer, 2013.

[PPC+13] Mariachiara Puviani, Carlo Pinciroli, Giacomo Cabri, Letizia Leonardi, and Franco Zambonelli. Is Self-Expression Useful? Evaluation by a Case Study. In *2013 Workshops on Enabling Technologies: Infrastructure for Collaborative Enterprises (WETICE 2013)*, pages 62–67, Hammamet (TN), June 2013. IEEE Computer Society.

[PT12] Rosario Pugliese and Francesco Tiezzi. A Calculus for Orchestration of Web Services. *Journal of Applied Logic*, 10(1):2–31, 2012.

[SBK13] Nikola Serbedzija, Tomas Bures, and Jaroslaw Keznikl. Engineering Autonomous Systems. In *PCI'13 Proceedings of the 17th Panhellenic Conference on Informatics, Thessaloniki, Greece*, pages 128–135, September 2013.

[WHB+12] Stefan Wismer, Gregory Hitz, Michael Bonani, Alexey Gribovskiy, Cedric Pradalier, and Stéphane Magnenat. Autonomous Construction of a Roofed Structure: Synthesizing Planning and Stigmergy on a Mobile Robot. In *IEEE/RSJ International Conference on Intelligent Robots and Systems*, 2012.

[WHTZ12] Martin Wirsing, Matthias Hölzl, Mirco Tribastone, and Franco Zambonelli. ASCENS: Engineering Autonomic Service-Component Ensembles. In Bernhard Beckert, Ferruccio Damiani, Marcello Bonsangue, and Frank de Boer, editors, *Formal Methods for Components and Objects, 10th International Symposium, FMCO 2011*, LNCS. Springer, 2012.

[ZH11] Gefei Zhang and Matthias Hölzl. Aspect-Oriented Modeling of Web Applications with HiLA. In Andreas Harth and Nora Koch, editors, *Current Trends in Web Engineering*

*- 11th International Conference on Web Engineering, ICWE 2011 Workshops*, LNCS, Paphos, Cyprus, June 2011. Springer.

[ZH12] Gefei Zhang and Matthias Hölzl. Weaving Semantic Aspects in HiLA. In *Proc. of Aspect-Oriented Software Development (AOSD'12)*. ACM, 2012.

### 2.3.2 Non-Joint Publications

[AB12] Lucia Acciai and Michele Boreale. Deciding Safety Properties in Infinite-State Pi-Calculus Via BehaviouralTypes. *Inf. Comput*, 212:92–117, 2012.

[ABB+13] Paul Attie, Saddek Bensalem, Marius Bozga, Mohamad Jaber, Joseph Sifakis, and Fadi Zaraket. An Abstract Framework for Deadlock Prevention in BIP. In *Proc. FORTE/FMOODS*. Springer, 2013.

[ABZ12] Dhaminda Abeywickrama, Nicola Bicocchi, and Franco Zambonelli. SOTA: Towards a General Model for Self-Adaptive Systems. In *21st IEEE International Workshop on Enabling Technologies: Infrastructure for Collaborative Enterprises*, pages 48–53, Toulouse (F), June 2012. IEEE CS Press.

[ALLS13] Michele Amoretti, Alberto Lluch-Lafuente, and Stefano Sebastio. A Cooperative Approach for Distributed Task Execution in Autonomic Clouds. In *PDP*, pages 274–281. IEEE Computer Society, 2013.

[AZ12] Dhaminda Abeywickrama and Franco Zambonelli. Model Checking Goal-oriented Requirements for Self-Adaptive Systems. In *19th IEEE Conference on the Engineering of Computer-based Systems*, pages 33–42, Novi Sad, Serbia, April 2012. IEEE CS Press.

[BBB13] Chiara Bodei, Linda Brodo, and Roberto Bruni. Open Multiparty Interaction. In Narciso Martí-Oliet and Miguel Palomino, editors, *Recent Trends in Algebraic Development Techniques, 21st International Workshop, WADT 2012*, volume 7841 of *Lecture Notes in Computer Science*, pages 1–23. Springer, 2013.

[BBD+12] Saddek Bensalem, Marius Bozga, Benoît Delahaye, Cyrille Jégourel, Axel Legay, and Ayoub Nouri. Statistical Model Checking QoS Properties of Systems with SBIP. In Tiziana Margaria and Bernhard Steffen, editors, *ISoLA (1)*, volume 7609 of *Lecture Notes in Computer Science*, pages 327–341. Springer, 2012.

[BBHK13] Lubomír Bulej, Tomáš Bureš, Vojtěch Horký, and Jaroslav Keznikl. Adaptive deployment in ad-hoc systems using emergent component ensembles: vision paper. In *Proceedings of the 4th ACM/SPEC International Conference on Performance Engineering*, ICPE '13, pages 343–346, New York, NY, USA, 2013. ACM.

[BBK+12] Lubomír Bulej, Tomáš Bureš, Jaroslav Keznikl, Alena Koubková, Andrej Podzimek, and Petr Tůma. Capturing performance assumptions using stochastic performance logic. In *Proceedings of the third joint WOSP/SIPEW international conferenceon Performance Engineering*, ICPE '12, pages 311–322, New York, NY, USA, 2012. ACM.

[BBLM12] Luca Bortolussi, Jean-Yves Le Boudec, Diego Latella, and Mieke Massink. Revisiting the Limit Behaviour of "El Botellon. Technical Report EPFL-REPORT-179935, École Polytechnique Fédérale de Lausanne - INFOSCIENCE, July 2012.

[BBPQ12] Saddek Bensalem, Marius Bozga, Doron Peled, and Jean Quilbeuf. Knowledge Based Transactional Behavior. In *Proceedings of the 8th Haifa Verification Conference (HVC'12)*, 2012.

[BBQS12a] Saddek Bensalem, Marius Bozga, Jean Quilbeuf, and Joseph Sifakis. Knowledge-Based Distributed Conflict Resolution for Multiparty Interactions and Priorities. In Holger Giese and Grigore Rosu, editors, *FMOODS/FORTE*, volume 7273 of *Lecture Notes in Computer Science*, pages 118–134. Springer, 2012.

[BBQS12b] Saddek Bensalem, Marius Bozga, Jean Quilbeuf, and Joseph Sifakis. Optimized Distributed Implementation of Multiparty Interactions with Observation. In *Proceedings of AGERE! Workshop (SPLASH'12)*, 2012.

[BCF+13] Nicola Bicocchi, Alket Cecaj, Damiano Fontana, Marco Mamei, Andrea Sassi, and Franco Zambonelli. Collective Awareness for Human-ICT Collaboration in Smart Cities. In *2013 Workshops on Enabling Technologies: Infrastructure for Collaborative Enterprises (WETICE 2013)*, Hammamet (TN), June 2013. IEEE Computer Society.

[BCG12] Michele Boreale, David Clark, and Daniele Gorla. A Semiring-Based Trace Semantics for Processes with Applications to Information Leakage Analysis. *To appear on MSCS*, 2012.

[BCL+12] Nicola Bicocchi, Gabriella Castelli, Matteo Lasagni, Marco Mamei, and Franco Zambonelli. Experiences on Sensor Fusion with Commonsense Reasoning. In *9th PerCom Workshop on Context Modeling and Reasoning*, pages 596–601, Lugano (CH), March 2012. IEEE CS Press.

[BCMZ11a] Nicola Bicocchi, Gabriella Castelli, Marco Mamei, and Franco Zambonelli. Augmenting Mobile Localization with Activities and Common Sense Knowledge. In *International Joint Conference on Ambient Intelligence*, Lecture Notes in Computer Science, Amsterdam (NL), November 2011. Springer Verlag.

[BCMZ11b] Nicola Bicocchi, Gabriella Castelli, Marco Mamei, and Franco Zambonelli. Improving Situation Recognition via Commonsense Sensor Fusion. In *1st DEXA Workshop on Information Systems for Situation Awareness and Situation Management*, Toulouse (F), September 2011. IEEE CS Press.

[BDF11a] Chiara Bodei, Viet Dung Dinh, and Gian-Luigi Ferrari. A G-Local $\pi$-calculus. In *Fourth Workshop on Programming Language Approaches to Concurrency and Communication-cEntric Software, PLACES 2011*, pages 1–8, 2011.

[BDF11b] Chiara Bodei, Viet Dung Dinh, and Gian-Luigi Ferrari. Predicting global usages of resources endowed with local policies. In Mohammad Reza Mousavi and António Ravara, editors, *FOCLASA*, volume 58 of *EPTCS*, pages 49–64, 2011.

[BDF+12] Chiara Bodei, Pierpaolo Degano, Gian-Luigi Ferrari, Letterio Galletta, and Gianluca Mezzetti. Formalising Security in Ubiquitous and Cloud Scenarios. In Agostino Cortesi, Nabendu Chaki, Khalid Saeed, and Sławomir Wierzchoń, editors, *Computer Information Systems and Industrial Management*, volume 7564 of *Lecture Notes in Computer Science*. Springer Berlin Heidelberg, 2012.

[BFMZ13] Nicola Bicocchi, Damiano Fontana, Marco Mamei, and Franco Zambonelli. Collective Awareness and Action in Urban Superorganisms. In *IEEE International Conference on Communications, Workshop on Collective Awareness Platforms*, Budapest (H), June 2013. IEEE.

[BGH+13] Tomas Bures, Ilias Gerostathopoulos, Petr Hnetynka, Jaroslav Keznikl, Michal Kit, and Frantisek Plasil. DEECO: an ensemble-based component system. In *Proceedings of the 16th International ACM Sigsoft symposium on Component-based software engineering*, CBSE '13, pages 81–90, New York, NY, USA, 2013. ACM.

[BHL12] Sebastian Bauer, Rolf Hennicker, and Axel Legay. Component Interfaces with Contracts on Ports. In Corina Pasareanu and Gwen Salaun, editors, *Proc. Formal Aspects of Computing*, 2012.

[BHL13] Sebastian Bauer, Rolf Hennicker, and Axel Legay. A Meta-Theory for Component Interfaces with Contracts on Ports. *Science of Computer Programming*, 2013.

[BHLM11] Luca Bortolussi, Jane Hillston, Diego Latella, and Mieke Massink. Continuous Approximation of Collective Systems Behaviour: a Tutorial. Technical Report ISTI-2011-TR-021, CNR - ISTI, October 2011.

[BHLM13] Luca Bortolussi, Jane Hillston, Diego Latella, and Mieke Massink. Continuous approximation of collective systems behaviour: a tutorial. *Performance Evaluation*, 70(5):317, 2013.

[BHW11] Sebastian S. Bauer, Rolf Hennicker, and Martin Wirsing. Interface theories for concurrency and data. *Theoretical Computer Science*, 412(28):3101–3121, 2011. Festschrift in Honour of Jan Bergstra.

[BHW12] Sebastian Bauer, Rolf Hennicker, and Martin Wirsing. Building a Modal Interface Theory for Concurrency and Data. In Till Mossakowski and Hans-Jörg Kreowski, editors, *Recent Trends in Algebraic Development Techniques*, volume 7137 of *Lecture Notes in Computer Science*, pages 1–12. Springer Berlin / Heidelberg, 2012.

[BJMS12] Marius Bozga, Mohamad Jaber, Nikolaos Maris, and Joseph Sifakis. Modeling Dynamic Architectures Using Dy-BIP. In Thomas Gschwind, Flavio De Paoli, Volker Gruhn, and Matthias Book, editors, *Software Composition*, volume 7306 of *Lecture Notes in Computer Science*, pages 1–16. Springer, 2012. best paper award.

[BLL+11] Sebastian S. Bauer, Kim G. Larsen, Axel Legay, Ulrik Nyman, and Andrzej Wasowski. A Modal Specification Theory for Components with Data. In Farhad Arbab and Peter Csaba Ölveczky, editors, *Proceedings of FACS 2011, 8th International Symposium on Formal Aspects of Component Software*, LNCS. Springer Verlag, 2011. To appear.

[BLM13] Luca Bortolussi, Diego Latella, and Mieke Massink. Stochastic Process Algebra and Stability Analysis of Collective Systems. In Rocco De Nicola and Christine Julien, editors, *Coordination Models and Languages*, volume 7890 of *LNCS*. Springer, 2013.

[BLZ12] Nicola Bicocchi, Matteo Lasagni, and Franco Zambonelli. Bridging Vision and Commonsense for Multimodal Situation Recognition in Pervasive Systems. In *10th IEEE Conference on Pervasive Computing and Communication*, pages 48–56, Lugano (CH), March 2012. IEEE CS Press.

[BML11] Sebastian S. Bauer, Philip Mayer, and Axel Legay. MIO Workbench: A Tool for Compositional Design with Modal Input/Output Interfaces. In Tevfik Bultan and Pao-Ann Hsiung, editors, *Proceedings of ATVA 2011, 9th International Symposium on Automated Technology for Verification and Analysis*, LNCS. Springer Verlag, 2011. To appear.

[BMZ12a] Nicola Bicocchi, Marco Mamei, and Franco Zambonelli. In-Network Aggregation of High-Level Sensorial Knowledge for Environment-aware Services and Ensembles. In Misra Bijan, editor, *Computational Intelligence in Sensor Networks*. Springer Verlag, Berlin (D), 2012.

[BMZ12b] Nicola Bicocchi, Marco Mamei, and Franco Zambonelli. Towards Self-organizing Virtual Macro Sensors. *ACM Transactions on Autonomous and Adaptive Systems*, 7(1), April 2012.

[BPBD12] Manuele Brambilla, Carlo Pinciroli, Mauro Birattari, and Marco Dorigo. Property-driven Design for Swarm Robotics. In Vincent Conitzer, Michael Winikoff, Lin Padgham, and Wiebe van der Hoek, editors, *Proceedings of 11th International Conference on Autonomous Agents and Multiagent Systems (AAMAS 2012)*, pages 139–146. International Foundation for Autonomous Agents and Multiagent Systems (http://www.ifaamas.org/Proceedings/aamas2012), 2012.

[BT12] Luca Bortolussi and Mirco Tribastone. Fluid Limits of Queueing Networks with Batches. In *Proceedings of the third joint WOSP/SIPEW international conference on Performance Engineering*, ICPE '12, pages 45–56, New York, NY, USA, 2012. ACM.

[CAC12] Nicola Capodieci, Emanuel Alsina, and Giacomo Cabri. A Context-aware Agent-based Approach for Deregulated Energy Market. In *Proceedings of the 21st IEEE WETICE confreence Toulouse, France, June 2012*, pages 16–21, June 2012.

[CAC13] Nicola Capodieci, Emanuel Alsina, and Giacomo Cabri. Context-awareness in the deregulated electric energy market: an agent-based approach. *Concurrency and Computation: Practice and Experience*, page online, March 2013.

[CC12a] Nicola Capodieci and Giacomo Cabri. Conceptual Map and Classification in Ensembles of Autonomic Components: from Awareness to Organization. In *Proceedings of the workshops of SASO 2012, Lyon France, September 2012*, page to appear, September 2012.

[CC12b] Nicola Capodieci and Giacomo Cabri. Coordination And Task Division In Robot Ensembles: Perimeter Sweep Case Study. In *Proceedings of the 21st IEEE WETICE confreence Toulouse, France, June 2012*, pages 101–103, June 2012.

[CC13a] Giacomo Cabri and Nicola Capodieci. Runtime Change of Collaboration Patterns in Autonomic Systems: Motivations and Perspectives. In Leonard Barolli, Fatos Xhafa, Makoto Takizawa, Tomoya Enokido, and Hui-Huang Hsu, editors, *Proceedings of the Ninth International Symposium on Frontiers of Information Systems and Network Applications (FINA), Barcelona, Spain, March 2013*, pages 1038 – 1043. IEEE Computer Society, Conference Publishing Service, March 2013.

