Stefania Costantini: Curriculum Vitae et Studiorum

Short Biography

- Born in 1959. Married, two children, born in 1993 and 1996.
- 1983: Laurea "Magna cum Laude" in Computer Science at the "Università degli Studi di Pisa", Italy.
- 1983 – 1987: Researcher at the Software Engineering Lab, Italtel SIT (telecommunication company), Milano, Italy.
- 1987 – 1990: Grants for research activities in Artificial Intelligence at the Computer Science Department, University of Milano, Italy, by IBM Italy and Hewlett-Packard Italy.
- July 1990 – February 2001: Assistant Professor in Computer Science first at the University of Milano, then (1999) at the University of L'Aquila.
- March 2001 – October 2005: Associate Professor in Computer Science at the University of L'Aquila.
- Since October 2005: Full Professor in Computer Science at the University of L'Aquila. Affiliation: Department of Computer Science and Engineering and Mathematics (DISIM).
- E-mail address: stefania.costantini@univaq.it.

Research

Research interests: Stefania Costantini's research is in the field of Artificial Intelligence, concerning in particular Computational Logic, Logic Programming, Software Agents, Knowledge Representation and Reasoning. Stefania Costantini is the Leader of the AAAI@AQ (Artificial Intelligence and Artificial software Agents) and of the Intelligent Systems and Robotics Lab of the University of L'Aquila.

Logical Agents

Stefania Costantini has proposed (with Arianna Tocchio) a new agent-oriented logic programming language, called DALI, with active and reactive rules. The evolutionary semantics of DALI is fully logical, even though the language provides the treatment of several kind of events, both external and internal. DALI has been fully implemented and experimented in concrete applications, namely in the context of user monitoring and training, hybrid architectures, negotiation scenarios. DALI has been equipped with an innovative and functional communication architecture, and is FIPA-compliant. Stefania Costantini has recently proposed new run-time self-checking techniques for agents (based on suitably defined temporal lgics) that have been experimented in DALI agents, and applied to practical case-studies in system testing and energy saving applications for smart buildings. The DALI interpreter with its documentation is publicly available. Stefania Costantini has proposed advances in the agents field concerning Complex Event Programming, Agents' Memory Management, Run-Time Self-Checking and Assurance, Integration with Heterogeneous Data Sources. The DALI interpreter has recently been extended (with Giovanni De Gasperis, Agnese Salutari, Valentina Pitoni) in view of application to cognitive robotics applications, where a DALI program constitutes the cognitive control part of a robot. This in view of pilot projects concerning care robots in eHealth (see below).

Logic Programming with Negation, and Non-Monotonic Reasoning:

Stefania Costantini has contributed to the theory and practice of Answer Set Programming (ASP), which is a well-established logic programming paradigm, able to cope with uncertainty by producing all consistent alternative answers. She has been studying conditions for the existence of answer sets, and has recently proposed an extended answer set semantics, calle "Resource-based Answer Set Semantics". In recent work, Stefania Costantini (with Andrea Formisano) has introduced in ASP the possibility of reasoning about resources and (even complex) preferences: RASP (Resourced ASP) allows one to specify resources and resource usage, and supports quantitative reasoning on consumption and production of amounts of resources.

A comparison with Linear Logic has been presented. The RASP approach has been prototypically implemented. Recently, Costantini and Formisano have proposed Resource-Based Answer Set Semantics, where: answer sets always exist; top-down query-answering becomes easily feasible. Stefania Costantini (with Andrea Formisano, Pedro Cabalar and Giovanni De Gasperis) has proposed several extension to the Multi-Context System approach for the formal integration of distributed heterogeneous knowledge sources, and has proposed the application of MCSs in the eHealth domain, introducing (with Andrea Formisano, Pedro Cabalar and Giovanni De Gasperis, Antinisca Di Marco, Viviana Mascardi, Valentina Pitoni and others) a system architecture denominated "F&K", for "Friendly and Kind with your health", amenable also to applications involving wearable sensors and care robots controlled by intelligent agents. She has proposed the extension of MCSs to the agent domain by introducing DACMACS (Ontology-Based Agent-Based MCSs), ACEs (Agent Computational Environments) and the highly modular K-ACE architecture (K-level ACEs). In past work, Stefania Costantini has contributed to several aspects concerning Logic Programs with Negation and answer set semantics.

