Short Curriculum of SONIA BERGAMASCHI

3 January 2017

Personal Data & Academic Career

- SONIA BERGAMASCHI was born in Modena (Italy) on 1/7/1953 where she now lives, she graduated in Mathematics (Laurea degree) at the "Università degli Studi di Modena" (now "Università degli Studi di Modena e Reggio Emilia" - UNIMORE) on 22/3/1977. She is married and has two sons: Fabrizio & Marco.
- since 1/11/1999 she is Full Professor of Computer Science, serving in this position at the UNIMORE Engineering Department "Enzo Ferrari" (www.dief.unimore.it); from 1 Novembre 1992 to 31/10/1999 she was Associate Professor at the UNIMORE Engineering Faculty;
- from 1/3/1984 to 31/10/1992 she was senior researcher at CIOC-CNR research center in Bologna;
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   41125 MODENA (Italy) – tel: +39 059 2056132; fax: +39 059 2056129 – mobile: +39 3357181805.
- She is an ACM Member since January 1998 and ACM Distinguished Scientist since 2016.
- She is an IEEE member since 1992 and IEEE Senior Member since 2016.

Significant professional Leadership

Project Leadership

Sonia Bergamaschi was coordinator (2001-2002) of the Intelligent Information Agents group of the european network of excellence AgentLinkII.

She was responsible for UNIMORE of the IST European Research project "WINK"(2002-2003).

On years 2002-2005, she coordinated the IST European Research project "SEWASIE (Semantic Webs and AgentS in Integrated Economies)", whose aim was to develop a semantic search engine enabling intelligent access to heterogeneous data sources on the web, via semantic enrichment, to provide the basis of structured secure web-based communication.

On years 2005-2006, she was national coordinator of the PRIN project WISDOM (Web Intelligent Search based on DOMain ontologies). The aim of the project was to overcome the "information overloading" problem of traditional search engines.

On years 2006-2009, she was local coordinator for UNIMORE of the IST european project "STASIS (SofTware for Ambient Semantic Interoperable Services)", whose aim was to enable SMEs and corporates to participate in the eEconomy, by offering services and applications based on the open SEEM registry and repository network.

On years 2006-2009, she was the coordinator of the Italian basic research (MIUR FIRB) project "NeP4B (Networked Peers for Business)". NeP4B goal was to contribute innovative ICTs solutions for SMEs, by developing an advanced technological infrastructure to enable companies of any nature, size and geographic location to search for partners, exchange data and services, negotiate and collaborate without limitations and

constraints.

On years 2009-2010 she was the coordinator of the Keymantic project founded by the "Fondazione Cassa di Risparmio di Modena (http://www.fondazione-crmo.it/), whose aim was the development of a keyword-based query engine supporting users in querying the "deep web".

On years 2010-2011 she was the local coordinator for UNIMORE of the P6-IST-4 Project FACIT-SME (Facilitate IT-providing SMEs by Operation-related Models and Methods) project. The project addresses SMEs operating in the ICT domain. The goal was to facilitate the use of Software Engineering (SE) methods and to systematize their application integrated with the business processes. [IJ38]

On 2012-2014 she was coordinator of the UNIMORE strategic research project "ICT- SMART ICT FOR SMART SOCIAL WORLDS", involving about sixty researchers of Computer Science, Telecommunication and Mathematicians of UNIMORE aiming to show the training role of the ICT not only for supporting the industrial and service sectors, but also as a driving and innovative social force.

On 2014 she was the coordinator of the " Open linked data dell'Osservatorio Giovani della Regione Emilia-Romagna", a data integration project developed with MOMIS. The project goal was to identify and integrate the data sources, both proprietary and open, of interest for the youth politics and to make the resulting value-added information public and searchable on the Web as Linked Open Data.

On 2015-2016-2017 she was the recipient of a research grant by CINECA (http://www.cineca.it/en), the italian supercomputing infrastructure supporting the research activities of the scientific community, for the management of Big Scientific Data.

Database Research Group (DBGROUP) Leadership

Since 1992 she leads the database research group (DBGROUP) at UNIMORE (www.dbgroup.unimo.it); the group grew up in the years from one person (myself) to eight person (4 professors: Sonia Bergamaschi, Domenico Beneventano, Maurizio Vincini, Francesco Guerra), 1 senior researcher: Laura Po; 1 senior technician: Alberto Corni &1 phd: Mirko Orsini CEO of the DATARIVER start-up.

- She was the master and phd thesis supervisor of all the members of the DBGROUP and of many other master (about seventy) and phd students (fourteen) who achieved relevant positions in the professional carrier.
  PHD: Domenico Beneventano, Alberto Corni, Jean Paul Ballerini (IBM), Jonathan Gelati (Varian Medical Systems), Ilario Benetti (CEO APEX srl at Modena http://www.apex.it/solutions/en/home), Maurizio Vincini, Mirko Orsini (CEO DATARIVER srl), Laura Po, Serena Sorrentino (BARILLA group), Matteo Interlandi (on moving to UCLA), Marius Olaru (HAVI Logistics - http://www.havi-logistics.com), Giovanni Simonini (post-doc at UNIMORE), Fabio Benedetti (UNIPOL-SAI).
  Master: more than seventy since 1992 (see the DBGROUP site & follow the link published thesis)

Management Experiences at Universities/ Research Labs

- From 2004 to 2010 she was the vice-dean of the DII (Dipartimento di Ingegneria dell'Informazione) at UNIMORE

- From 1 January 2006 to December 2010 she was the dean of the International Doctorate School in ICT at UNIMORE (www.ict.unimore.it) and from 7/5/2009 to December 2010 she was the coordinator of the Council of the Doctorate Schools deans at UNIMORE

- From 1 November 2011 to 30 June 2012 she was the dean of the DII.