[CC13b] Nicola Capodieci and Giacomo Cabri. Collaboration in Swarm Robotics: a Visual Communication Approach. In Waleed W. Smari and Geoffrey C. Fox, editors, *Proceedings of the 2013 International Conference on Collaboration Technologies and Systems, San*

*Diego, USA, May 2013*, pages 195 – 202. IEEE Computer Society, Conference Publishing Service, May 2013.

[CCPA12] Nicola Capodieci, Giacomo Cabri, Andrea Pagani, and Marco Aiello. An Agent-based Application to Enable Deregulated Energy Markets. In *Proceedings of the 36th IEEE Computer Software and Applications Conference (COMPSAC 2012), Izmir Turkey, July 2012*, pages 638–647, July 2012.

[CHC13] Nicola Capodieci, Emma Hart, and Giacomo Cabri. An immune network approach for self-adaptive ensembles of autonomic components: a case study in swarm robotics. In Pietro Liò, Orazio Miglino, Giuseppe Nicosia, Stefano Nolfi, and Mario Pavone, editors, *Proceedings of the 12th European Conference on Artificial Life (ECAL), Taormina, Italy, September 2013*, pages 864–871. MIT Press, September 2013.

[CNT13a] Alessandro Celestini, Rocco De Nicola, and Francesco Tiezzi. Network-aware Evaluation Environment for Reputation Systems. In M. Carmen Fernàndez Gago, Fabio Martinelli, Siani Pearson, and Isaac Agudo, editors, *Proc. of 7th IFIP WG 11.11 International Conference on Trust Management (IFIPTM 2013)*, volume 40 of *IFIP AICT*, pages 231–238. Springer, 2013.

[CNT13b] Alessandro Celestini, Rocco De Nicola, and Francesco Tiezzi. Specifying and Analysing Reputation Systems with Coordination Languages. Technical report, IMT Advanced Studies Lucca, 2013.

[CPCA11] Nicola Capodieci, Giuliano Andrea Pagani, Giacomo Cabri, and Marco Aiello. Smart Meter-aware Domestic Energy Trading Agents. In *Proceedings of the First International E-Energy Market Challenge (IEEMC 2011) at the 8th International Conference on Autonomic Computing*, Karlsruhe (D), June 2011. ACM Press.

[CPZ11] Giacomo Cabri, Mariachiara Puviani, and Franco Zambonelli. Towards a Taxonomy of Adaptive Agent-based Collaboration Patterns for Autonomic Service Ensembles. In *2011 International Conference on Collaboration Technologies and Systems*, pages 508–515, Philadelphia (PA), May 2011. IEEE Press.

[CT11] Giuliano Casale and Mirco Tribastone. Fluid Analysis of Queueing in Two-Stage Random Environments. In *Proceedings of the Eighth International Conference on Quantitative Evaluation of Systems (QEST)*, pages 21–30, Aachen, Germany, September 2011. IEEE Computer Society Press.

[DFGM12a] Pierpaolo Degano, Gian-Luigi Ferrari, Letterio Galletta, and Gianluca Mezzetti. Typing Context-Dependent Behavioural Variations. In *PLACES 2012*, volume to appear in EPTCS, 2012.

[DFGM12b] Pierpaolo Degano, Gian-Luigi Ferrari, Letterio Galletta, and Gianluca Mezzetti. Typing for coordinating Secure Behavioural Variations. In *Coordination Models and Languages*, volume 7274 of *Lecture Notes in Computer Science*. Springer, 2012.

[DFM12] Pierpaolo Degano, Gian-Luigi Ferrari, and Gianluca Mezzetti. Nominal Automata for Resource Usage Control. In *Implementation and Application of Automata - 17th International Conference*, volume 7381 of *Lecture Notes in Computer Science*, pages 125–137. Springer, 2012.

[DFM13] Pierpaolo Degano, Gian Luigi Ferrari, and Gianluca Mezzetti. Towards Nominal Context-Free Model-Checking. In *CIAA*, pages 109–121, 2013.

[DL12] Liliana D'Errico and Michele Loreti. Context Aware Specification and Verification of Distributed Systems. In R. Bruni and Vladimiro Sassone, editors, *Trustworthy Global Computing - 6th International Symposium, TGC 2011, Aachen, Germany, June 9-10, 2011. Revised Selected Papers.*, volume 7173 of *Lecture Notes in Computer Science*, pages 142–159. Springer, 2012.

[Dor12] Marco Dorigo. Swarm Intelligence research at IRIDIA, Université Libre de Bruxelles. *Mathware & Soft Computing*, 19(2):19–22, 2012.

[EMA+12] Jonas Eckhardt, Tobias Mühlbauer, Musab AlTurki, José Meseguer, and Martin Wirsing. Stable Availability under Denial of Service Attacks through Formal Patterns. In *15th International Conference on Fundamentals of Software Engineering (FASE'12)*, LNCS. Springer, 2012.

[FST+12] Eliseo Ferrante, W Sun, Ali Emre Turgut, Marco Dorigo, Mauro Birattari, and Tom Wenseleers. Self-organized Flocking with Conflicting Goal Directions. In *ECCS'2012, European Conference on Complex Systems*, 2012.

[FTM+12] Eliseo Ferrante, Ali Emre Turgut, Cristian Huepe Minoletti, Alessandro Stranieri, Carlo Pinciroli, and Marco Dorigo. Self-Organized Flocking with a Mobile Robot Swarm: a Novel Motion Control Method. *Adaptive Behavior*, 20(6):460–477, 2012.

[GBC+12] Roberto Guanciale, Roberto Bruni, Andrea Corradini, Gianluigi Ferrari, Tito Flagella, and Giorgio Spagnolo. Applying Process Analysis to the Italian eGovernment EnterpriseArchitecture. In *Proceedings of WS-FM 2011, 8th International Workshop on Web Servicesand Formal Methods*, volume 7176 of *LNCS*, pages 111–127. Springer, 2012.

[GM12] Fabio Gadducci and Giacoma Valentina Monreale. Barbed Semantics for Open Reactive Systems. In Narciso Martí-Oliet and Miguel Palomino, editors, *WADT*, volume 7841 of *LNCS*, pages 161–177. Springer, 2012.

[GMM13] Fabio Gadducci, Giacoma Valentina Monreale, and Ugo Montanari. A Modular LTS for Open Reactive Systems. In *IFIP TCS*, volume 7604 of *LNCS*, pages 134–148. Springer, 2013.

[HHM13a] Serge Haddad, Rolf Hennicker, and Mikael H. Møller. Channel Properties of Asynchronously Composed Petri Nets. In *Petri Nets*, pages 369–388, 2013.

[HHM13b] Serge Haddad, Rolf Hennicker, and Mikael H. Møller. Specification of Asynchronous Component Systems with Modal I/O-Petri Nets. In Martin Abadi and Alberto Lluch Lafuente, editors, *Trustworthy Global Computing*, LNCS. Springer, 2013.

[HK14] Rolf Hennicker and Annabelle Klarl. Foundations for Ensemble Modeling - The Helena Approach. April 2014.

[HL12] Rolf Hennicker and Matthias Ludwig. View-Based Development of a Simulation Framework for Multi-disciplinary Environmental Modelling. In Radu Calinescu and David Garlan, editors, *Proc. 17th Int. Wsh. Monterey. Development, Operation and Management of Large-Scale Complex IT Systems (Monterey'12)*, volume 7539 of *Lect. Notes Comp. Sci.*, pages 224–250. Springer, Berlin, 2012. (To appear).

[HW11] Matthias Hölzl and Martin Wirsing. Towards a System Model for Ensembles. In Gul Agha, Olivier Danvy, and José Meseguer, editors, *Festschrift in honor of Carolyn Talcott*, volume 7000 of *LNCS*. Springer, 2011.

[KBPK12] Jaroslav Keznikl, Tomas Bures, Frantisek Plasil, and Michal Kit. Towards Dependable Emergent Ensembles of Components: The DEECo ComponentModel. In Muhammad Ali Babar, Carlos E. Cuesta, and Juha Erik Savolainen, editors, *Proceedings of WICSA/ECSA 2012*, pages 249–252, August 2012.

[LBBB13] Axel Legay, Saddek Bensalem, Benoit Boyer, and Marius Bozga. Incremental Generation of Linear Invariants for Component-Based Systems. In *13th International Conference on Application of Concurrency to System Design (ACSD)*, pages 80–89. IEEE, 2013.

[LMdV12] Diego Latella, Mieke Massink, and Erik de Vink. Bisimulation of Labeled State-to-Function Transition Systems of Stochastic Process Languages. In Ulrike Golas and Thomas Soboll, editors, *Proceedings Seventh ACCAT Workshop on Applied and Computational Category Theory*, volume 93 of *EPTSC*, pages 23 – 43, Tallinn, Estonia, 2012. EPTCS.

[LMdV13] Diego Latella, Mieke Massink, and Erik de Vink. Coalgebraic Bisimulation of FuTS. Technical Report 09, ASCENS, January 2013.

[LV11] Alberto Lluch Lafuente and Andrea Vandin. Towards a Maude Tool for Model Checking Temporal Graph Properties. In Fabio Gadducci and Leonardo Mariani, editors, *Proceedings of the 10th International Workshop on Graph Transformation and Visual Modelling Languages (GT-VMT'11)*. ECEAAST, 2011. To appear.

[MKZ+13] Lukas Marek, S. Kell, Y. Zheng, Lubomír Bulej, Petr Tůma, W. Binder, D. Ansaloni, A. Sarimbekov, and A. Sewe. ShadowVM: Robust and Comprehensive Dynamic Program Analysis for the Java Platform. In *Proceedings of the 12th International Conference on Generative Programming: Concepts & Experiences*, Indianapolis, IN, USA, October 2013.

[ML12] Mieke Massink and Diego Latella. Fluid Analysis of Foraging Ants. In Marjan Sirjani, editor, *Coordination Models and Languages (COORDINATION 2012)*, volume 7274 of *LNCS*, pages 152–165. Springer-Verlag, June 2012.

[MLB+12] Mieke Massink, Diego Latella, Andrea Bracciali, Michael Harrison, and Jane Hillston. Scalable context-dependent analysis of emergency egress models. *Formal Aspects of Computing. The International Journal of FormalMethods*, 24(2):267–302, 2012.

[MLBH11] Mieke Massink, Diego Latella, Andrea Bracciali, and Jane Hillston. Modelling Non-linear Crowd Dynamics in Bio-PEPA. In Dimitra Giannakopoulou and Fernando Orejas, editors, *Fundamental Approaches to Software Engineering (FASE 2011)*, volume 6603 of *LNCS*, pages 96–110. Springer-Verlag, May 2011.

[MPBH13] Michal Malohlava, Frantisek Plasil, Tomas Bures, and Petr Hnetynka. Interoperable domain-specific languages families for code generation. *Software: Practice and Experience*, 43(5):479–499, 2013.

[MS12a] Philip Mayer and Andreas Schroeder. Cross-Language Code Analysis and Refactoring. In *12th IEEE International Working Conference on Source Code Analysis and Manipulation*, September 2012.

[MS12b] Ugo Montanari and Matteo Sammartino. Network Conscious pi-calculus: a Concurrent Semantics. *To appear in Electronic Notes in Theoretical Computer Science*, 2012. http://www.di.unipi.it/˜sammarti/papers/mfps28.pdf.

[MS13a] Philip Mayer and Andreas Schroeder. Patterns of Cross-Language Linking in Java Frameworks. In *Proc. ICPC*, pages 113–122. IEEE, May 2013.

[MS13b] Ugo Montanari and Matteo Sammartino. A network-conscious pi-calculus and its coalgebraic semantics. *Theoretical Computer Science (to appear)*, 2013.

[NMT11] Rocco De Nicola, Andrea Margheri, and Francesco Tiezzi. Orchestrating Tuple-based Languages. In Roberto Bruni and Vladimiro Sassone, editors, *Proc. of TGC*. Springer, 2011.

[PCF12] Mariachiara Puviani, Giacomo Cabri, and Regina Frei. Self-healing in Ensembles' Adaptive Collaborative Patterns. In *1st International Conference on Through-life Engineering Services (TESConf 2012)*, November 2012.

[PCL12] Mariachiara Puviani, Giacomo Cabri, and Letizia Leonardi. Adaptive Patterns for Intelligent Distributed Systems: a Swarm Robotics Case Study. In *Proceedings of the 6th International Symposium on Intelligent Distributed Computing - IDC 2012*, Studies in Computational Intelligence, pages 241 – 246. Sringer, September 2012.

[PCZ13] Mariachiara Puviani, Giacomo Cabri, and Franco Zambonelli. A Taxonomy of Architectural Patterns for Self-adaptive Systems. In *Sixth International C* Conference on Computer Science & Software Engineering*, pages 77–85, Porto (P), July 2013. ACM, ACM.

[PF13] Mariachiara Puviani and Regina Frei. Self-Management for Cloud Computing. In *SAI conference*, London (UK), October 2013. IEEE Xplore, IEEE Xplore.

[PPO+12] Tomas Pop, Frantisek Plasil, Matej Outly, Michal Malohlava, and Tomas Bures. Property Networks allowing Oracle-Based Mode-Change Propagationin Hierarchical Components. In *Proceedings of the 15th ACM SIGSOFT Symposium on Component Based-Software Engineering*, CBSE '12, pages 93–102, New York, NY, USA, 2012. ACM.

[PTO+11] Carlo Pinciroli, Vito Trianni, Rehan O'Grady, Giovanni Pini, Arne Brutschy, Manuele Brambilla, Nithin Mathews, Eliseo Ferrante, Gianni Di Caro, Frederick Ducatelle, Timothy Stirling, Alvaro Gutierrez, Luca Maria Gambardella, and Marco Dorigo. ARGoS: a Modular, Multi-Engine Simulator for Heterogeneous Swarm Robotics. In *Proceedings of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2011)*. IEEE Press, Piscataway, NJ, September 2011.

[PTO+12] Carlo Pinciroli, Vito Trianni, Rehan O'Grady, Giovanni Pini, Arne Brutschy, Manuele Brambilla, Nithin Mathews, Eliseo Ferrante, Gianni Di Caro, Frederick Ducatelle, Luca Maria Gambardella, and Marco Dorigo. ARGoS: a modular, multi-engine simulator for heterogeneous swarmrobotics. *Swarm Intelligence*, 6(4):271–295, 2012.

[Puv12] Mariachiara Puviani. Adaptive System's Configuration in a Swarm Robotics Scenario. *Awareness magazine*, page 3, October 2012.

[Ser12] Nikola Serbedzija. Engineering Adaptation: A Component Based Model. In *Proc. ADVCOMP 2012*, September 2012.

[Ser13] Nikola Serbedzija. Autonomous Systems: from Requirements to Modeling and Implementation. In *Proc. ICAS 2013*, March 2013.

[SFT+11] Alessandro Stranieri, Eliseo Ferrante, Ali Emre Turgut, Vito Trianni, Carlo Pinciroli, Mauro Birattari, and Marco Dorigo. Self-Organized Flocking with a Heterogeneous Mobile Robot Swarm. In *Advances in Artificial Life, ECAL 2011*, pages 789–796. MIT press, Cambridge, MA, August 2011.

[tBLLP13] Maurice H. ter Beek, Alberto Lluch-Lafuente, and Marinella Petrocchi. Combining Declarative and Procedural Views in the Specification and Analysis of Product Families. In *SPLC Workshops*, pages 10–17. ACM, 2013.

[TCBS13] Ahlem Triki, Jacques Combaz, Saddek Bensalem, and Joseph Sifakis. Model-Based Implementation of Parallel Real-Time Systems. In *FASE*, Lecture Notes in Computer Science, pages 235–249. Springer, 2013.