Metalogic Programming

Stefania Costantini studied how to extend logic programming languages with metalogic constructs, i.e., naming mechanisms for reifying language expressions, metalevel rules, and logical reflection for shifting from the object to the metalevel and vice versa. She defined (with Gaetano Aurelio Lanzarone) and developed the metalogic language Reflective Prolog. The decalarive and procedural semantics of Reflective Prolog have been fully defined, and the language and the approach have been applied to several application fields, including Artificial Intelligence and Law, and Analogical and Case-Based Reasoning.

Extracting Knowledge from Natural Language

A central aspect of knowledge acquisition from natural language sources (crucial in the so-called Web 3.0) is related to the automation of the process. Stefania Costantini builds upon recent work, where natural language sentences are translated into ASP, taking into account sentences that imply uncertain knowledge and thus cannot be translated into classical logic.

Publicly Available Software

The AAAI@AQ Research Group has produced the following freely available software packages: RASP inference engine Raspberry: http://www.dmi.unipg.it/ formis/raspberry/ DALI interpreter: DALI GitHub Software Repository: http://github.com/AAAIDISIM-UnivAQ/DALI

Cooperations (Joint Papers, Projects and Activities)

• University of Perugia, Italy (Prof. Andrea Formisano) • University of Messina, Italy (Prof. Alessandro Provetti) • Imperial College London, UK (Prof. Francesca Toni) • Linkoping University, Sweden (Prof. Pierangelo Dell'Acqua) • Universidade Nova de Lisboa, Portugal (Prof. Luıs Moniz Pereira) • University of Corunna, Spain (Prof. Pedro Cabalar) • Universidad Politecnica de Madrid, Spain (Prof. David Pearce)

Periods abroad

Invited Visiting Professor: Univ. of Texas at El Paso (1999); Imperial College London, UK (2004 and 2010); Univ. Politécnica de Madrid, Spain (2010). Corunna Univ., Spain (2010); Fundación Univ. de las Américas, Puebla. México (2012). Invited Speaker at ASPOCP 2016 (Answer Set Programming and Other Computing Paradigms), New York, October 16 2016, and at LA-NMR Workshop on Logic, Languages, Algorithms and New Methods of Reasoning (Mexico City, 2012).

Projects

EUROPEAN PROJECTS COORDINATION: UNIVAQ Node, WASP (Working Group on Answer Set Programming) and CUSPIS (a Cultural Heritage Space Identification System, GJU/05/2412/CTR/CUSPIS).

EUROPEAN PROJECTS PARTICIPATION: COST action IC0801 “Agreement Technologies”, SINTELNET European Network for Social Intelligence (recently completed projects), Esprit P283 FOR-ME-TOO.

NATIONAL PROJECTS PARTICIPATION: 1999-2000 PRIN "Intelligent Agents for Information Extraction", 2000-2001 PRIN "Aggregate- and number-reasoning for computing: from decision algorithms to constraint programming with multisets, sets, and maps".

INDUSTRIAL PROJECTS UNIVAQ UNIT COORDINATION: With CIRA (Centro Italiano di Ricerche Aerospaziali, 2014) and SPEE (2015-present).

Professional Activities

ROLES IN THE UNIVERSITY: 2016-now Member of the University of L’Aquila Quality Assurance Committee. 2012-15: Chairperson of the Bachelor and Master Programs in Computer Science at the University of L'Aquila. Previously Vice-Director of the Dept. of Computer Science, and Chairperson of the Ph.D. Program. Reviewer for the most relevant journals and Conferences related to research interests.