Experience of Technological Transfer of Research Results and professional awards

Sonia Bergamaschi was the promoter of the academic (UNIMORE) start-up "DataRiver" (www.datariver.it)
On 2009 she founded DataRiver and from then to now she plays the role of scientific responsible of the
company. Now DATARIVER is a successful company employing 6 person full time.

 The DataRiver start–up was the winner of relevant grants for innovative Start-Ups:
- Bando "FIT Start-Up" Fondo per l'Innovazione Tecnologica of the Ministero dello Sviluppo
   Economico, L. 46/82. Research grant of 684.000 € in 3 years (2012-2014) to support the research
   and development of an advanced integration system for traditional and multimedia data;
- Bando POR FESR 2007-2013 "Sostegno allo start-up di nuove imprese innovative" of the Emilia
   Romagna Region, Activity I.2.1. Research grant of 44.000 € to support the development of the
   MOMIS Data Integration System.

Significant Technical Contributions

Sonia Bergamaschi research activity has been mainly devoted to Knowledge Representation and
Management in the context of Very Large Databases and Knowledge Bases facing both theorical and
implementation aspects as described in the following.

Databases & Description Logics

Since 1985 she was very active in the area of coupling artificial intelligence (Description Logics) and
database techniques to develop Intelligent Database Systems. On this topic very relevant theoretical results
have been obtained [IJ3, IJ12].

Intelligent Information Integration

Since 1997 (and up to now), her research efforts have been devoted to the **Intelligent Information
Integration (I3)** topic. An I3 system, called **MOMIS**, providing an integrated access to structured and
semistructured data sources and allowing a user to pose a single query and to receive a single unified answer
has been designed and developed. Description Logics, Automatic Annotation of schemata plus clustering
techniques constitute the theoretical framework. The seminal papers were: [IJ8, IC35].
MOMIS development started on 1999 and was carried out with the contribution of the DBGROUP members
and of many phd and master students with the financial support up to 3million euros of many EU and MIUR
Italian research projects (for details on projects see the site: www.dbgroup.unimo.it).
On 2009 Sonia Bergamaschi founded the academic start-up **DataRiver** (www.datariver.it), whose aim was
the engineering and delivering of an open source version of the **MOMIS system** (see in [IBCH8] the system
architecture).

Semantic Web, Automatic Annotation, Linked Open Data

Since 2002 (and up to now) her research activities have been extended to the **Semantic Web** research area,
including MOMIS as the main architectural component of semantic search engines [IBCH6].
On Automatic annotation of schemata and inter-schema mapping discovery, very relevant theoretical results
have been obtained [IJ24, IC84, IC101].

Since 2013 (and up to now) her research activities have been extended to the Linked Open Data research
area. A semi-automatic methodology for facilitating resource providers in publishing public data into the
Linked Open Data (LOD) cloud, and for helping consumers (companies and citizens) in efficiently accessing
and querying them was designed. To significantly increase the number of consumers of LOD data, a new
method and a tool, LODeX have been devised. LODeX is able to automatically provide a high level

summarization of a LOD dataset, including its inferred schema, and a powerful visual query interface to support users in querying/analyzing the dataset. (see http://www.dbgroup.unimo.it/site2012/index.php/component/content/article/2-uncategorised/97-lod for more details)

Keyword Search

Since 2009 (and up to now) her research activities has been extended to the Keyword Search research area.

On Keyword Search very relevant theoretical results have been obtained [IC85, IJ25, IJ39] and a tool, Keymatic (http://www.dbgroup.unimo.it/keymantic), performing rewriting of keyword queries over relational databases has been implemented. On years 2014-2016 she is participating at the IC1302 COST Action "KEYSTONE - Semantic keyword-based search on structured data sources" (2014-2017)

(See http://www.dbgroup.unimo.it/site2012/index.php/component/content/article/2-uncategorised/96-kywordsearch)

Big Data

Since 2013 (and up to now) her research activities has been extended to the Big Data Research Area. She is member of the CINI Big Data Lab and responsible of the UNIMORE Big Data Lab (see http://www.dbgroup.unimo.it/site2012/index.php/component/content/article/2-uncategorised/94-bigdata).

On 2014 and 2015 she was a co-organizer and teacher of the "Emerging Tools and techniques for massive data analysis" schools promoted by Cineca.

She was invited speaker on Big Data Management and author of papers in International Conferences (see http://www.dbgroup.unimo.it/site2012/index.php/component/content/article/2-uncategorised/94-bigdata for more detailed information).