[Tri11] Mirco Tribastone. Approximate Mean Value Analysis of Process Algebra Models. In *MASCOTS: IEEE 19th International Symposium on Modelling, Analysis and Simulation of Computer and Telecommunication Systems*, pages 369–378, Singapore, July 2011. IEEE Computer Society Press.

[TT11] Max Tschaikowski and Mirco Tribastone. Refined Theory of Packages. In *Tenth Workshop on Process Algebra and Stochastically Timed Activities*, Ragusa, Italy, September 2011.

[TT12a] Max Tschaikowski and Mirco Tribastone. Exact Fluid Lumpability for Markovian Process Algebra. In *23rd International Conference on Concurrency Theory*, pages 380,394, September 2012.

[TT12b] Max Tschaikowski and Mirco Tribastone. Generalised Communication for Interacting Agents. In *9th International Conference on Quantitative Evaluation of Systems*, September 2012. To appear.

[Vas11a] Emil Vassev. Knowledge Representation for Autonomous Systems - The "ASCENS"Case Study [Organic Computing - Design of Self-Organizing Systems(Dagstuhl Seminar 11181)]. *Dagstuhl Reports*, 1(5):16–17, May 2011.

[Vas11b] Emil Vassev. Knowledge Representation for Intelligent Systems. In Phillip A. Laplante, editor, *Encyclopedia of Software Engineering*, pages 1–13. Taylor & Francis, 2011.

[vEJ12] Christian von Essen and Barbara Jobstmann. Synthesizing Efficient Controllers. In *International Conference on Verification, Model Checking, and Abstract Interpretation (VMCAI)*, pages 428–444, 2012.

[VH11a] Emil Vassev and Mike Hinchey. Knowledge Representation and Awareness in Autonomic Service-Component Ensembles - State of the Art. In *14th IEEE International Symposium on Object/Component/Service-oriented Real-time Distributed Computing*, pages 110–119. IEEE Computer Society, March 2011.

[VH11b] Emil Vassev and Mike Hinchey. Knowledge Representation and Reasoning for Intelligent Software Systems. *IEEE Computer*, 44(8):96–99, August 2011.

[VH11c] Emil Vassev and Mike Hinchey. Representing Knowledge in Robotic Systems with KnowLang. In *Proceedings of the 1st International ISoLA Workshop on Software Aspects of Robotic Systems*, Communications in Computer and Information Science. Springer Verlag, Heidelberg, October 2011.

[VH11d] Emil Vassev and Mike Hinchey. Towards a Formal Language for Knowledge Representation in Autonomic Service-Component Ensembles. In *Proceedings of the 3rd International Conference on Data Mining and Intelligent Information Technology Applications (ICMIA2011)*. AICIT, IEEE Xplore, October 2011.

[VH12a] Emil Vassev and Mike Hinchey. Awareness in Software-intesive Systems. *IEEE Computer*, 45(12), December 2012.

[VH12b] Emil Vassev and Mike Hinchey. Efficient Reasoning with Ambient Trees for Space Exploration. In *Proceedings of the International Conference on Context-Aware Systems and Applications (ICCASA 2012)*, Lecture Notes of ICST (LNICST). Springer, 2012.

[VH12c] Emil Vassev and Mike Hinchey. Efficient Space Exploration through Laziness. In *Proceedings of the International Conference on Context-Aware Systems and Applications (ICCASA 2012)*, Lecture Notes of ICST (LNICST). Springer, 2012.

[VH12d] Emil Vassev and Mike Hinchey. Knowledge Representation for Cognitive Robotic Systems. In *Proceedings of the 15th IEEE International Symposium on Object/Component/Service-oriented Real-time Distributed Computing Workshops (ISCORCW 2012)*. IEEE Computer Society, 2012.

[VH12e] Emil Vassev and Mike Hinchey. Knowledge Representation with KnowLang - The marXbot Case Study. In *Proceedings of the 11th IEEE International Conference on Cybernetic Intelligent Systems*, pages 18–23. IEEE, 2012.

[VH13a] Emil Vassev and Mike Hinchey. Autonomy Requirements Engineering. *IEEE Computer*, 46(8):82–84, August 2013.

[VH13b] Emil Vassev and Mike Hinchey. Autonomy Requirements Engineering. In *Proceedings of the 14th IEEE International Conference on Information Reuse and Integration (IRI '13)*, 2013.

[VH13c] Emil Vassev and Mike Hinchey. Implementing Artificial Awareness with KnowLang. In *Proceedings of the IEEE International Systems Conference is Engineering of Complex Systems (SysCon 2013)*, 2013.

[VH13d] Emil Vassev and Mike Hinchey. Knowledge-Based Self-Adaptation. In *Proceedings of the 6th Latin-American Symposium on Dependable Computing (LADC 2013)*, 2013.

[VHG12] Emil Vassev, Mike Hinchey, and Benoit Gaudin. Knowledge Representation for Self-Adaptive Behavior. In *Proceedings of C* Conference on Computer Science & Software Engineering (C3S2E '12)*, pages 113–117. ACM, 2012.

[VHGN11] Emil Vassev, Mike Hinchey, Benoit Gaudin, and Patrick Nixon. Requirements and Initial Model for KnowLang - a Language for Knowledge Representation in Autonomic Service-Component Ensembles. In *C3S2E 2011: The Fourth International C* Conference on Computer Science & Software Engineering*, pages 35–42. ACM, 2011.

[WEMM12] Martin Wirsing, Jonas Eckhardt, Tobias Mülbauer, and José Meseguer. Design and Analysis of Cloud-Based Architectures with KLAIM and Maude. In *Proceedings of the 9th International Workshop on Rewriting Logic and its Applications (WRLA 2012)*, LNCS. Springer, 2012.

[WHKK11] Martin Wirsing, Matthias Hölzl, Annabelle Klarl, and Nora Koch. Engineering Autonomic Ensembles, December 2011. Awareness Magazine.

[ZBC+11] Franco Zambonelli, Nicola Bicocchi, Giacomo Cabri, Letizia Leonardi, and Mariachiara Puviani. On Self-adaptation, Self-expression, and Self-awareness in Autonomic Service Component Ensembles. In *2011 International Conference on Self-Adaptive and Self-Organizing Systems Workshops*, Ann Arbor (MC), October 2011. IEEE CS Press.

### 2.3.3 Publications Management System

Publications are managed in ASCENS by a password protected web application called PMI (Publications Management Interface), which is available under `http://pmi.ascens-ist.eu/`. The PMI has been developed by the LMU for a user friendly management of publications providing a user interface for input and search of publications as shown in Figure 4. It supports CRUD operations, simple and advanced search facilities, provides a set of Rich Internet Application (RIA) features, such as validation on the fly, and the generation of publication lists ordered by year, by author, and by type. The PMI is implemented in Ruby on Rails.

## 2.4 Presentations

The project members have presented ASCENS results at many events held in the period from 01.10.2010 to 30.9.2013. The following list includes 104 presentations that comprise tutorials, invited and keynote talks held during months 1 – 36 of the project. The table does not include – in order to avoid repetitions – presentations performed at conferences and workshops directly related to accepted papers listed in the previous section.

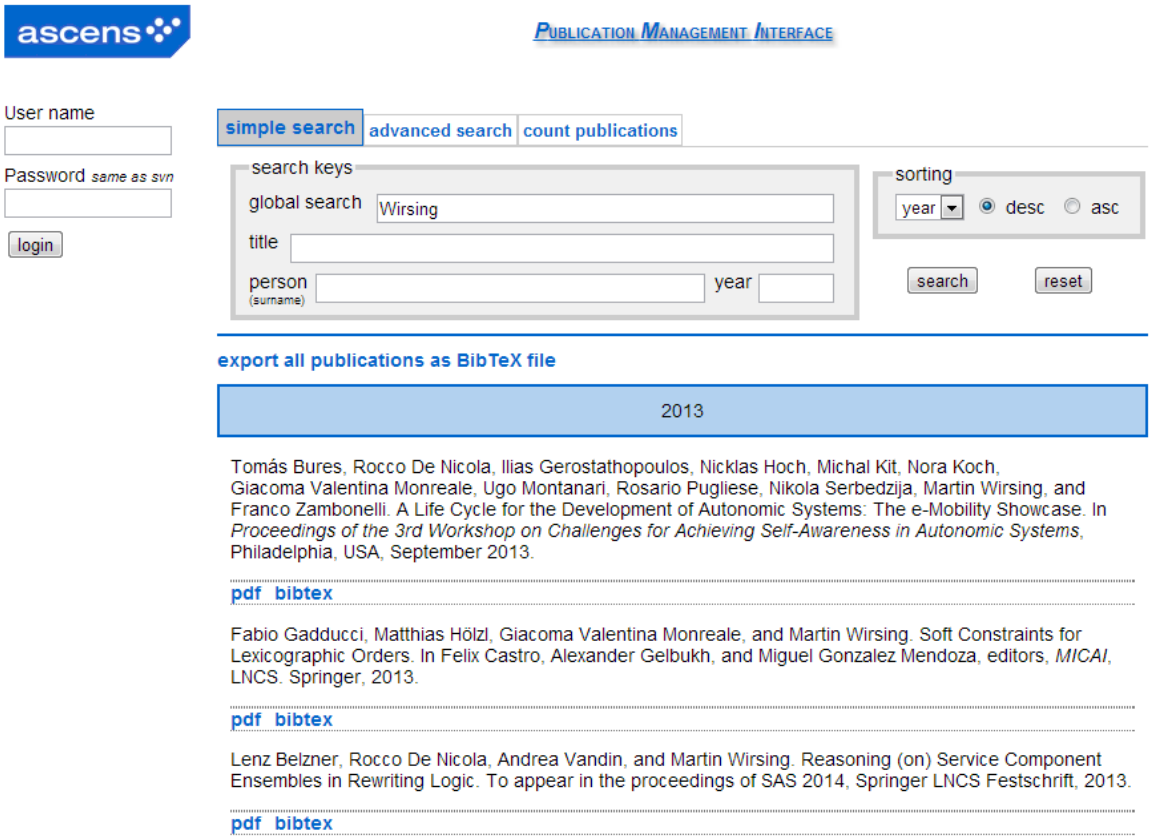



Figure 4: Publication Management Interface

| No. | Type of activities | Presenter | Title | Date | Place | Type of audience | Size | Countries |
|---|---|---|---|---|---|---|---|---|
| 1 | Invited Talk | Joseph Sifakis (Verimag) | Component-based Construction of Heterogeneous Real-time Systems in BIP | 22.11.2010 | ETH, Zurich, Switzerland | University | – | Italy |
| 2 | Seminar | Franco Zambonelli (UNIMORE) | Research Trends in Autonomic Computing and Communication | 16.12.2010 | Faculty of Engineering Enzo Ferrari, Modena, Italy | Master and PhD. students, Faculty | 30 | Italy |
| 3 | Invited Talk | Rocco De Nicola (IMT) | A Uniform Framework for Modeling Processes Behaviors and their Performances | 04.02.2011 | ICE'11 & PACO'11 at Reykjavik, Iceland | Workshop | 40 | all |
| 4 | Tutorial | Diego Latella (CNR-ISTI) | A Uniform Framework for the Definition of (Stochastic) Process Languages (Part I). | 04.02.2011 | MT-Lab Seminars, Lyngby, Copenhagen, Denmark | Faculty and PhD. students | 20 | all |
| 5 | Talk | Nora Koch (LMU) | Integration of Methodologies and Tools | 09.02.2011 | NESSoS Plenary Meeting, Madrid, Spain | NESSoS partners | 40 | all |
| 6 | Tutorial | Diego Latella (CNR-ISTI) | A Uniform Framework for the Definition of (Stochastic) Process Languages (Part II). | 11.02.2011 | MT-Lab Seminars, Lyngby, Copenhagen, Denmark | Faculty and PhD. students | 20 | all |
| 7 | Invited Talk | Ugo Montanari (UNIPI) | Logica e Modelli di Calcolo: Due Facce della Stessa Medaglia (in Italian) | 17.02.2011 | Info-Incontri Informatica, Dalla Logica Computazionale all' Intelligenza Artificiale, Fano, Italy | Series of Seminars | 80 | all |
| 8 | Invited Talk | Mieke Massink (CNR-ISTI) | A Process Algebraic Fluid Flow Model of Emergency Egress. | 18.02.2011 | MT-Lab Seminars, Lyngby, Copenhagen, Denmark | Faculty and PhD. students | 20 | all |
| 9 | Tutorial | Rolf Hennicker (LMU) | Large Simulations: The GLOWA-Danube Approach to Integrative Environmental Simulations | 22.02.2011 | Utrecht, the Netherlands | Master Students | 35 | Netherlands |

| No. | Type of activities | Presenter | Title | Date | Place | Type of audience | Size | Countries |
|---|---|---|---|---|---|---|---|---|
| 10 | Invited Talk | Mieke Massink (CNR-ISTI) | Modelling Crowd Dynamics in Bio-PEPA. | 25.02.2011 | MT-Lab Seminars, Lyngby, Copenhagen, Denmark | Faculty and PhD. students | 20 | all |
| 11 | Invited Talk | Mieke Massink (CNR-ISTI) | A formal fluid-flow approach to agent based models | 11.03.2011 | Model Based & Formal Verification Techniques, Pisa, Italy | Faculty and PhD. students | 40 | Italy |
| 12 | Keynote Talk | Rolf Hennicker (LMU) | Interface Coherence of Reactive Software Components: Solutions and Challenges | 02.04.2011 | FESCA'11, Saarbruecken, Germany | Workshop | 30 | all |
| 13 | Invited Talk | Nikola Serbedzija (Fraunhofer) | This Pervasive Day Exhibtion | 19.04.2011 | Science Festival, Edinburgh | Exhibition | 40 | Edingburgh, UK |
| 14 | Invited Talk | Lucia Acciai (UDF) | Spatial and Behavioural types: safety, liveness and decidability | 20.04.2011 | Faculdade de Ciencias e Tecnologia, Universidade Nova de Lisboa, Portugal | Workshop | 40 | all |
| 15 | Seminar | Emil Vassev (UL) | Knowledge Representation for Autonomous Systems – The ASCENS Case Study. | 02.05.2011 | Organic Computing – Design of Self-Organizing Systems (Dagstuhl Seminar 11181), Schloss Dagstuhl, Wadern, Germany | Workshop | 40 | all |
| 16 | Invited Talk | Ugo Montanari (UNIPI) | Ensambles Autonomici | 05.05.2011 | Aula Magna Facoltà di Scienze, Pisa, Italy | Internet Festival | 40 | all |
| 17 | Invited Talk | Nikola Serbedzija (Fraunhofer) | Heaven and Hell: Visions for Pervasive Adaptation | 05.05.2011 | FET'11, Budapest, Hungary | Special session | 30 | Hungary |
| 18 | Talk | Michele Boreale (DSIUF) | Quantitative Information Leakage, With a View | 24.05.2011 | Quantitative Modelling and Formal Analysis, Lucca, Italy | Workshop | 20 | all |
| 19 | Invited Talk | Michele Loreti (DSIUF) | A Uniform Framework for Process Models and Behavioral Equivalences of Nondeterministic, Probabilistic, or Stochastic Nature | 24.05.2011 | Quantitative Modelling and Formal Analysis, Lucca, Italy | Workshop | 20 | all |