PROGRAM COMMITTEE PARTICIPATION AND CHAIRING: Co-Chair of RuleML+RR 2017, Co-Chair and JLC (Journal of Logic and Computation) Special Issue Editor ASP’07, Chair of GULP92 (Italian Conference on Logic Programming). Vice-President of GULP, Italian Association for Computational Logic. PC Member of almost 100 editions of International Conferences, including (among the best rated ones) editions of IJCAI (International Joint Conference on Artificial Intelligence), ECAI (European Conference on Artificial Intelligence), ICLP (International Conference on Logic Programming), KR (Knowledge Representation and Reasoning), AAMAS (Agents and Multi-Agent Systems), AAAI Conferences on Artificial Intelligence, LPNMR (International Workshop on Logic Programming and Non-Monotonic Reasoning), RuleML (Symposium on Rule Technologies, Research, Tools, and Applications), CLIMA (Computational Logic in Multi-Agent Systems), PRIMA (International Conference on Principles and Practice of Multi-Agent Systems).

Teaching

Stefania Costantini has taught over the years several editions of Courses in the Undergraduate and Graduate tracks in Computer Science at the Universities of Milano (Prolog Lab, Programming Lab, Computer Architectures) and L’Aquila (Databases, Artificial Intelligence, Autonomous Software Agents, Description Logics and Web Ontologies), in the Undergraduate track of Economy at the University of Milano (Programming Lab), in the Undergraduate track in Social Sciences at the University of L’Aquila (Programming Lab). She taught editions of Advanced Databases at the Master in Web Technologies held at the University of L’Aquila, editions of Databases and Intelligent Systems at special tracks for qualification of secondary school teachers held by the University of L’Aquila (PAS and TFA) and editions of Courses of Basic and Advanced Databases, Theory and Technology, for the continuing education of public managers at the SSPA (Public Administration Superior School).

Stefania Costantini: Publications last five years updated June 30, 2017

Complete List, by Subject, by Year (descending)

Software Agents and Multi-Context Systems

1. Pedro Cabalar, Stefania Costantini and Andrea Formisano, Multi-Context Systems: Dynamics and Evolution, Proceedings of the 10th Workshop on Answer Set Programming and Other Computing Paradigms ASPOCP@LPNMR 2017 co-located with LPNMR 2017, CEUR Workshop Proceedings 1868, CEUR-WS.org, http://ceur-ws.org/Vol-1868, 2017.

2. Stefania Costantini, Giovanni De Gasperis, and Giulio Nazzicone. DALI for cognitive robotics: Principles and prototype implementation. In Practical Aspects of Declarative Languages - 19th International Symposium, PADL 2017, Proceedings, LNCS 10137, 152-162. Springer, 2017.

3. Federica Aielli, Davide Ancona, Pasquale Caianiello, Stefania Costantini, Giovanni De Gasperis, Antinisca Di Marco, Angelo Ferrando, and Viviana Mascardi. FRIENDLY & KIND with your health: Human-friendly knowledge-intensive dynamic systems for the e-health domain. In Highlights of Practical Applications of Scalable Multi-Agent Systems. The PAAMS Collection - International Workshops of PAAMS 2016, Communications in Computer and Information Science 616, 15-26. Springer, 2016.

4. Stefania Costantini and Andrea Formisano. Augmenting agent computational environments with quantitative reasoning modules and customizable bridge rules. In AAMAS 2016 Workshops, - Visionary Papers - Revised Selected Papers, LNCS 10003, 104-121. Springer, 2016 (also in Proc. of EMAS@AAMAS2016, LNCS 10093, 192-209, Springer 2016).