She is currently responsible for UNIMORE of the Emilia Romagna research project "Creazione di valore per imprese e società con la gestione e l'analisi di Big Data" i.e. Making Value for enterprises and society by managing and analysing Big Data.

She published more than two hundreds of international journal and conference papers and her researches have been founded by the Italian MURST, CNR, ASI institutions and by the European Community.

For a detailed description of the research activity see: www.dbgroup.unimo.it.

For a complete list of pubblications see:

DBLP

http://dblp.uni-trier.de/pers/hd/b/Bergamaschi:Sonia

Google Scholar

https://scholar.google.it/citations?user=AECQn1MAAAAJ&hl=it

Bibliometric Indexes at 04/01/2017

SCOPUS H-Index: 18

Google Scholar H-Index: 25

Substantial professional contributions

She has served on the committees of international and national database and AI journals and conferences (SIGMOD, VLDB, IJCAI, KR, ER, OODBASE, SEBD, ACM TODS, ACM TOIS, Information Systems, ICDE, IEEE TKDE,) and was co-chair in several workshops and conferences (DBISP2P, AP2PC, SWAE), Phd symposium chair for the 2012 E/R conference and Program Committee Chair of the ODBASE 2012 conference.

Selected Pubblication   IJ = Intern. Journal   IC= Intern. Conference

[IJ3] S. Bergamaschi, C. Sartori, "On taxonomic reasoning in conceptual design", ACM Transaction on Database Systems, Vol. 17, No. 3, Settembre 1992, pagg. 385-422.

 [IJ12] D. Beneventano, S. Bergamaschi, C. Sartori: "Description Logics for Semantic Query Optimization in Object-Oriented Database Systems", ACM Transaction on Database Systems, Volume 28: 1-50 (2003).

 [IJ8] S. Bergamaschi, S. Castano e M. Vincini "Semantic Integration of Semistructured and Structured Data Sources", ACM SIGMOD Record Special Session on Semantic Interoperability in Global Information, Vol. 28, n.1, March 1999.

[IC35] D. Beneventano, S. Bergamaschi, S. Castano, A. Corni, R. Guidetti, G. Malvezzi, M. Melchiori e M. Vincini: "Information Integration: the MOMIS Project Demonstration", International Conference on Very Large Data Bases (VLDB'2000), Cairo, Egypt, Settembre 2000. & ACM SIGMOD Digital Symposium Collection 2000 (DiSC2000) (http://www.cs.wpi.edu/~ifc/DISC)

[IBCH8] S. Bergamaschi, D. Beneventano, F. Guerra, M. Orsini, "Data Integration", In: D. W. Embley, B.Thalheim, Handbook of Conceptual Modeling. pp. 441-476, 2011, Berlin Heidelberg: Springer Verlag.

[IBCH6] D. Beneventano, S.Bergamaschi: "Semantic search engines based on data integration systems". In Semantic Web Services: Theory, Tools and Applications. Idea Group Publishing, 2007.

[IJ24] S. Sorrentino, S. Bergamaschi, M. Gawinecki, L. Po "Schema Label Normalization for Improving Schema Matching", Data & Knowledge Engineering, vol. 69, no. 12, pp. 1254-1273, 2010, ISSN: 0169-023X.

[IC84] S. Bergamaschi, M. Gawinecki, Sorrentino S. (2011). NORMS: an automatic tool to perform schema label normalization. In: ICDE- International Conference on Data Engineering- 2011. Hannover, Germany, 11-16 Aprile 2011, p. 1344-1347, Los Alamitos:IEEE Computer Society 2011, ISBN: 9781424489589.

[IC85] Sonia Bergamaschi, Elton Domnori, Francesco Guerra, Raquel Trillo Lado, Yannis Velegrakis (2011): Keyword search over relational databases: a metadata approach. SIGMOD Conference 2011: 565-576.

[IJ25] S. Bergamaschi, E. Domnori, F. Guerra, M. Orsini, R. Trillo Lado, Y. Velagrakis, "Keymantic: Semantic Keyword-based Searching in Data Integration Systems", Proceeding of the VLDB Endowment, vol. 3, no. 2, pp. 1637-1640, 2010, ISSN: 2150-8097.

[IJ38] Sonia Bergamaschi, Riccardo Martoglia, Serena Sorrentino: " Exploiting semantics for filtering and searching knowledge in a software development context". Knowl. Inf. Syst. 45(2): 295-318 (2015)

[IJ39]Sonia Bergamaschi, Francesco Guerra, Matteo Interlandi, Raquel Trillo Lado, Yannis Velegrakis: "Combining user and database perspective for solving keyword queries over relational databases". Inf. Syst. 55: 1-19 (2016)

[IC101] Lorenzo Albano, Domenico Beneventano, Sonia Bergamaschi: "Multilingual Word Sense Induction to Improve Web Search Result Clustering". WWW (Companion Volume) 2015: 835-839.

[IJ41] Giovanni Simonini,   Sonia Bergamaschi, H.V. Jagadish (2016): "BLAST: a Loosely Schema-aware Meta-blocking Approach for Entity Resolution". PVLDB Vol 9. N.12.