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EDUCATION

PhD (Computer Science):

De Montfort University, Leicester

November 2005

A Compositional Framework for the Specification, Verification and Runtime Validation of Reactive Web Services

In this thesis, we propose an architecture based on a “Compositional” approach, for the specification, verification and runtime validation of reactive services and their composition. We present a sound computational model and a wide spectrum language, *Abstract Service Design Language (ASDL)*, with well defined semantics in terms of our underlying logical framework, for designing service oriented systems. Fundamental to our approach is the notion of Compositionality. To achieve this, we augment Web service specifications with properties called *assumption* and *commitment*. We show how runtime validation of service composition can be achieved using an interpreter for, Tempura, an executable subset of Interval Temporal Logic (ITL). Finally we present “TeSCO-S”: Temporal SemantiCs for OWL enabled Services, a framework along with tool support for enriching Web service interface specifications, described as OWL ontologies with the temporal assertions of *assumption* and *commitment*.

Masters (Advanced Computing):

CDAC - Advanced Computing Training School (India)

1999

Specialization: Data Communication and Networking. Grade (A)

BE (Engineering), Honours (80%):

S.G.S.I.T.S.-Indore (India)

1992

RESEARCH INTERESTS

- **Semantic Web & its Core Technologies**
- **Linked Data and its application to Open government data, Archaeology, Cultural heritage and Geography.**
- **RESTful Web services**
- Semantic Web Services
- Service Oriented Computing (Web Services)
- Distributed computing
- Agent based systems
- Formal methods
- Offline verification(model checking)
- **Runtime monitoring**

RESEARCH

University of Leicester

April 2009-present

Role Researcher

Project Tracing Networks: Leverhulme Trust Programme.

Web <http://www.tracingnetworks.ac.uk/>

Experience Exploring the impact of Semantic Web on cultural heritage and archaeology, designing ontology schemas for archaeological datasets, migrating data from legacy RDBMSs to ontological datasets, developing and implementing a linked open data (LOD) framework for datasets across and beyond the project.

Imperial College London*March 2007-December 2009*

Role	Research associate
Project	CONTRACT (European Commission Framework 6 IST) Project
Web	http://www.ist-contract.org/
Job Description	Designing and developing specifications for contract verification mechanisms/tools with specific emphasis on their application to Web services, using symbolic model checking. Leading the work on designing and developing runtime monitoring mechanisms for Contracts in Web services using a symbolic approach.
Project Management	Successfully coordinated with all partners in the project to achieve the desired objectives. Participated in management teleconferences for the project and attended several managerial board meetings.
Teaching	Tutoring Assistant: Software Engineering, Logic programming

De Montfort University, Leicester*November 2004-February 2007*

Role	Research fellow, Course leader
Projects	Integrating Web services, policies and security - NATO funded project (through their Security through Science call) "Trust Management Systems in Network of Networks".
Teaching	Course Leader: MSc (Distributed Systems Integration) Java Labs and Tutorials for MSc Students: Dec'02, Dec'03 HND students: Feb'03, April'03 Visiting Lecturer: Advanced topics, MSc Software Engineering: The Semantic web: 2008

ACADEMIC PARTICIPATION

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- Served on the program committee for several international workshops and conferences such as AAAI, ISWC, ESWC, AKT-SWS, workshops@WWW, CASE. Served as a reviewer for journals such as Fundamenta Informaticae, Transactions on Services Computing, TCS, Journal of Web Semantics - Elsevier, JAAMAS.
 - Session Chair for the Semantic Web and Archaeology session at CAA2011 Beijing.
 - Participated in the Open Government Data Camp, London, 2010.
 - Participated in the Reasoning Web Summer School, 2009.
 - Participated in Linked data meetups in London, 2009 & 2010.
 - Active member of the OWL-S coalition for Semantic Web services: 2004-2006.
 - Participated in the 2nd European Semantic Web Summer School, 2004.
 - Reviewer for Agentlink.
 - Published: "Finite Element Analysis and Design of Corrugated Packaging".
 - Published "Packaging of Fragile Materials" in capacity of a Project Guide for a project at IIM, Ahmedabad (India).
- Keynotes** Workshop on Challenges and Promises of Semantic Web services, 2006, Nottingham Trent University, UK.
The Role of Semantics in Web service Composition.
- Invited Talks** Linking Open Data: the Pelagios ontology workshop, London, 2011
University of Southampton, 2011
IEEE sponsored International Conference on Image and Signal Processing, Chennai, India, 2010
Tracing Networks Workshop 2009
1st Semantic Web Service Retreat, Austria, 2009
IPIPAN, Warsaw, Poland, 2008
KMI: Open University, 2008
University of Leicester, 2008
De Montfort University, 2007
University of Malta, 2007
HP Labs Bristol, 2004
Agentlink Workshop, 2005

Organisation Originator of the Workshop: YRSOC
Co-organiser: YRSOC 2005-2010, European Young Researchers Workshop on Service Oriented Computing
Open Data Hackthon Day (ODHD) & Random Hacks of Kindness (RHOK), Birmingham 2010.