| No. | Type of activities | Presenter | Title | Date | Place | Type of audience | Size | Countries |
|---|---|---|---|---|---|---|---|---|
| 20 | Invited Talk | Mieke Massink (CNR-ISTI) | Modelling Non-linear Crowd Dynamics in Bio-PEPA | 24.05.2011 | Quantitative Modelling and Formal Analysis, Lucca, Italy | Faculty and PhD. students | 20 | all |
| 21 | Invited Talk | Michele Boreale (UDF) | A survey on Quantitative Information Flow. | 24.05.2011 | Quantitative Modelling and Formal Analysis, Lucca, Italy | Faculty and PhD. students | 20 | all |
| 22 | Invited Talk | Stephan Reiter (LMU) | The ASCENS Science Cloud | 25.05.2011 | Working Group: Grid, Leibniz Supercomputing Centre, Munich, Germany | Staff and PhD. students | 10 | all |
| 23 | Invited Talk | Nikola Serbedzija (Fraunhofer) | Reflective Computing | 30.05.2011 | Véhicules et transports intelligents et communicants, Telecom ParisTech, Paris, France | Workshop | 80 | France |
| 24 | Seminar | Franco Zambonelli (UNIMORE) | The SAPERE and the ASCENS Projects | 31.05.2011 | Faculty of Engineering Reggio Emilia, Reggio Emilia, Italy | Master and PhD. students | 20 | Italy |
| 25 | Invited Talk | Joseph Sifakis (Verimag) | Embedded Systems Design – Challenges and Work Directions | May 2011 | IMT Institute for Advanced Studies, Lucca, Italy | University | – | Italy |
| 26 | Invited Talk | Ugo Montanari (UNIPI) | Un'Algebra di Connettori Per le Reti di Petri (in Italian) | 22.06.2011 | Università di Milano, Milano, Italy | Giornata in Onore di Gianni Degli Antoni | 100 | all |
| 27 | Invited Talk | Ugo Montanari (UNIPI) | Connector Algebras And Petri Nets | 30.06.2011 | Siberian Academy of Sciences, Akademgorodok, Novosibirsk, Russia | PSI'11, Ershov Informatics Conference | 80 | all |
| 28 | Workshop | Annabelle Klarl (LMU) | Hands-on Robots: Simulation with ARGoS | 10.07.2011 | PST Hut Seminar, Bayrischzell, Germany | Faculty and PhD. students | 15 | Germany |
| 29 | Workshop | Martin Wirsing (LMU) | Towards a System Model for Ensembles | 12.07.2011 | PST Hut Seminar, Bayrischzell, Germany | Faculty and PhD. students | 15 | Germany |
| 30 | Invited talk | Michele Boreale (UDF) | Quantitative Information Flow, with a View | 20.07.2011 | Trinity College, Dublin, Ireland | Faculty and PhD. students | 15 | Europe |
| 31 | Invited Talk | Bernd Werther (VW) | E-Mobility as a Challenge for New ICT Solutions in the Car Industry | 09.09.2011 | Trustworthy Global Computing, Aachen, Germany | Symposium | 50 | all |

| No. | Type of activities | Presenter | Title | Date | Place | Type of audience | Size | Countries |
|---|---|---|---|---|---|---|---|---|
| 32 | Invited Talk | Henry Bensler (VW) | Volkswagen und Elektromobilität | 09.09.2011 | Elektromobilität von morgen, Aachen, Germany | Symposium | 60 | Germany |
| 33 | Invited Talk | Matthias Hölzl (LMU) | Adaptation and Awareness in Ensembles | 09.09.2011 | Trustworthy Global Computing, Aachen, Germany | Symposium | 50 | all |
| 34 | Colloquium | Martin Wirsing (LMU) | Adaptation and Awareness in Ensembles | 12.09.2011 | IMDEA Software, Madrid, Spain | Faculty and PhD. students | 20 | Spain |
| 35 | Invited Talk | Michele Loreti (DSIUF) | Uniform Labeled Transition Systems for Nondeterministic, Probabilistic, and Stochastic Process Calculi | 19.09.2011 | PASTA'11, Ragusa, Italy | Workshop | 20 | all |
| 36 | Invited Talk | Mieke Massink (CNR-ISTI) | Fluid Analysis of Foraging Ants | 19.09.2011 | PASTA'11, Ragusa, Italy | Faculty and PhD. students | 20 | all |
| 37 | Invited Talk | Matthias Hölzl (LMU) | Research Challenges for Ensembles | 21.09.2011 | AWARENESS Steering Committee, Amsterdam, the Netherlands | Symposium | 20 | all |
| 38 | Invited Talk | Roberto Bruni (UNIPI) | Distributed Compensations with Interruptions in Long-Running Transactions | 21.09.2011 | Department of Computer Science, University of Leicester, Leicester, UK | Faculty and PhD. students | 20 | all |
| 39 | Invited Talk | Alberto Lluch Lafuente (IMT) | A Conceptual Framework for Behavioural Adaptation | 22.09.2011 | Department of Computer Science, University of Leicester, Leicester, UK | Faculty and PhD. students | 20 | all |
| 40 | Invited Talk | Ugo Montanari (UNIPI) | Component-Based Network Models | 23.09.2011 | IFIP WG 2.2, LIAFA, Université Paris Diderot, Pars, France | Seminar | 20 | all |
| 41 | Talk | Carlo Pinciroli (ULB) | The ARGoS simulator | 30.09.2011 | IROS2011, San Francisco, USA | IROS2011 | – | USA |
| 42 | Keynote talk | Joseph Sifakis (Verimag) | Rigorous System Design | 03.10.2011 | VLSI-SoC Conference, Hong Kong, China | Conference | – | all |
| 43 | Invited Talk | Matthias Hölzl (LMU) | Adaptation and Awareness in Ensembles | 04.10.2011 | Formal Methods for Components and Objects, Turin, Italy | Conference | 30 | all |

| No. | Type of activities | Presenter | Title | Date | Place | Type of audience | Size | Countries |
|---|---|---|---|---|---|---|---|---|
| 44 | Invited Talk | Rosario Pugliese (UDF) | SCEL: Service Component Ensemble Language | 04.10.2011 | Formal Methods for Components and Objects, Turin, Italy | Conference | 30 | all |
| 45 | Tutorial | Joseph Sifakis (Verimag) | Rigorous System Design in BIP | 09.10.2011 | Tutorial on Time-Predictable and Composable Architectures for Dependable Embedded Systems in Esweek, Taipeih, Taiwan | Conference | – | all |
| 46 | Tutorial | Rosario Pugliese (UDF) | SCEL: Service Component Ensemble Language | 28.10.2011 | Awareness Lecture Series | Awareness Virtual Lecture | – | all |
| 47 | Invited Talk | Stephan Reiter (LMU) | The ASCENS Science Cloud | 02.11.2011 | D3S Seminar, Charles University, Prague, Czech Republic | Faculty and PhD. students | 20 | all |
| 48 | Invited Talk | Ugo Montanari (UNIPI) | La Ricerca al Dipartimento di Informatica | 11.11.2011 | La CEP prima della CEP: storia dell'Informatica, La Limonaia, Pisa, Italy | Seminar | 40 | all |
| 49 | Invited Talk | Ugo Montanari (UNIPI) | Models and Languages for Service Component Ensembles | 18.11.2011 | Departamento de Computación, Buenos Aires, Argentina | Seminar | 40 | all |
| 50 | Invited Talk | Rolf Hennicker (LMU) | Modal Interface Theories | 15.12.2011 | Charles University, Prague, Czech Republic | University | 20 | Czech Republic |
| 51 | Invited Talk | Emil Vassev (UL) | Engineering Self-adaptive Systems – Challenges and Approaches | 17.01.2012 | Seminar at Concordia University , Montreal, Canada | 100 | – | Canada |
| 52 | Workshop Presentation | Gianluca Mezzetti (UNIPI) | Checking Security of Behavioural Variations | 03.02.2012 | COTICO Workshop, Lucca, Italy | Workshop | 40 | all |
| 53 | Workshop Presentation | Roberto Bruni (UNIPI) | Transactions Being Arranged | 03.02.2012 | COTICO Workshop, Lucca, Italy | Workshop | 40 | all |
| 54 | Invited Talk | Ugo Montanari (UNIPI) | Network Conscious pi-calculus | 09.02.2012 | Workshop on Nominal Sets meet Automata Theory, Warsaw, Poland | Seminar | 20 | all |

| No. | Type of activities | Presenter | Title | Date | Place | Type of audience | Size | Countries |
|---|---|---|---|---|---|---|---|---|
| 55 | Invited Talk | Rolf Hennicker (LMU) | Challenges and Solutions in Interface-Based Design of Component Systems | 25.03.2012 | FIT'12, Tallinn, Estonia | Workshop | 25 | all |
| 56 | Invited Talk | Martin Wirsing (LMU) | Algebraic Specifications: From Concurrent Systems to Clouds | 01.04.2012 | Symposium in honour of Egidio Astesiano, Genova, Italy | Symposium | 60 | all |
| 57 | Invited Talk | Franco Zambonelli and Marco Mamei (UNIMORE) | Toward Sociotechnical Urban Superorganisms | 15.05.2012 | IBM Smart Cities Center, Dublin, Ireland | Seminar | 40 | all |
| 58 | Invited Talk | Mirco Tribastone (LMU) | Performance Modelling of Large-Scale Hierarchical Systems | 22.05.2012 | GI-Dagstuhl Seminar, Schloss Dagstuhl, Wadern, Germany | Seminar | 30 | all |
| 59 | Seminar | Nikola Serbedzija (Fraunhofer) | Engineering Awareness | 22.05.2012 | 52. IFIP 2.4 Working Group Meeting, Vadstena, Sweden | Annual meeting | 30 | all |
| 60 | Invited Talk | Mirco Tribastone (LMU) | Performance Modeling of Design Patterns for Distributed Computation | 30.05.2012 | GI-Dagstuhl Seminar, Schloss Dagstuhl, Wadern, Germany | Seminar | 30 | all |
| 61 | Invited Talk | Alberto Lluch Lafuente (IMT) | A white-box perspective on Adaptation | 04.06.2012 | International Summer School on Self- Awareness in Autonomic Computing Systems (AWASS 2012) | Summer School | 40 | all |
| 62 | Invited Talk | Franco Zambonelli (UNIMORE) | Reconciling Self-adaptation and Self-organization | 05.06.2012 | 7th International Symposium on Software Engineering for Self-Managing and Adaptive Systems, Zurich Switzerland | Symposium | 100 | all |
| 63 | Invited Talk | Roberto Bruni (UNIPI) | Open Multiparty Interaction | 07.06.2012 | 21st International Workshop on Algebraic Development Techniques, Salamanca, Spain | Workshop | 50 | all |

| No. | Type of activities | Presenter | Title | Date | Place | Type of audience | Size | Countries |
|---|---|---|---|---|---|---|---|---|
| 64 | Seminar | Rolf Hennicker (LMU) | View-based development of a simulation framework for multi-disciplinary environmental modelling | 14.06.2012 | Salamanca, Spain | IFIP Working Group | 30 | all |
| 65 | Invited Talk | Rocco de Nicola (IMT) | A Language-based Approach to Autonomic Computing | 16.06.2012 | 8th International Workshop on Automated Specification and Verification of Web Systems, Stockholm, Sweden | Workshop | 20 | all |
| 66 | Talk | Matthias Hölzl and Annabelle Klarl (LMU) | The POEM Language | 18.06.2012 | PST Hut Seminar, Bayrischzell, Germany | Faculty and PhD. students | 20 | Germany |
| 67 | Talk | Christian Kroiß (LMU) | Adaptive Runtime-Verification In Multi Agent Systems | 18.06.2012 | PST Hut Seminar, Bayrischzell, Germany | Faculty and PhD. students | 20 | Germany |
| 68 | Talk | Martin Wirsing (LMU) | The ASCENS Approach | 19.06.2012 | PST Hut Seminar, Bayrischzell, Germany | Faculty and PhD. students | 20 | Germany |
| 69 | Seminar | Diego Latella (ISTI) | Bisimulation of State-to-Function Labeled Transition Systems of Stochastic Process Languages | 07.09.2012 | PEPA Club Talks, LFCS – University of Edinburgh, Edinburgh, UK | Faculty and Ph.D. students | 15 | all |
| 70 | Seminar | Roberto Bruni (UNIPI) | Open Multiparty Interactions in the link-calculus | 12.09.2012 | IMT Seminar series, Lucca, Italy | Faculty and PhD. students | 10 | all |
| 71 | Talk | Nora Koch (LMU) | Model-Driven Development of Access Control Policies | 12.09.2012 | NESSoS NoE Meeting, Pisa, Italy | NESSoS partners | 15 | all |
| 72 | Invited Talk | Ugo Montanari (UNIPI) | On hierarchical graphs: reconciling bigraphs, gs-monoidal theories and gs-graphs | 20.09.2012 | ICTCS 2012, 13th Italian Conference on Theoretical Computer Science, Varese, Italy | Conference | 50 | all |

| No. | Type of activities | Presenter | Title | Date | Place | Type of audience | Size | Countries |
|---|---|---|---|---|---|---|---|---|
| 73 | Invited Talk | Ugo Montanari (UNIPI) | Il Consorzio Interuniversitario Nazionale per l'Informatica: Presente e Futuro | 21.09.2012 | Colloquium Ticinense in Honor of Ivo De Lotto, Pavia, Italy | Colloquium | – | Italy |
| 74 | Invited Talk | Gian Luigi Ferrari (UNIPI) | Surveillance: data secrecy and Privacy. | 25.09.2012 | International Workshop on SURVEILLING and SURVEILLANCE, Florence, Italy | Workshop | – | all |
| 75 | Invited Talk | Martin Wirsing (LMU) | Softwaretechnik First | 29.09.2012 | Symposium in honour of Stefan Jähnichen, Berlin, Germany | Symposium | 120 | all |
| 76 | Invited Talk | Martin Wirsing (LMU) | Observations and Specifications | 09.11.2012 | Symposium in honour of Rolf Hennicker, München, Germany | Symposium | 70 | all |
| 77 | Invited Talk | Michele Boreale (DSIUF) | Worst- and average-case privacy breaches in randomization mechanisms | 28.11.2012 | Dagstuhl Seminar Series, Germany | Seminar | 40 | all |
| 78 | Invited Talk | Franco Zambonelli (UNIMORE) | Bio-inspired Solutions for Engineering Large-scale Urban Systems | 10.12.2012 | BIONETICS Conference, Lugano, CH | Conference | 60 | all |
| 79 | Invited Talk | Giacomo Cabri (UNIMORE) | Approaches to Engineer Interactions between Distributed Components | 10.01.2013 | 7th International Conference on Computer Engineering And Applications, Milano, I | Conference | 50 | all |
| 80 | Seminar | Rolf Hennicker (LMU) | Component-Interfaces with Contracts on Ports | 22.01.2013 | Erlangen, Germany | University | 20 | all |
| 81 | Seminar | Michele Boreale (DSIUF) | Quantitative Models of Confidentiality and Privacy | 22.01.2013 | DiSIA seminar, University of Firenze | Seminar | 50 | Italy |
| 82 | Workshop | Roberto Bruni, Fabio Gadducci (UNIPI) | Kick-off meeting of Italian MIUR Project CINA | 04.02.2013 | Pisa, Italy | University | 60 | Italy |