4. Stefania Costantini and Andrea Formisano. Budget-constrained reasoning in agent computational environments: (Extended Abstract). In Proceedings of the 2016 International Conference on Autonomous Agents & Multiagent Systems, 1311-1312. ACM, 2016

5. Stefania Costantini and Giovanni De Gasperis. Bridge rules for reasoning in component-based heterogeneous environments. In Rule Technologies. Research, Tools, and Applications - 10th International Symposium, RuleML 2016, Proceedings, LNCS 9718, 97-112. Springer, 2016.

6. Stefania Costantini. ACE: a flexible environment for complex event processing in logical agents. In Engineering Multi-Agent Systems, Third International Workshop, EMAS@AAMAS 2015, Revised Selected Papers, LNCS 9318, 70-91, Springer, 2015.

7. Stefania Costantini, Giovanni De Gasperis, Giulio Nazzicone: Exploration of Unknown Territory via DALI Agents and ASP Modules. DCAI 2015, Volume 363 of Advances in Intelligent Systems and Computing, 285-292, Springer 2015.

8. Stefania Costantini, Giovanni De Gasperis: Exchanging Data and Ontological Definitions in Multi-Agent-Contexts Systems. Challenge+DC@RuleML 2015, CEUR Workshop Proceedings 1417.

9. Pasquale Caianiello, Stefania Costantini, Giovanni De Gasperis, Subhasis Thakur: Cooperating with Trusted Parties Would Make Life Easier. AI*IA 2015, XXIV International Conference of the Italian Association of AI, LNCS 9336, Springer, 128-135

10. Costantini, S., Riveret, R.: Event-action modules for complex reactivity in logical agents. In Proceedings of AAMAS2013, 13th Intl. Conf. on Autonomous Agents and Multi-Agent Systems, IFAAMAS/ACM (2014) 1503–1504 (Extended Abstract).

11. Costantini, S., De Gasperis, G.: Runtime self-checking via temporal (meta-)axioms for assurance of logical agent systems. In Proceedings of LAMAS@AAMAS 2014, 7th Workshop on Logical Aspects of

Multi-Agent Systems 241–255. (also in: Proceedings of the 29th Italian Conference on Computational Logic, CEUR Workshop Proceedings 1195).

12. Costantini, S., Riveret, R.: Complex events and actions in logical agents. In Proceedings of the 29th Italian Conference on Computational Logic. Volume 1195 of CEUR Workshop Proceedings, CEUR-WS.org (2014) 256–271 4.

13. Costantini,S.: Self-checking logical agents. In Proceedings of AAMAS 2013, 12th Intl. Conf. on Autonomous Agents and Multi-Agent Systems, IFAAMAS/ACM (2013) 1329–1330 (Extended Abstract).

14. Caianiello, P., Costantini, S., Gasperis, G.D., Florio, N., Gobbo, F.: Application of hybrid agents to smart energy management of a prosumer node. In Omatu, S., Nieves, J., Rodrıguez, J.M.C., Santana, J.F.D.P., Rodrıguez-Gonzalez, S., eds.: Distributed Computing and Artificial Intelligence - 10th International Conference, DCAI 2013. Volume 217 of Advances in Intelligent Systems and Computing, Springer (2013) 597–607

15. Costantini, S.: Answer set modules for logical agents. In Gottlob, G., ed.: Datalog 2.0. Volume 6702 of Lecture Notes in Computer Science, Springer (2012)

16. Costantini, S., De Gasperis, G.: Complex reactivity with preferences in rule-based agents. In Bikakis, A., Giurca, A., eds.: Rules on the Web: Research and Applications, RuleML 2012 – Europe, Proceedings. Volume 6826 of Lecture Notes in Computer Science, Springer (2012) 167–181

17. Bevar, V., Muccini, H., Costantini, S., De Gasperis, G.,Tocchio,A.: A multi-agent system for industrial fault detection and repair. In: Advances on Practical Applications of Agents and Multi-Agent Systems - 10th International Conference on Practical Applications of Agents and Multi-Agent Systems, PAAMS 2012. Volume 155 of Advances in Soft Computing, Springer (2012)