TEACHING

University of Leicester

January 2009-present

Role

Teaching fellow

Web

<http://www.cs.le.ac.uk/people/ms491/>

Module Convener:

- Introduction to the Semantic Web (MSc)
- Data Structures and Development Environments (Year 1)
- User Interfaces and Human Computer Interaction (Year 2)
- Web Technologies (Year 3)
- MSc Induction lectures
- Software Engineering projects
- BSc and MSc projects
- MSc Personal and group skills

Project supervision:

Administrative duties:

- Staff chair of the Student Staff Committee
- Examination coordinator
- MSc Induction coordinator
- MSc registration coordinator

PROJECT SUPERVISION

Supervised two MSc projects which jointly won the **best** Software Engineering project prize in Spring 2010.

- RESTful Semantic web services for linked open UK Government data.
- A linked data enabled faceted browser for Open streetmap data.

ACADEMIC TRAINING

- Successfully completed a 3 day course with certification on “Postgraduates who teach”
- Successfully completed a 2 day course with certification on “Research Supervision”
- Participated in the “ Graduate Teaching Assistant (GTA) Workshop”
- Currently undertaking a course on Postgraduate Certificate in Academic Practice in Higher Education.

ADDITIONAL

Extensively trained students and industry professionals in programming languages, database design and web development in India between July 1999 to August 2001.

INDUSTRY

i-engineering.com Inc.

1999-2001

Role Team Lead, Software developer and analyst for various Projects

Web <http://www.i-engineering.com/>
(Details provided on Request)

Role Design engineer and analyst for various projects in the engineering domain.
(Details provided on Request)

SOFTWARE SKILLS

I am a very quick learner of programming languages, standards and application frameworks used for mainstream software development. I have ten years experience of working with Semantic Web and Web services technologies and standards. A subset of technologies I have worked with previously and those that I use in my current work are highlighted below:

Programming Languages	Java, Python, Sql/PLSql, C, C++
RDBMS	Oracle, MySQL, Posgresql
Semantic web specifications	RDF, RDF-S, RDFa, Microformats, OWL 2, SPARQL, DL Queries Various OWL APIs and linked data specifications
Triple stores	Jena SDB, Virtuoso
Web applications	Servlets, JSP, PHP, JavaScript, Ajax
Web services	REST, SOAP
IDE, toolkits, Web servers	Netbeans, Eclipse, Apache servers (httpd, Tomcat), Glassfish, Enhydra open source application server, Protege, ActiveBPEL, GWT, Semantic web reasoners
Model checkers	MCMAS, Spin, NuSMV, UPPAAL

REFERENCES

Professor Jose Fiadeiro	HOD: Computer Science University of Leicester Leicester, LE1 7RH cshod@mcs.le.ac.uk
Dr Alessio Lomuscio	Reader Imperial College London London, SW7 2AZ a.lomuscio@imperial.ac.uk
Professor Hussein Zedan	Technical Director STRL, Gateway House De Montfort University Leicester, LE1 9BH zedan@dmu.ac.uk +44 (0)116 2506152