| No. | Type of activities | Presenter | Title | Date | Place | Type of audience | Size | Countries |
|---|---|---|---|---|---|---|---|---|
| 83 | Presentation | Ugo Montanari (UNIPI) | Constraints for service contracts | 04.02.2013 | Kick-off meeting of Italian MIUR Project CINA, Pisa, Italy | University | 60 | Italy |
| 84 | Presentation | Andrea Corradini (UNIPI) | Applying Process Analysis to the Italian eGovernment Enterprise Architecture | 05.02.2013 | Kick-off meeting of Italian MIUR Project CINA, Pisa, Italy | University | 60 | Italy |
| 85 | Talk | Michele Boreale (DSIUF) | Introduction to Quantitative Information Flow (QIF) | 05.02.2013 | CINA Kickoff Meeting, University of Pisa, Italy | Project meeting | 40 | Italy |
| 86 | Presentation | Roberto Bruni (UNIPI) | From static to dynamic connectors | 06.02.2013 | Kick-off meeting of Italian MIUR Project CINA, Pisa, Italy | University | 60 | Italy |
| 87 | Seminar | Rolf Hennicker (LMU) | Component-Interfaces with Contracts on Ports: Meta-Theory and Instantiation | 16.03.2013 | Rome, Italy | IFIP Working Group | 30 | all |
| 88 | Invited Talk | Ugo Montanari (UNIPI) | Indexing processes with computational resources | 17.03.2013 | ACCAT'13 Workshop, Rome, Italy | Researchers | – | all |
| 89 | Tutorial | Nikola Serbedzija (Fraunhofer) | Service Components and Ensembles: Building Blocks for Autonomous Systems | 24.03.2013 | Lisboa, Portugal | ICAS 2013 | 20 | all |
| 90 | Panel | Nikola Serbedzija (Fraunhofer) | How Much Autonomous can be the Autonomous Systems? From Dreams to Facts | 24.03.2013 | Lisboa, Portugal | ICAS 2013 | 40 | all |
| 91 | Invited Talk | Ugo Montanari (UNIPI) | A network-conscious pi-calculus and its coalgebraic semantics | 01.06.2013 | Glynn Fest Workshop, Cambridge, UK | Researchers | – | all |
| 92 | Talk | Fabio Gadducci (UNIPI) | Enriching the flexibility of soft constraints formalisms | 10.06.2013 | Lix, École Polytechnique | Faculty and PhD. students | 25 | all |
| 93 | Workshop | Martin Wirsing (LMU) | Introduction to the Formal Engineering of Autonomic Systems | 18.06.2013 | PST Hut Seminar, Bayrischzell, Germany | Faculty and PhD. students | 20 | Germany, Italy |

| No. | Type of activities | Presenter | Title | Date | Place | Type of audience | Size | Countries |
|---|---|---|---|---|---|---|---|---|
| 94 | Workshop | Annabelle Klarl (LMU) | Towards Task-Driven Ensemble Modeling | 18.06.2013 | PST Hut Seminar, Bayrischzell, Germany | Faculty and PhD. students | 20 | Germany, Italy |
| 95 | Workshop | Lenz Belzner (LMU) | Action Programming in Rewriting Logic | 18.06.2013 | PST Hut Seminar, Bayrischzell, Germany | Faculty and PhD. students | 20 | Germany, Italy |
| 96 | Summer School | Martin Wirsing (LMU) | ASCENS: Towards Systematically Engineering Ensembles | 24.06.2013 | Awareness Summer School, Lucca, Italy | PhD. students | 40 | all |
| 97 | Invited Talk | Franco Zambonelli (UNIMORE) | Collective Awareness and Action in Urban Superorganisms | 03.07.2013 | Platforme Francofone d'Intelligence Artificielle, Lille, F | Conference | 160 | France |
| 98 | Invited Talk | Rolf Hennicker (LMU) | Component-Interfaces with Contracts on Ports: Meta-Theory and Instantiation | 09.07.2013 | Aveiro, Portugal | Mondrian Workshop | 30 | Portugal |
| 99 | Talk | Fabio Gadducci (UNIPI) | Bisimulations from graphical encodings | 12.07.2013 | Institut Galilée, Université Paris 13 | Faculty and PhD. students | 10 | all |
| 100 | Seminar | Carlo Pinciroli (ULB) | ARGoS: Large-Scale Physics-Based Simulation of Swarm Robotics Systems | 19.08.2013 | Argonne National Laboratory, IL, USA | Researchers | 40 | all |
| 101 | Invited Talk | Franco Zambonelli (UNIMORE) | Engineering Urban Superorganisms | 17.09.2013 | Conference of the Academia Europaea, Worclaw, Polans | Conference | 80 | all |
| 102 | Invited Talk | Ugo Montanari (UNIPI) | Software Engineering: new challenges, some solutions | 20.09.2013 | Knowledge Acceleration and ICT, Pisa, Italy | Computer Science Dept., Informatics Eng. Dept and local companies | 100 | Italy |
| 103 | Invited Talk | Michele Boreale (DSIUF) | An introduction to Quantitative Information Flow (QIF) | 24.09.2013 | IFIP WG 2.2 | IFIP meeting | 30 | all |
| 104 | Invited Talk | Marius Bozga (UJF-Verimag) | Modeling Heterogeneous Real-Time Components in BIP (revisited) | 25.09.2013 | SEFM 2013, Madrid, Spain | Conference | 30 | all |

## 2.5 Organization of Events

ASCENS members participated in the organization of 47 conferences and workshops in different roles, such as chairs of the event, Program Committee (PC) or Steering Committee (SC) members.

The list presented below is limited to events in which ASCENS partners participated actively in the roles of PC chairs, SC members or organizers. Events in which ASCENS partners only acted in the role of PC members are not included, as this would lead to an unduly long table with hundreds of entries. In addition to the event name, the type and size of the audience is provided as additional information. All the events addressed participants of all countries.

An increasing number of international conferences welcome the organization of satellite events that focus on aspects that are more specific than the topics of the conference, as a means to maximize interaction between participants and to give visibility to emerging areas with clear impact on science and technology. ASCENS members seized this opportunity by collocating some of the organized workshops with major conferences, such as GT-VMT at ETAPS 2011, ICE at DisCoTec'11, as well as FIT, QAPL and GRAPHite at ETAPS 2012, and MDsec at MoDELS 2012.

### 2.5.1 Conferences

- Joint 15th IFIP International Conference on Formal Methods for Open Object-based Distributed Systems and 31th IFIP International Conference on FORmal TEchniques for Networked and Distributed Systems (FMOODS-FORTE 2013), 3 – 5 June 2013, Florence (Italy), Faculty and Ph.D. Students, all countries, DSIUF, Michele Boreale, PC chair

- Joint 13th IFIP International Conference on Formal Methods for Open Object-based Distributed Systems and 31th IFIP International Conference on FORmal TEchniques for Networked and Distributed Systems (FMOODS-FORTE 2011), 6 – 9 June 2011, Reykjavik (Iceland), Faculty and Ph.D. Students, 40, all countries, UNIPI, Roberto Bruni

- 20th European Conference on Artificial Life (ECAL), 8 – 12 August 2011, Paris (France), Faculty and Ph.D. Students, 500, all countries, ULB, Marco Dorigo

- 4th Conference on Algebra and Coalgebra in Computer Science (CALCO 2011), 30 August – 02 September 2011, Winchester (UK), Faculty and Ph.D. Students, 70, all countries, UNIPI, Andrea Corradini & Ugo Montanari.

- International Colloquium on Theoretical Aspects of Computing 2011 (ICTAC 2011), 31 August 31 – 02 September 2011, Johannesburg (South Africa), Faculty and Ph.D. Students, 100, all countries, ISTI, Mieke Massink (PC member)

- 6th International Symposium on Trustworthy Global Computing (TGC 2011), 9 – 10 September 2011, Aachen (Germany), Faculty and Ph.D. Students, 30, all countries, UNIPI, Roberto Bruni

- 9th International Conference on Integrated Formal Methods, 18 – 22 June 2012, Pisa (Italy), Faculty and Ph.D. Students, 100, all countries, ISTI, Diego Latella (PC Co-Chair)

- 4th ACM SIGCHI Symposium on Engineering Interactive Computing Systems (EICS 2012), Copenhagen (Denmark), 25 – 28 June 2012, Faculty and Ph.D. Students, 200, all countries, ISTI, Mieke Massink (PC Member)

- ANTS 2012: Eight International Conference on Swarm Intelligence, 12 – 14 September 2012, Brussels (Belgium), Faculty and Ph.D. Students, 100, all countries, ULB, Marco Dorigo (general chair).

- 10th International Conference on Integrated Formal Methods, 10 – 14 June 2013, Turku (Finland), Faculty and Ph.D. Students, 100, all countries, ISTI, Diego Latella (PC Member)
- 5th ACM SIGCHI Symposium on Engineering Interactive Computing Systems (EICS 2013), London (UK), 24 – 27 June 2013, Faculty and Ph.D. Students, 200, all countries, ISTI, Mieke Massink (PC Member)
- First International Conference on Context-Aware Systems and Applications (ICCASA 2012), 26 – 27 November 2012, Ho Chi Minh City (Vietnam), 200, all countries, UL, Emil Vassev (steering).
- 4th ACM/SPEC International Conference on Performance Engineering, 21 – 24 April 2013, Prague, (Czech Republic), Faculty and Ph.D. students, 160, all countries, CUNI, Petr Tuma (General co-chair)
- 15th International Conference on Coordination Models ad Languages (COORDINATION 2013), Firenze (IT), 3 – 5 June 2013, Faculty and Ph.D. Students, 30, all countries, ISTI/UDF, Mieke Massink (PC Member) and Rosario Pugliese (PC Member)
- Joint 15th IFIP International Conference on Formal Methods for Open Object-based Distributed Systems and 33rd IFIP International Conference on FORmal TEchniques for Networked and Distributed Systems (FMOODS-FORTE 2013), 3 – 5 June 2013, Florence (Italy), Faculty and Ph.D. Students, 40, all countries, Michele Boreale, DSIUF, PC co-chair
- 8th International Federeted Conference on Distributed Computing Techniques (DisCoTec2013), Firenze (IT), 3 – 6 June 2013, Faculty and Ph.D. Students, 120, all countries, UDF, Michele Loreti (General Chair), Rosario Pugliese (Publicity Chair)
- 10th International Conference on Integrated Formal Methods, 10 – 14 June 2013, Turku (Finland), Faculty and Ph.D. Students, 100, all countries, ISTI/UDF, Diego Latella (PC Member) and Michele Loreti (PC Member)
- 5th ACM SIGCHI Symposium on Engineering Interactive Computing Systems (EICS 2013), London (UK), 24 – 27 June 2013, Faculty and Ph.D. Students, 200, all countries, ISTI, Mieke Massink (PC Member)
- 8th Symposium on Trustworthy Global Computing (TGC 2013) – August 2013, Argentina, Faculty and Ph.D. Students, 40, all countries, IMT, Alberto Lluch Lafuente (co-chair)
- 7th International Conference on Self-adaptive and Self-organizing Systems (SASO 2013), Philadelphia (USA), 9-13 September 2013, Faculty and Ph.D. Students, 120, all countries, UNIMORE, Franco Zambonelli (Steering Committee Member)
- 28-esimo Convegno Italiano di Logica Computazionale (CILC 2013), Catania, 25 – 27 September 2013, Faculty and Ph.D. Students, 40, all countries, IMT, Valerio Senni (PC member)
- 10th International Symposium on Formal Aspects of Component Software (FACS 2013) – October 2013, Nanchang, China, Faculty and Ph.D. Students, 40, all countries, UNIPI, Roberto Bruni (PC member)
- Foundations of Software Technology and Theoretical Computer Science (FSTTCS 2013) – December 2013, IIT Guwahati, India, Faculty and Ph.D. Students, 60, all countries, UNIPI, Roberto Bruni (PC member)

- The European Joint Conferences on Theory and Practice of Software (ETAPS), Grenoble (France), 5 – 13 April 2014, Faculty and Ph.D. Students, 400, all countries, UJF-Verimag, Saddek Bensalem (Organizer)
- 17th International Conference on Fundamental Approaches to Software Engineering (FASE), Grenoble (F), 5 – 14 April 2014, Faculty and Ph.D. Students, 50, all countries, ISTI/UDF, Mieke Massink (PC Member) and Rosario Pugliese (PC Member)
- 20th International Conference on Tools and Algorithms for the Construction and Analysis of Systems (TACAS), Grenoble (F), 5 – 14 April 2014, Faculty and Ph.D. Students, 50, all countries, UJF-Verimag, Saddek Bensalem (PC Member)
- 39th International Symposium on Mathematical Foundations of Computer Science (MFCS 2014) – August 2014, Italy, Faculty and Ph.D. Students, 100, all countries, UNIPI, Fabio Gadducci (PC member)
- 25th International Conference on Concurrency Theory (CONCUR 2014) – September 2014, Italy, Faculty and Ph.D. Students, 100, all countries, UNIPI, Fabio Gadducci (PC member)

### 2.5.2 Workshops

- Workshop on Foundations and Applications of Component-based Design (WFCD in ESWeek), 24 October 2010, Scottsdale (Arizona, USA), University and Industry, 39, all countries, Verimag, Jacques Combaz & Joseph Sifakis
- Ninth Workshop on Quantitative Aspects of Programming Languages (QAPL 2011), 1 – 3 April 2011, Saarbrücken (Germany), International, 30, all countries, ISTI, Mieke Massink (PC Co-Chair)
- 10th International Workshop on Graph Transformation and Visual Modelling Techniques (GT-VMT 2011), 2 – 3 April 2011, Saarbrücken (Germany), Faculty and Ph.D. Students, 40, all countries, UNIPI, Fabio Gadducci
- 7th International Workshop on Automated Specification and Verification of Web Systems (WWV 2011), 9 June 2011, Reykjavik (Iceland), International, 15, all countries, UDF/IMT, Rosario Pugliese (Program chair) and Francesco Tiezzi (Program chair)
- 4th Interaction and Concurrency Experience (ICE 2011), 9 June 2011, Reykjavik (Iceland), Faculty and Ph.D. Students, 25, all countries, UNIPI, Roberto Bruni
- Third Annual Meeting and Workshop of the Models and Logics for Quantitative Analysis ERCIM WG (MLQA 2011), 5 September 2011, Aachen (Germany), International, 30, all countries, ISTI, Diego Latella.
- 1st SASO Workshop on Self-awareness in Autonomic Systems (AWARE2011), 7 October 2011, Ann Arbor (Michigan, USA), International, 30, all countries, UNIMORE, Giacomo Cabri (Workshop chair)
- Fourth International Workshop on Foundations of Interface Technologies (FIT 2012), 25 March 2012, Tallin (Estonia), International, 30, all countries, LMU, Sebastian Bauer
- Tenth Workshop on Quantitative Aspects of Programming Languages (QAPL 2012), 31 March – 1 April 2012, Tallin (Estonia), International, 30, all countries, ISTI, Mieke Massink (PC Co-Chair)

- 1st Workshop on Graph Inspection and Traversal Engineering (GRAPHite 2012), 1 April 2012, Tallin (Estonia), International, 30, all countries, IMT, Alberto Lluch Lafuente (PC member)
- 5th Interaction and Concurrency Experience (ICE 2012), 16 June 2012, Stockholm (Sweden), Faculty and Ph.D. Students, 25, all countries, UNIPI/IMT, Roberto Bruni (PC member), Alberto Lluch Lafuente (PC member) and Francesco Tiezzi (PC Member)
- 8th International Workshop on Automated Specification and Verification of Web Systems (WWV 2012), 16 June 2012, Stockholm (Sweden), International, 20, all countries, IMT/UDF, Francesco Tiezzi (Program chair) and Rosario Pugliese (PC member)
- First International Workshop on Formal Methods for Self-Adaptive Systems (FMSAS 2012), 27 – 28 June 2012, Montreal (QC, Canada), International, 20, all countries, UL, Emil Vassev (chair), Mike Hinchey (steering)
- 8th Model-Driven and Agile Engineering for the Web (MDWE 2012), 25 July 2012, Berlin (Germany), International, 30, all countries, LMU, Nora Koch
- 3rd Workshop on the Web and Requirements Engineering (WeRE 2012), 27 July 2012, Berlin (Germany), International, 20, all countries, LMU, Nora Koch
- 17th International Workshop on Formal Methods for Industrial Critical Systems (FMICS2012), 27 – 28 August 2012, Paris (France), International, 30, all countries, ISTI, Mieke Massink (PC Member)
- 2nd SASO Workshop on Self-awareness in Autonomic Systems (AWARE2012), 10 September 2012, Lyon (France), International, 20, all countries, UNIMORE, Franco Zambonelli & Giacomo Cabri (Workshop chair)
- 6th International Symposium on Trustworthy Global Computing (TGC 2012), 7 – 8 September 2012, Newcastle (UK), International, 30, all countries, IMT/UNIPI/LMU, Martin Wirsing (steering), Ugo Montanari (steering), Rocco De Nicola (steering), Roberto Bruni (PC member) and Alberto Lluch Lafuente (PC member)
- First Model-Driven Security Workshop (MDsec 2012) at MoDELS 2012 conference, 1st October 2012, Innsbruck (Austria), International, 30, all countries, LMU, Nora Koch

## 2.6 Summer Schools

ASCENS members actively participated in the organization of the AWARENESS schools. On the one hand many lecturers of the AWARENESS Virtual Lecture Series (AVLS) were ASCENS members. On the other hand senior researchers of ASCENS organized the AWARENESS summer school held in Edinburgh, UK (AWASS 2012), and AWASS 2013, held in Lucca, Italy, which was attended among others by several ASCENS PhD students.