18. Bevar, V., Costantini, S., Gasperis, G.D., Paolucci, A., Tocchio, A.: Demonstrator of a multi-agent system for industrial fault detection and repair. In Advances on Practical Applications of Agents and Multi-Agent Systems-Proceedings of PAAMS2012. Volume 155 of Advances in Soft Computing., Springer (2012)

Answer Set Programming and Logic Programming with Negation

19. Stefania Costantini, Andrea Formisano:
Query answering in resource-based answer set semantics. TPLP 16(5-6): 619-635 (2016)

20. Stefania Costantini and Andrea Formisano. Negation as a resource: a novel view on answer set semantics. Fundamenta Informaticae, 140(3-4): 279-305, 2015.

21. Stefania Costantini. Knowledge acquisition via non-monotonic reasoning in distributed heterogeneous environments. In Proc. of the 13th Int. Conf. on Logic Programming and Nonmonotonic Reasoning LPNMR 2015. LNCS 9345, Springer, 228-241 (appeared also in Proc. of CILC 2015, 30th Italian Conference on Computational Logic)

22. Stefania Costantini, Giovanni De Gasperis, and Raffaele Olivieri. Digital forensics evidence analysis: An answer set programming approach for generating investigation hypotheses. In Proc. of the 13th Int. Conf. on Logic Programming and Nonmonotonic Reasoning LPNMR 2015. LNCS 9345, Springer, 228-241. (Extended version in CEUR Workshop Proceedings of CILC 2015, 30th Italian Conference of Computational Logic).

23. Costantini, S., Formisano, A.: Query answering in resource-based answer set semantics. In Proceedings of the Intl. ICLP 2014 Workshop on Answer Set Programming and Other Programming Paradigms ASPOCP

2014. (2014) (Also in: Proceedings of the 29th Italian Conf. on Computational Logic, CEUR Workshop Proceedings 1195).

24. Costantini, S., Formisano, A.: Nested weight constraints in ASP. Fundamenta Informaticae 124(4) (2013) 449–464

25. Costantini, S., Formisano, A.: RASP and ASP as a fragment of linear logic. Journal of Applied Non-Classical Logics 23(1-2) (2013) 49–74

26. Costantini, S., Formisano, A.: Negation as a resource: a novel view on answer set semantics. In Cantone, D., Asmundo, M.N., eds.: Proceedings of CILC 2013, 28th Italian Conf. on Computational Logic. Volume 1068 of CEUR Workshop Proceedings, CEUR-WS.org (2013) 253–257

27. Costantini, S., Gasperis, G.D., Florio, N., Zuppella, C.: An ASP-based system for preference handling and planning. In Cantone, D., Asmundo, M.N., eds.: Proceedings of CILC 2013, 28th Italian Conf.on ComputationalLogic.Volume1068ofCEURWorkshopProceedings, CEUR-WS.org (2013) 253–257

28. Costantini, S., Formisano, A., Pearce, D.: Strong equivalence of rasp programs. In: Correct Reasoning - Essays on Logic-Based AI in Honour of Vladimir Lifschitz. Volume 7265 of Lecture Notes in Computer Science. Springer (2012)

29. Costantini, S., Provetti, A.: Conflict, consistency and truth-dependencies in graph representations of answer set logic programs. In Graph Structures for Knowledge Representation and Reasoning-Second International Workshop, GKR2011. Revised Selected Papers. LNCS 7205, Springer (2012) 68–90

30. Costantini, S., Formisano, A.: Preferences and priorities in ASP. In Lisi, F.A., ed.: Proceedings of the 9th Italian Conference on Computational Logic. CEUR Workshop Proceedings 857 (2012) 47–58

Miscellaneous

31. Stefania Costantini, Federico Gobbo:
Elio Lanzarone: a life for science. J. Log. Comput. 25(6): 1371-1378 (2015)