Publications ¹

- Monika Solanki, Yi Hong, and Katharina Rebay-Salisbury. "sea: A framework for interactive querying, visualisation and statistical analysis of linked archaeological datasets". In *CAA: Proceedings of the 39th annual conference on Computer Applications and Quantitative Methods in Archaeology*, 2011.
- L. Bocchi, J. Fiadeiro, S. Gilmore, J. Abreu, M. Solanki, and V. Vankayala. *A Formal Approach to Modelling Time Properties of Service-Oriented Systems.*, chapter Handbook of Research on Non-Functional Properties for Service-oriented Systems: Future Directions. Springer-Verlag, to appear in Spring 2011.
- Alessio Lomuscio, Wojciech Penczek, Monika Solanki, and Maciej Szreter. Runtime monitoring of contract regulated web services. *Fundamenta Informatica*, 2011.
- Alessio Lomuscio, Hongyang Qu, and Monika Solanki. Towards verifying contract regulated service composition. *Autonomous Agents and Multi-Agent Systems*, pages 1–29, 2010. 10.1007/s10458-010-9152-3.
- Yi Hong, Monika Solanki, Lin Foxhall, and Alessandro Quercia. A framework for transforming archaeological databases to ontological datasets. In *CAA: Proceedings of the 38th Annual Conference on Computer Applications and Quantitative Methods in Archaeology*, 2010.
- Alessio Lomuscio, Wojciech Penczek, Monika Solanki, and Maciej Szreter. Runtime monitoring of contract regulated web services, short paper. *AAMAS'10: Proceedings of the 9th international joint conference on Autonomous agents and multiagent systems*, September 2010.
- Alessio Lomuscio and Monika Solanki. Towards an agent based approach for verification of owl-s process models (extended version). In *ESWC 2009 Heraklion: Proceedings of the 6th European Semantic Web Conference on The Semantic Web*, Berlin, Heidelberg, 2009. Springer-Verlag.
- Moez Krichen and Monika Solanki. Automatic generation of real-time observers for monitoring web services. In *Proceedings of the Second International Conference on Web and Information Technologies (ICWIT'09)*, Kerkennah Islands, Sfax, Tunisia, 12-14 June 2009.
- Alessio Lomuscio and Monika Solanki. Towards an agent based approach for verification of owl-s process models. In *4th International IEEE Workshop on Service Oriented Architectures in Converging Networked Environments*, 2009.
- Alessio Lomuscio, Wojciech Penczek, Monika Solanki, and Maciej Szreter. Runtime monitoring of contract regulated web services - short paper. *Third Workshop on Formal Languages and Analysis of Contract-Oriented Software*, September 2009.
- Monika Solanki Alessio Lomuscio, Wojciech Penczek and Maciej Szreter. Runtime monitoring of contract regulated web services. *Workshop on Concurrency, Specification, and Programming*, September 2009.
- Alessio Lomuscio, Hongyang Qu, and Monika Solanki. Towards verifying contract regulated service composition. *ICWS '08. Proceedings of the 6th IEEE International Conference on Web Services, 2008*, September 2008.

¹Details of contribution available on request

- Alessio Lomuscio, Hongyang Qu, and Monika Solanki. Towards verifying compliance in agent-based web service compositions. In *AAMAS '08: Proceedings of the 7th international joint conference on Autonomous agents and multiagent systems*, pages 265–272, Richland, SC, 2008. International Foundation for Autonomous Agents and Multiagent Systems.
- Alessio Lomuscio, Hongyang Qu, Marek J. Sergot, and Monika Solanki. Verifying temporal and epistemic properties of web service compositions. In *ICSOC*, volume 4749 of *LNCS*, pages 456–461. Springer-Verlag, 2007.
- H. Janicke and M. Solanki. Policy-driven service discovery. In *Proceedings of The Second Young Researchers Workshop on Service Oriented Computing (YRSOC-07)*, 2007.
- Monika Solanki, Antonio Cau, and Hussein Zedan. ASDL: a wide spectrum language for designing web services. In *WWW '06: Proceedings of the 15th international conference on World Wide Web*, pages 687–696, New York, NY, USA, 2006. ACM.
- Monika Solanki, Antonio Cau, and Hussein Zedan. Semantically annotating reactive web services with temporal specifications. In *Proceedings of the IEEE ICWS 2005, Second International Workshop on Semantic and Dynamic Web Processes*, volume 140. CEUR Workshop Proceedings, CEUR-WS.org, 2005.
- Monika Solanki, Antonio Cau, and Hussein Zedan. *Semantic Web Processes and Their Applications*, chapter Temporal Specifications for Semantic Web services. Springer-Verlag, 2005.
- Monika Solanki. *A Compositional Framework for the Specification, Verification and Runtime Validation of Reactive Web Service*. PhD thesis, De Montfort University, Leicester, UK, October 2005.
- Monika Solanki. Tesco-s: A framework for defining **TE**mporal **SE**mantiCs in **Owl** enabled **S**ervices. In *W3C Workshop on Frameworks for Semantics in Web Services*, 2005.
- Monika Solanki, Antonio Cau, and Hussein Zedan. Augmenting semantic web service descriptions with compositional specification. In *Proceedings of the 13th international conference on World Wide Web*, pages 544–552. ACM Press, 2004.
- Monika Solanki and Antonio Cau and Hussein Zedan. Introducing Compositionality in Web Service Descriptions. In *Proceedings of the 10th International Workshop on Future Trends in Distributed Computing Systems - FTDCS 2004*, Suzhou, China, May 26-28 2004. IEEE Computer Society Press.
- David L. Martin, Massimo Paolucci, Sheila A. McIlraith, Mark H. Burstein, Drew V. McDermott, Deborah L. McGuinness, Bijan Parsia, Terry R. Payne, Marta Sabou, Monika Solanki, Naveen Srinivasan, and Katia P. Sycara. Bringing semantics to web services: The owl-s approach. In *Proceedings of the First International Workshop on Semantic Web Services and Web Process Composition*, pages 26–42. Springer-Verlag, 2004.
- Monika Solanki and Antonio Cau and Hussein Zedan. Introducing compositionality in webservice descriptions. In *Proceedings of the 3rd International Anwire Workshop on Adaptable Service Provision*, Paris, France, 2003. Springer-Verlag.