- Artist Summer School Europe 2011, 04 – 09 Sept 2011, Aix-les-Bains (France), University and Ph.D. students, 87, all countries, Verimag, Jacques Combaz
- Awareness Virtual Lecture Series (AVLS), all countries, LMU, UDF, UNIMORE, IMT, including the following lectures of ASCENS members:
  - SCEL: Service Component Ensemble Language - Rosario Pugliese (October 28, 2011)

  - Self-aware Pervasive Service Ecosystems - Franco Zambonelli (November 11, 2011)
  - Adaptation and Awareness in Robot Ensembles - Matthias Hölzl (November 25, 2011)

- Awareness Summer School (AWASS 2012), 10 – 16 June 2012, Edinburgh (UK), PhD Students, 30, all countries, IMT, Andrea Vandin, Alberto Lluch
- Nano-Tera/Artist Summer School Europe 2012, 17 – 21 September 2012, Aix-les-Bains (France), University and Ph.D. students, 64, all countries, Verimag, Jacques Combaz
- Awareness Summer School (AWASS 2013), 24 – 28 June 2013, Lucca (Italy), PhD Students, 30, all countries, UDF, Michele Loreti (teacher), Andrea Vandin, Alberto Lluch Lafuente (organizers), LMU Martin Wirsing (invited speaker), Matthias Hölzl (teacher).
- Summer School on Cyber-Physical Systems 2013, 08 – 12 July 2013, Grenoble (France), University and Ph.D. students, 70, all countries, Verimag, Saddek Bensalem (organizer)

## 2.7 Courses

During the first three reporting years, the academia partners taught ASCENS-related topics in several courses. The list below includes 39 graduate and postgraduate courses and tutorials. Some of them were taught in more than one term. The list provides name of the courses, type and size of the audiences (if available), location, members that were responsible for the course and the acronym of the partner.

- Distributed Systems and Computer Networks, Autumn 2010, Università di Firenze (Italy), master students, 10, UDF, Rosario Pugliese and Francesco Tiezzi.
- Modellierung dynamischer und adaptiver Systeme, Winter Term 2010/11, Ludwig-Maximilians-Universität München (Germany), master and diploma students, 10, LMU, Martin Wirsing and Wolfgang Hesse.
- Models of Computation, Spring 2011, Università di Pisa (Italy), graduate students, 50, UNIPI, Ugo Montanari.
- Semantica e Teoria dei Tipi (in Italian), Spring 2011, University of Pisa and Scuola Normale (Italy), graduate and PhD students, 10, UNIPI, Ugo Montanari.
- Elements of Computability Theory, Spring 2011, IMT (Italy), PhD students, 10, UNIPI, Ugo Montanari.
- Concurrency Models, Spring 2011, IMT (Italy), PhD students, 10, UNIPI, Ugo Montanari.
- Formal Methods for Security Policies and Protocols, Spring 2011, Università di Pisa (Italy), master students, 15, UNIPI, Fabio Gadducci.
- Methods for the Specification and Verification of Business Processes, Spring 2011, Università di Pisa (Italy), master students, 23, UNIPI, Roberto Bruni.
- Formal Methods for Concurrent System, Spring 2011, IMT (Italy), PhD students, 7, UNIPI and IMT, Roberto Bruni and Rocco De Nicola.
- Probabilistic and Stochastic Methods in Process Algebras, Spring 2011, IMT (Italy), PhD students, IMT, Rocco De Nicola.

- Software Verification Methods, Spring 2011, Università di Pisa (Italy), master students, 5, UNIPI, Andrea Corradini and Gianluigi Ferrari.
- Techniques for System Verification and Evaluation, Spring 2011, Università di Firenze (Italy), undergraduate students, 10, ISTI, Mieke Massink.
- Swarm Intelligence INFO-H-414, Spring 2010-2012, Université; Libre de Bruxelles (Belgium), undergraduate students, 20, IRIDIA-ULB, Marco Dorigo, Mauro Birattari, Carlo Pinciroli
- Software and Service Engineering, Spring 2011, 2012, and 2013, Università di Modena e Reggio Emilia (Italy), undergraduate students, 25, UNIMORE, Franco Zambonelli.
- Distributed Software Systems, Autumn 2011 and 2012, Università di Modena e Reggio Emilia (Italy), undergraduate students, 20, UNIMORE, Franco Zambonelli and Giacomo Cabri.
- Formal Methods for Specification and Validation, Autumn 2011, IMT Lucca, PhD students, UNIPI, Gianluigi Ferrari.
- Methods for the Specification and Verification of Business Processes, Autumn 2011, Università di Pisa (Italy), master students, 20, UNIPI, Roberto Bruni.
- Distributed Systems and Computer Networks, Autumn 2011, Università di Firenze (Italy), master students, 10, UDF, Rosario Pugliese and Francesco Tiezzi.
- Interpreters and Compilers, Autumn 2011, Università di Firenze (Italy), master students, 10, UDF, Rosario Pugliese and Francesco Tiezzi.
- Simulation with ARGoS, Spring 2011, Ludwig-Maximilians-Universit\"at München (Germany), students and PhD students, 7, LMU, Annabelle Klarl
- Program Analysis and Code Verification, Autumn 2011, CUNI (Czech Republic), master students, 13, CUNI, Jan Kofron.
- System Behavior Models and Verification, Spring 2012, CUNI (Czech Republic), master students, 20, CUNI, Jan Kofron.
- Modellierung dynamischer und adaptiver Systeme, Winter Term 2011/12, Ludwig-Maximilians-Universität München (Germany), bachelor, master and diploma students, 17, LMU, Martin Wirsing and Wolfgang Hesse.
- Adaptive Agenten, Summer Term 2012, Ludwig-Maximilians-Universität München (Germany), bachelor students, 18, LMU, Martin Wirsing, Andreas Schroeder, Annabelle Klarl, Christian Kroiś, Lenz Belzner.
- Formal Methods for System Verification, Winter term 2012/13, Università di Firenze (Italy), undergraduate students, 10, UDF, Michele Loreti, ISTI, Mieke Massink.
- Principles of Concurrent and Distributed Programming, Winter term 2012/13, IMT (Italy), PhD students, IMT, Rocco De Nicola
- Software Engineering and Service Oriented Systems, September/October 2012, IMT (Italy), PhD students, 6, IMT/LMU, Francesco Tiezzi, Martin Wirsing.
- Models of Sequential and Concurrent Systems, Winter term 2012/13, Universita' di Firenze(Italy), master students, 10, UDF, Rosario Pugliese.

- Modellierung dynamischer und adaptiver Systeme, Winter Term 2012/13, Ludwig-Maximilians-Universität München (Germany), bachelor, master and diploma students, 12, LMU, Martin Wirsing and Wolfgang Hesse.
- Software Verification Methods, Spring 2013, University of Pisa (Italy), master students, 5, UNIPI, Andrea Corradini.
- Formal Methods in Computer Science, April 2013, IMT (Italy), PhD students, 8, IMT, Valerio Senni, Francesco Tiezzi.
- Formale Techniken in der Software-Entwicklung, Summer Term 2013, Ludwig-Maximilians-Universität München (Germany), bachelor, master and diploma students, 6, LMU, Rocco De Nicola.
- Performance Modelling of Computer Systems, Summer Term 2013, Ludwig-Maximilians-Universität München (Germany), bachelor, master and diploma students, 12, LMU, Mirco Tribastone.
- Seminar Engineering Intelligent Distributed Systems, Summer Term 2013, Ludwig-Maximilians-Universität München (Germany), bachelor, master and diploma students, 17, LMU, Matthias Hölzl, Martin Wirsing, Lenz Belzner, Annabelle Klarl, Christian Kroiß.
- Software Engineering and Service Oriented Systems, September 2013, IMT (Italy), PhD students, 6, IMT/LMU, Francesco Tiezzi, Martin Wirsing.
- Modellierung dynamischer und adaptiver Systeme, Winter Term 2013/14, Ludwig-Maximilians-Universität München (Germany), bachelor, master and diploma students, 14, LMU, Martin Wirsing and Wolfgang Hesse.
- Formal Methods for System Verification, Winter term 2013/14, Universita' di Firenze (Italy), undergraduate students, 10, UDF, Michele Loreti, ISTI, Mieke Massink.
- Models of Sequential and Concurrent Systems, Winter term 2013/14, Universita' di Firenze (Italy), master students, 12, UDF, Rosario Pugliese.
- System behavior models and verification, Spring 2013/14, CUNI (Czech Republic), master students, 20, CUNI, Jan Kofron.

## 2.8 Distribution of Software Products

Within the scope of ASCENS, first prototypes were built or existing software tools developed in previous projects were adapted during the first 36 months of the project. The objective is the construction of demonstrators of the technologies that have been developed by the members of the ASCENS consortium. The final aim is to integrate these software tools in the Service Development Environment (SDE), which provides a tool integration platform enabling this way the combined use of tools, i.e. the construction of so-called tool chains.

The following table provides an overview on these ASCENS relevant tools. It includes only a brief description of them; for further details please refer to the deliverable(s) mentioned in the last column of the table.

| Acronym | Software name | Description | License | Partner | Contact | URL | Deliverable |
|---|---|---|---|---|---|---|---|
| ARGoS | Autonomous Robots Go Swarming | ARGoS is a software designed to prototype robot control code for large heterogeneous swarms of robots | GPL | ULB | Carlo Pinciroli | http://iridia.ulb.ac.be/argos, https://github.com/ilpincy/argos3 | D6.3<br>D7.3<br>JD3.1<br>JD3.2 |
| ARGoS-Lua | ARGoS-Lua | The ARGoS-Lua library allows users to program controllers for ARGoS in Lua instead of C++ | MIT | ULB | Carlo Pinciroli | http://github.com/ilpincy/argos3 | JD3.2 |
| ARGoS-MultiVeStA | ARGoS-MultiVeStA | A wrapper between ARGoS and the MultiVeStA distributed statistical analyzer. | MIT | ULB, IMT | Carlo Pinciroli, Andrea Vandin | http://github.com/ilpincy/argos3-multivesta | D6.3 |
| BIP Compilers | BIP Compiler | The BIP compiler suite compiles models before submitting them to backends for code generation. | GNU | Verimag | Jacques Combaz | http://www-verimag.imag.fr/New-BIP-tools.html | D5.3<br>D7.3<br>JD3.1<br>JD3.2 |
| BIP D-Finder | Verification tool | The tool verifies safety properties of systems specified in BIP. | GNU | Verimag | Jacques Combaz | http://www-verimag.imag.fr/DFinder.html | D5.3<br>JD3.2 |
| FACPL | Formal Access Control Policy Language | A formal language for developing access control policies with an easily syntax and useful developing tools. | Eclipse Public License (EPL) v1.0 | Verimag | Andrea Margheri | http://rap.dsi.unifi.it/facpl | D1.3<br>D6.3<br>JD3.1 |
| GMC | Gimple Model Checker | GMC is an explicit state model checker for C and C++ languages | LGPL | CUNI | Jan Kofroň | http://d3s.mff.cuni.cz/~sery/gmc/ | D6.3 |

| Acronym | Software name | Description | License | Partner | Contact | URL | Deliverable |
|---|---|---|---|---|---|---|---|
| Helena Framework | Handling massively distributed systems with ELaborate ENsemble Architecture | Helena is a framework for running ensembles modeled around the notion of roles. | | LMU | Annabelle Klarl, Rolf Hennicker | http://www.pst.ifi.lmu.de/Personen/team/klarl/papers/helena.jar | D6.3 JD3.2 |
| HL-SCEL | High Level Language for SCEL Ensembles | A compiler that starting from a HL-SCEL program generates jRESP code. | Eclipse Public License (EPL) v1.0 | UDF | Michele Loreti | http://jresp.sourceforge.net/?page_id=16 | D1.3 |
| Iliad | Implementation of Logical Inference for Adaptive Devices | Iliad is an implementation of the POEM language that allows developers to analyze and execute POEM specifications | MIT | LMU | Matthias Hölzl | https://github.com/hoelzl/Iliad | D8.3 JD3.2 |
| jDEECo | Java Ensemble Component Framework | jDEECo is a Java-based implementation of the DEECo component model, which is a reification of SCEL geared towards practical development of software systems using SCEL concepts. | Apache License, Version 2.0 | CUNI | Tomáš Bruеš | https://github.com/d3scomp/JDEECo | D5.3 D6.3 D7.3 JD3.2 |
| jRESP | Java Runtime-Environment for SCEL Programs | jRESP is a runtime environment, developed in Java, that aims at providing programmers with a framework that permits developing autonomic and adaptive systems | Eclipse Public License (EPL) v1.0 | UDF | Michele Loreti | https://code.google.com/p/jresp/ | D1.3 D6.3 D7.3 D8.3 JD3.2 |

| Acronym | Software name | Description | License | Partner | Contact | URL | Deliverable |
|---|---|---|---|---|---|---|---|
| jSAM | Java StochAstic Model-Checker | jSAM is an eclipse plug-in integrating a set of tools that permits supporting stochastic analysis of concurrent and distributed systems specified by means of process algebras, e.g. StoKlaim | EPL | UDF | Michele Loreti | http://rap.dsi.unifi.it/SAM/, https://code.google.com/p/jsam/ | D6.3 |
| KLT | KnowLang Toolset | KLT provides a development environment for Knowledge Reasoning (KR) where we can write KR specifications in the KnowLang notation by using visual modeling tools and check for the syntactical integrity and consistency of the KR models. | GPL | UL | Emil Vassev | http://knowlang.lero.ie | D3.3<br>D6.3 |
| Lua-Tools | Lua-Tools | Lua is a scripting language with meta-programming features that is frequently used in embedded devices. Lua-Tools is a library that focuses on the development of adaptive, autonomous systems | MIT | LMU | Matthias Hölzl | https://github.com/hoelzl/Lua-Tools | D8.3 |
| MESSI | Maude Ensemble Strategies Simulator and Inquirer | A framework to model, debug and analyze self-assemble scenarios. | GPL | IMT, UNIPI | Alberto Lluch, Andrea Vandin | http://sysma.lab.imtlucca.it/tools/ensembles/ | D6.3<br>JD3.1<br>JD3.2 |
| MISSCEL | Maude Interpreter and Simulator for SCEL | MISSCEL is an executable operational semantics of SCEL. | GPL | IMT | Andrea Vandin | http://sysma.lab.imtlucca.it/tools/ensembles/ | D1.3<br>D6.3<br>JD3.1<br>JD3.2 |

| Acronym | Software name | Description | License | Partner | Contact | URL | Deliverable |
|---|---|---|---|---|---|---|---|
| Pirlo | Action Programming in Rewriting Logic | Pirlo is an implementation of relational action programming in the MAUDE language that allows specification and interpretation of autonomous component behaviour via non-deterministic procedural action programs. | GPL | LMU | Lenz Belzner | http://www.pst.ifi.lmu.de/~belzner/action-programming/ | D1.3<br>D8.3<br>JD3.1 |
| SCLP | Soft Constraint Solver | An implementation of the Soft Constraint Logic Programming framework executing over CIAO Prolog | GNU LGPL | UNIPI | Valentina Monreale, Ugo Montanari | http://ciao-lang.org/index.html | D7.3<br>JD3.2 |
| SCP | Science Cloud Platform | SCP is a Platform as a Service (PaaS) solution | EPL | Zimory, LMU | Philip Mayer | http://svn.pst.ifi.lmu.de/trac/scp | D3.3<br>D6.3<br>D7.3<br>JD3.2 |
| SDE | Service Development Environment | SDE provides a service-oriented platform for (development) tool integration. | CPL | CUNI | Petr Tuma | http://svn.pst.ifi.lmu.de/trac/sde | D6.3 |
| SPL | Runtime Performance Awareness Framework | SPL provides a performance monitoring service for ensembles implemented in Java | BSD | CUNI | Petr Tuma | http://sourceforge.net/projects/spl-tools/ | D6.3<br>JD3.2 |
| ZEC | Zimory Enterprise Cloud | ZEC provides a web based front-end and a RESTful API to be used within the PaaS solution. It is Zimory's product for IaaS Clouds | Commercial | Zimory | Jose Velasco | http://www.zimory.com | D7.3<br>JD3.2 |

## 2.9 Posters and Flyer

In addition to the ASCENS overview poster used during the first year of the project, a set of posters were recently designed for the ICT 2013 stand. The ASCENS overview poster fulfilled the objective to present key information of the project at a glance (like the list of partners, objectives, case studies and URL of the project website in Figure 5a). The poster includes also a graphical representation of the ASCENS approach and the main research areas. The ICT posters addressed specific topics and results of the project, such as the Ensembles Development Life Cycle, SCEL modeling, formal analysis with BIP, and policy synthesis for non-deterministic domains. An additional poster presented the scenario used in the different demonstrations that was performed during the exhibition on November 6-8, 2013 in Vilnius (see Figures 5b, 5c, 5e, 5d and 5f).

Figures 5 shows the flyer that was prepared for distribution at the forthcoming ICT 2013, that took place on November 6-8, 2013 in Vilnius. The flyer focuses on the Ensemble Development Life Cycle (EDLC) and the methods and tools developed or adapted within the scope of the project for each phase of the EDLC.

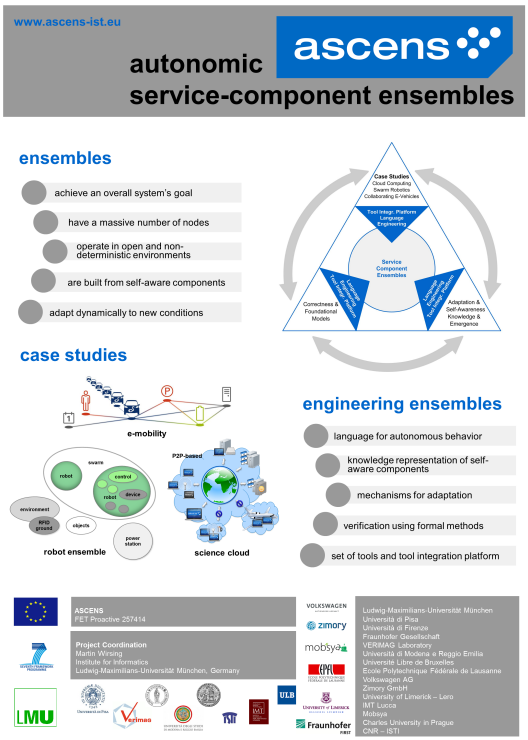
## 2.10 Use of Other Dissemination Channels

The ASCENS project uses a variety of additional and non-traditional channels for the dissemination of project key information and project results, such as presence in social networks, presentations on monitors at the university hall, internal reports at the partners' organizations or local events.

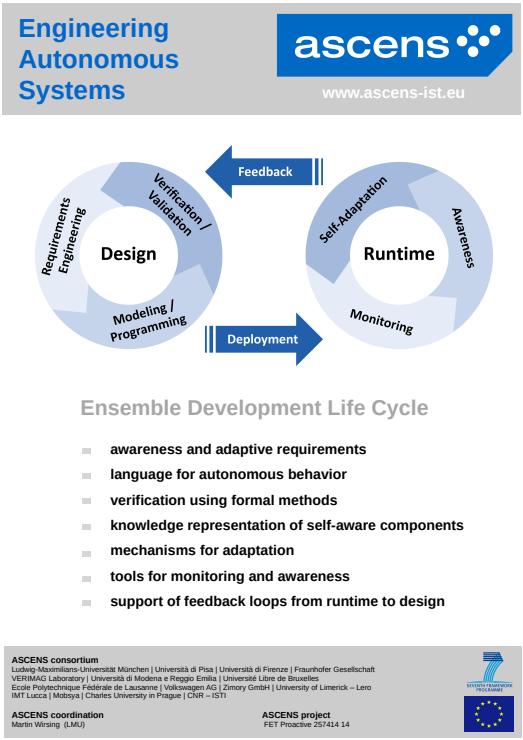
- **Social Networks**. ASCENS has created a facebook page that provides general information about the project, a discussion forum for interaction with interested facebook users, and a platform for content sharing with the public, e.g. graphics and videos illustrating and explaining the progress we make. The facebook page is also integrated with the ASCENS blog, providing users with another way of commenting on our articles and discussing them. Lastly, facebook is a means of improving cooperation and communication among project members by further connecting them.

- **Internet Festival, Pisa, May 5-8 2011.** In 2011 Italy celebrates the 150th Anniversary of Italian unification. The program of national celebrations includes a calendar of initiatives throughout the Italian territory, particularly in the cities that played a key role in the unity process, including Pisa. Pisa has been selected to represent the excellence of Italy in computer science. The Computer Science course at University of Pisa was the first one in the area to be activated in the whole Italy, during the 1960s. While information technologies are changing the changing the ways we understand and construct the world, by providing new ways of sensing, communicating and analyzing data, remains largely unknown to the general audience. Hence, on the occasion of the celebration of the 150th Anniversary of Italy Unification, the Pisa University, the Italian National Research Institute, Scuola Superiore Sant'Anna and Scuola Normale Superiore have organized a conference devoted to the dissemination of research results in computer science. Detailed description of the event is available at `http://2011.internetfestival.it/`. ASCENS contact: Gianluigi Ferrari (UNIPI), Scientific Chair of Internet Festival 2011. Ugo Montanari (UNIPI) gave a Lecture on Autonomic Ensables. Fabio Gadducci (UNIPI) presented a video on History of Computing.

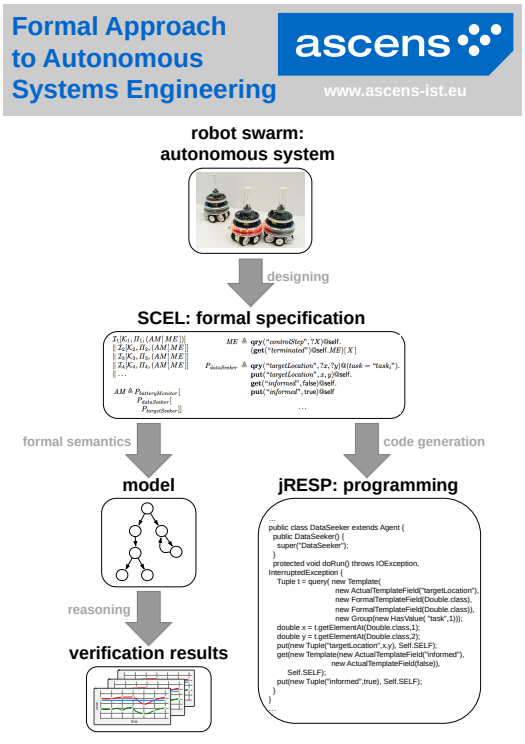
- **LMU Monitors, Munich, June 2011.** ASCENS key data were published on monitors distributed through public accessible areas of the LMU building. ASCENS contact: Nora Koch (LMU). ASCENS contact: Nora Koch (LMU).



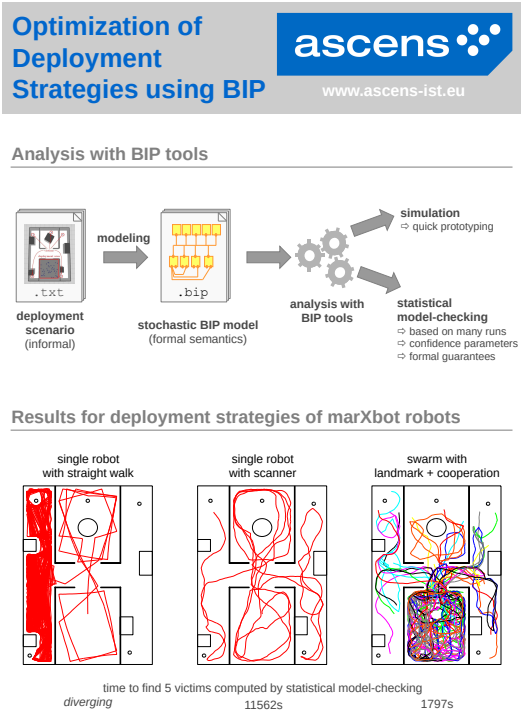

(a) First overview poster




(b) EDLC

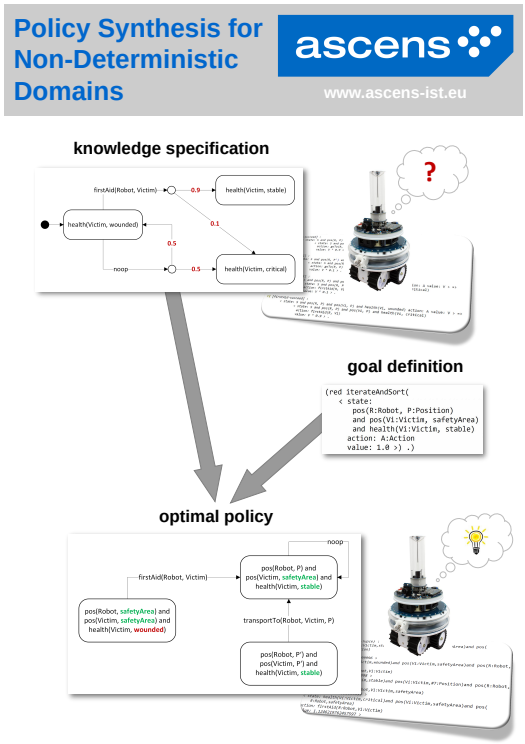



(c) SCEL modeling and JRESP generation

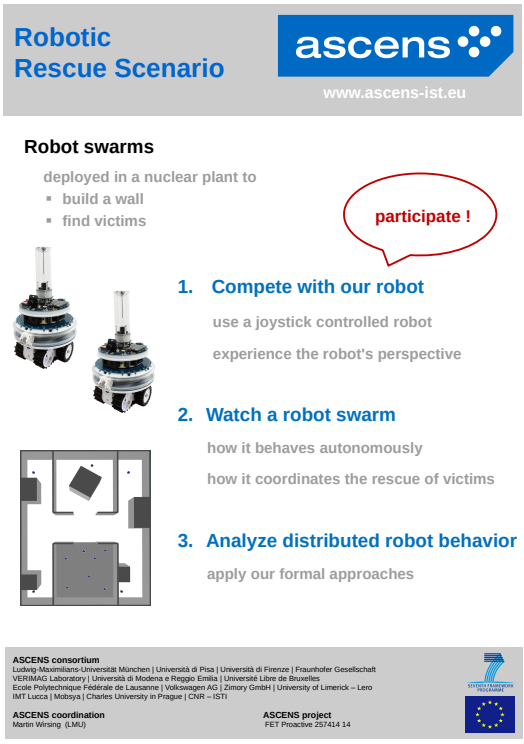



(d) Deployment strategies using BIP

Figure 5: ASCENS posters




(e) Policy synthesis for non-deterministic domains




(f) ICT 2013 demonstrations

Figure 4: ASCENS posters continued

Figure 5: ASCENS flyer

- **Fraunhofer Annual Report, September 2011.**, ASCENS project `http://www.first.fraunhofer.de/uploads/tx_wfproject/Jahresbericht_2010_Projekt_ASCENS_03.pdf` (in German, September 2011), ASCENS contact: Nikola Serbedzija (Fraunhofer).

- **Internet Festival, Pisa, October 4-7 2012.** A second edition of the Internet Festival hast taken place in Pisa in October, with a much broader and larger audience than the first edition. ASCENS contact: Gianluigi Ferrari (UNIPI), chair of scientific committee, and Fabio Gadducci, member of executive commitee.

- Rocco De Nicola (IMT) visited LMU from April 10 to July 28, 2013.

- **Knowledge Acceleration and ICT, Pisa, Italy, September 20, 2013**. The workshop has been jointly organised by UNIPI and the Informatics Eng. Dept. to outline a Tuscany agenda for the European ICT research. Many local companies have participated to the event. ASCENS contact: Ugo Montanari (UNIPI).

- **Internet Festival, Pisa, October 10-13 2013.** A third edition of the Internet Festival hast taken place in Pisa in October, with the same broad scope yet a larger audience than the second edition. ASCENS contact: Gianluigi Ferrari (UNIPI), chair of scientific committee, and Fabio Gadducci, member of executive commitee.

- **ICT 2013, Vilnius, November 6-8 2013**. Exhibition and conference organised by the EC. ASCENS contact: Nora Koch (LMU), Nikola Serbedzija (Fraunhofer), ASCENS demostrations: Michael Bonani (Mobsya), Carlo Pinciroli (ULB), Francesco Tiezzi (IMT), Jacques Combaz (Verimag), Lenz Belzner (LMU).

# 3 Collaboration Platforms and Activities

The collaboration task includes the creation of communication mechanisms and infrastructure at project level and inter-project activities under the umbrella of the proactive initiative's associated Coordination Action AWARENESS. The communication mechanisms within the project are the basis for the creation of collaboration possibilities with other projects, academia and industry in general.

These communication mechanisms comprise mailing lists, an internal collaboration platform (ASCENS wiki), social networks and a set of associated researchers. In particular, the activities within the scope of the coordination action AWARENESS were very fruitful.

## 3.1 Coordination Action AWARENESS

Members of the ASCENS project have been actively involved in the following activities organized by the coordination action AWARENESS or activities in which AWARENESS projects were involved.

- AWARENESS Inaugural Meeting in Amsterdam, The Netherlands, December 14–15, 2010.

- Bilateral meeting of the coordinators of AWARENESS projects ASCENS and SYMBRION in Munich, Germany, February 15, 2011.

- AWARENESS Advisory Board Meeting in Amsterdam, September 22–23, 2011. Presentation on "Research Challenges for Ensembles " (see Sect. 2.4).

- Preparation of the AWARENESS Virtual Lecture Series (AVLS) (http://www.aware-project.eu/lectures/) (see Sect. 2.6).
- AWARENESS Inter-Project Workshop in Bologna, Italy, January 22–26, 2012.
- AWARENESS Summer School (AWASS 2012), in Edinburgh, UK, June 10–16, 2012.
- AWARENESS Slide Factory in Barcelona, Spain, September 24–26, 2012.
- AWARENESS Summer School (AWASS 2013), in Lucca, Italy, June 23–28, 2013.

## 3.2 Associated Researchers

ASCENS invited selected researchers of the relevant communities to become an associated researcher to the project and to keep contact during the duration of the project. Associated researchers were invited to ASCENS meetings and informed by email on the project progress. In particular, Heinz Schmidt, Mario Coppo and Marianguola Dezani used these facilities to participate in the project kick-off and general meetings in Grenoble and Florence. In addition, Hernán Melgratti and Stefano Bistarelli attended the Florence meeting.

The following is the list of the current associated researchers to the ASCENS project.

- Heinz Schmidt, University of Melbourne
- Alexander Knapp, University of Augsburg
- Anders Lyhne Christensen, Inst. Telecom. of Lisbon
- Hernán Melgratti, University of Buenos Aires
- Carla Ferreira, Universidade Nova de Lisboa
- Paolo Baldan, University of Padova
- Barbara Koenig, University of Duisburg-Essen
- Gefei Zhang, Bertelsmann IT, Munich
- Tobias Heindel, University of Paris XIII
- Mariangiola Dezani, University of Torino
- Mario Coppo, University of Torino
- Stefano Bistarelli, University of Perugia
- Emilio Tuosto, University of Leicester
- Massimo Bartoletti, University of Cagliari
- Vincenzo Ciancia, ILLC Amsterdam
- Filippo Bonchi, Ecole Normale Sup Lyon
- Lorenzo Bettini, Università di Torino
- Luis Caires, Universidade Nova de Lisboa

- Marco Bernardo, Università degli Studi di Urbino
- Marco Aldinucci, Università di Torino
- Francesca Rossi, Università di Padova

### 3.3 Contacts to Industry and other Projects

ASCENS partners got in contact with industry, members of other national and European projects; in particular to those related to the AWARENESS coordination action. The most relevant projects, which focus on topics related to the ASCENS research areas, and industrial contacts are listed below. The ASCENS members who are responsible for the contact are included in each item of the list.

- Industry, Intecs Sistemi S.p.A., ASCENS contacts: Mieke Massink, Diego Latella (ISTI)
- Symbrion EU Project, Sergej Kernbach, Universität Stuttgart, ASCENS contacts: Martin Wirsing, Matthias Hölzl, Nora Koch (LMU)
- SAPERE EU Project, Franco Zambonelli, Università di Modena e Reggio Emilia, ASCENS contacts: Franco Zambonelli (UNIMORE)
- COST EU Action Towards Autonomic Road Transport Support Systems, Lee McCluskey, University of Huddersfield, ASCENS contacts: Franco Zambonelli (UNIMORE)
- Project RUPOS (funded by Regione Toscana, Italy), Partners: Link.it and Hyperborea, ASCENS contacts: Roberto Bruni, Andrea Corradini and Gianluigi Ferrari (UNIPI)
- Project SisteR (funded by Italian Ministry for the University), Partners: University of Padua, University of Udine, ASCENS contacts: Andrea Corradini, Fabio Gadducci and Valentina Monreale (UNIPI)
- Project IPODS (funded by Italian Ministry for the University), Partners: University of Turin, University of Bologna, University Ca Foscari of Venice, ASCENS contacts: Roberto Bruni and Ugo Montanari (UNIPI)
- Project TESLA – Techniques for Enforcing Security in Languages and Applications (funded by Regione Sardegna, Italy), Partners: University of Cagliari, University Ca Foscari of Venice, ASCENS contact: Gianluigi Ferrari (UNIPI)
- Member of Scientific Advisory Board of FP7 FET Integrated Project HATS (Highly Adaptable and Trustworthy Software using Formal Methods), ASCENS contact: Ugo Montanari (UNIPI)
- Member of Scientific Advisory Board of ICT-2007.8.6, FET Proactive 6, ICT Forever Yours project CONNECT, Emergent Connectors for Eternal Software Intensive Networked Systems, ASCENS contact: Ugo Montanari (UNIPI)
- Project Pro3D of FP7 ( Programming for Future 3D Architecture with Many Cores) ASCENS contact: Jacques Combaz (Verimag)
- Project NESSoS of FP7 (`http://www.nessos-project.eu/`) Fabio Martinelli, CNR, ASCENS contact: Nora Koch (LMU)
- IBM Smart Cities Center, Dublin, Ireland. ASCENS contact: Franco Zambonelli (UNIMORE)

- Azienda Ospedialiera Universitaria Pisana, Pisa Italy. ASCENS contact: Roberto Bruni, Andrea Corradini, Gian Luigi Ferrari (UNIPI)
- Project H2Swarm (funded by the European Science Foundation). ASCENS contacts: Marco Dorigo (ULB) and Francesco Mondada (EPFL)
- SRI International, Computer Science Laboratory. ASCENS contact: Matthias Hölzl (LMU)
- RMIT University, Melbourne, Australia. ASCENS contact: Martin Wirsing (LMU)
- QUANTICOL EU Project, Rocco De Nicola (IMT), Diego Latella (ISTI), Michele Loreti (UDF), Mieke Massink (ISTI), ASCENS contacts: Mieke Massink, Rocco De Nicola
- FOCAS EU Coordination Action, Franco Zambonelli (UNIMORE), Giacomo Cabri (UNIMORE)
- MUCCA Project on Cooperative Urban Mobility, Regione Emilia-Romagna (I), Franco Zambonelli (UNIMORE)
- Methods and Tools for On-board Software Engineering, ESA/ESTEC CONTRACT No. 4000106016, Lero at UL (Ir), Emil Vassev (UL), Mike Hinchey(UL)
- Project CINA (funded by Italian Ministry for the University), Partners: University of Turin, University of Genova, University of Bologna, University of Camerino, University Ca Foscari of Venice, ASCENS contacts: Rocco De Nicola (IMT)
- DFG Priority Programme Design for Future – Managed Software Evolution. ASCENS contact: Martin Wirsing (LMU)
- Project Distributed MILS of FP7 (`http://www.d-mils.org/`), ASCENS contact: Jacques Combaz (UJF-Verimag)
- Project CERTAINTY of FP7 (`http://www.certainty-project.eu/`), ASCENS contact: Jacques Combaz (UJF-Verimag)

# 4 Exploitable Knowledge

Although the ASCENS project has a strong theoretical orientation focusing on basic research activities around engineering autonomic service-component ensembles, project results are planned to be demonstrated in pragmatic case studies. For example, the partners with expertise in robotics, Université Libre de Bruxelles, Ecole Polytechnique Fédérale de Lausanne and Mobsya are very interested as well in transferring the developed methods, analysis and technologies for ensembles to concrete robot swarms. In particular, the industrial partners, Volkswagen AG and Zimory GmbH are keen to transfer the research results into prototypes and in the future into products; more details in the following sections.

## 4.1 Exploitation Strategies of Industrial Partners

The industrial partners Volkswagen AG and Zimory GmbH defined initial exploitation strategies. Volkswagen AG is planning a new generation of interactive and intelligent e-Vehicles. The ASCENS engineering approach will help Volkswagen to overcome e-Mobility restrictions by developing such e-Vehicles and to support the flexible integration of new services such as e-Charging into the vehicle

under consideration. Zimory developed a unique technology to build federated cloud environments integrated in the current production solutions. This technology enables customers to build infrastructure clouds across their own partner networks. The results of the ASCENS engineering approach will be used by Zimory to improve the cloud environment providing solutions for very critical workloads. In particular, self awareness in such cloud environments will reduce the starting time even more.

The following table provides an overview of the components that Volkswagen and Zimory are developing within the scope of the ASCENS project. The vehicle service planner, the user service planner and the cloud application scheduler are briefly described in the sections below.

| **Type of Exploitable foreground** | **Description of exploitable foreground** | **Confidential** | **Exploitable products** | **Sectors of application** |
|---|---|---|---|---|
| Mobility Scheduling Unit | Software component allowing the user to automatically optimize his daily travel pattern | yes | Mobility Assistant | e-mobility |
| Simulation | Simulation allowing the verification of the behaviour of autonomous, distributed SCs | yes | Simulation | e-mobility |
| Cooperative scheduling Unit | Software component allowing to automatically optimize local travel of individual users and negotiate the said local results on the global system level. The system provides cooperative travel solutions to the user. | yes | Cooperative Mobility Assistant | e-mobility |
| Cloud scheduling component | Software component allowing the autonomous application scheduling in a distributed cloud environment | yes | Cloud application scheduler | cloud computing |

### 4.1.1 Mobility Assistant

Mobility planning services intend to improve mobility resource usage and customer satisfaction. In a connected mobility system, these services need to handle distributed knowledge and operate seamlessly in diverse environments. Sensing, cognition and execution units are distributed on different devices such as vehicles, mobile phones and clouds. The mobility assistant aggregates user-, vehicle- and infrastructure-related information and proposes optimal travel patterns to the user. Human-machine interaction may be realized by web-services, mobile phone applications or in-vehicle navigation services. Based on the personal calendar of the user, the mobility assistant schedules and displays travel information. Results of the scheduling process include route proposals and charging recommendations, which are based on the user preferences. Moreover, the mobility assistant raises the user's awareness of traffic flow, charging station availability and vehicle energy consumption. The mobility assistant continuously observes the energy consumption and intervenes if necessary. The mobility as-

sistant can be understood as a further development of the user journey planner and the vehicle journey planner as described by last year's report.

The development of a distributed, autonomous version of the mobility assistant is greatly suppoted by ASCENS concepts, in particular the design and the verification phase.

### 4.1.2 Simulation of Distributed, Autonomous Agents

Products of autonomous behaviour that are designed in a distributed fashion require extensive evaluation. An extended traffic simulation framework is developed in order to deploy SCs and both verify their behaviour and validate the improvement potential. The traffic simulation is to be used to validate future autonomous services.

### 4.1.3 Cloud Scheduling Component

In the cloud case study the commercial exploitation is focused on leveraging the tools and methods investigated within ASCENS in a commercial context. Of particular interest are the research into and the prototype for the science cloud platform, with a specific focus on how self-aware behavior in cloud applications is realized.

The science cloud platform developed in work package seven of the ASCENS project is used both a set of industry-inspired features testing the ASCENS methods and tools, and, on the other hand, for gathering feedback from the ASCENS tools and methods back to the SCP and industry. The SCP focusses on running applications on a peer-to-peer, voluntary computing based cloud platform, which integrates tightly with the existing Zimory IaaS solution, adding a PaaS layer. A first prototype of the SCP has already been implemented, and a first set of tools and (formal) methods has been applied to the case study.

The next year will see an evaluation phase in which Zimory and the scientific ASCENS partners discuss the use of formal and other methods and tools in the science cloud application area, possibly leading to (architectural) redesigns and/or new insights into tools and methods. The methods will include looking at how self-aware behavior can be successfully achieved. In this context, the focus for the exploitation will be on analyzing a potential implementation in a commercial distributed cloud environment. Zimory will do such an analysis within a high-profile industry project, where multiple industry players aim to build a distributed cloud environment. Zimory will present the results and gather a formal feedback. This feedback will further direct the direction of the commercialization.

## 4.2 Patents

No patents have been registered during the first three periods of the ASCENS project.

## 4.3 Exploitation Strategies of Academic Partners

The use of ASCENS results through academic partners falls into two categories. In the first category, academic partners use the research results in advanced seminars and practical lab courses. In these teaching activities, scientific results of the ASCENS project are presented to students in a way that is embedded within their regular curriculum. Here, the research results presented are leveraged to give students insights into technologies and techniques that go beyond well-established state-of-the-art. In the second category, the ASCENS results are exploited in research activities. Here, PhD students build upon and foster the materials produced in the ASCENS project to advance their research.

In particular, the following partners have performed exploitation strategies on top of the more explicitly mentioned dissemination and exploitation activities (such as invited talks, conference presentations, tutorials, and panels) reported in the respective subsections under Section 2.

**Ludwig-Maximilians-Universität München**

- Graduate Seminar: Dynamic and adaptive systems held in the winter terms of 2010/11, 2011/12, 2012/13, and 2013/14.
- Graduate Seminar: Engineering intelligent distributed systems, held in the summer term of 2013.
- Proseminar, held in German, on Adaptive Systeme (adaptive systems) in the summer term of 2012.
- Annabelle Klarl, Christian Kroiß, Lenz Belzner perform their PhD research on ASCENS topics.

**Università di Pisa**

- Matteo Sammartino and Gianluca Mezzetti perform their PhD research on ASCENS topics at Università di Pisa.
- Alain Tcheukam and Olga Pustovalova perform their PhD research on ASCENS topics at Institutions Markets Technologies - Institute for advance studies Lucca.
- The kick-off meeting of the CINA project (Italian MIUR, PRIN 2010) was organized and held in Pisa on February 4-6, 2013. The CINA projects builds on results of ASCENS.

**Università di Firenze**

Luca Cesari and Andrea Margheri perform their PhD research on ASCENS topics.

**Verimag Laboratory**

Souha Ben Rayana, Ayoub Nouri, and Christian Von Essen perform their PhD research on ASCENS topics.

**Université Libre de Bruxelles**

- ARGoS is used to perform research experiments, as well as teaching activities for the Swarm Intelligence course of ULB.
- ARGoS-Lua is used for educational purposes in the Swarm Intelligence course of ULB.
- ARGoS-MultiVeStA is currently under testing, and used to verify the current ARGoS implementation.

**Charles University of Prague**

- Rima Al Ali, Ilias Gerostathopoulos, Michal Kit, Jaroslav Keznikl, and Vojtech Horky perform their PhD research on ASCENS topics.
- Several department seminars are held throughout the year on the work in progress on ASCENS-related topics.

# 5 Summary

The dissemination activities performed during the first three periods of the project (October 2010 to September 2013) include publication of project results on the ASCENS website and the ASCENS blog, publications and presentations at conferences and workshops, co-organization of events, teaching courses and tutorials, distribution of software products, and the preparation of dissemination material for a wide audience, such as a poster and a magazine overview article.

This section presents a summary "in numbers" to the composition of the consortium and the dissemination of project results and collaboration activities.

| Measurement Category | Subcategory | Year 1 | Year 2 | Year 3 | Total |
|---|---|---|---|---|---|
| **Partners** | Universities | 10 | - | - | 10 |
| | Research organizations | 3 | - | - | 3 |
| | Companies | 2 | - | - | 2 |
| | Countries | 7 | - | - | 7 |
| **Participants** | Researchers | 68 | 1 | 10 | 79 |
| | Associated researchers | 16 | 5 | - | 21 |
| **Web presence** | Web pages | 58 | 8 | 9 | 75 |
| | Blog entries | 8 | 7 | 6 | 21 |
| | Links to project site | 41 | 3 | 2 | 46 |
| **Publications** | Total | 50 | 80 | 62 | 192 |
| | Book contributions | 4 | 1 | - | 5 |
| | Articles in journals | 7 | 9 | 16 | 32 |
| | Papers in conf. and workshops | 37 | 67 | 44 | 148 |
| | Technical reports | 1 | 3 | 2 | 6 |
| | Overview online publication | 1 | - | - | 1 |
| | Joint publications (partners) | 8 | 31 | 20 | 59 |
| | Joint publications (assoc. res.) | 4 | 6 | 2 | 12 |
| **Presentations and tutorials** | | 40 | 31 | 33 | 104 |
| **Summer schools** | co-organized | 2 | 2 | 2 | 6 |
| **Courses** | | 17 | 10 | 12 | 39 |
| **Conferences and workshops** | co-organized | 11 | 20 | 16 | 47 |
| **Contacts** | Industry/other projects | 12 | 5 | 8 | 25 |
| **Software products** | | 4 | 11 | 8 | 23 |

Table 4: ASCENS in numbers