

## Dr. Carlo Torniai

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### PROFESSIONAL SUMMARY

Dr. Carlo Torniai is an ontologist and a research scientist with a wide range of experience across several areas of Computer Science and Information Technology.

His main topics of expertise are ontology development, data integration, Semantic Web applications in biomedical, e-learning and multimedia domains. Dr. Torniai's skills and expertise have been gained during 13+ years of experience in industry (as System Administrator, Network Engineer and CTO) and in Academia where, as a research scientist, he has been constantly involved in innovative research projects involving the Semantic Web and ontologies.

### EDUCATION

**2007 PhD in Computer Science**

Media Integration and Communication Center, Universita' degli Studi di Firenze

**2003 Master in Internet Engineering,**

Universita' degli Studi di Firenze

**1998 Telecommunication Engineering Degree (Master equivalent, 5 Years degree)**

Universita' degli Studi di Firenze

### PROFESSIONAL EXPERIENCE

**Oregon Health and Science University- USA**

**Oct. 2009 - Present**

**Assistant Professor, Ontologist**

**Responsibilities:** I'm working on several projects implementing and integrating ontologies for representation of biomedical resources and clinical data). Within the eagle-i project (<https://open.med.harvard.edu/display/eaglei/Welcome>) I have developed and I currently maintain the ontologies used by the data annotation and search applications and I'm responsible of Semantic QA and reporting on data. I also participate in the development of several ontologies: I'm part of the development team of the Ontology for Biomedical Investigation (OBI, [http://obi-ontology.org/page/Main\\_Page](http://obi-ontology.org/page/Main_Page)), developer of the reagent ontology (ReO, <http://code.google.com/p/reagent-ontology/>), contributing to the integration of the VIVO ontology ([www.vivoweb.org](http://www.vivoweb.org)) with the eagle-i ontology.

**Cisoft - University of Southern California - USA**

**Jul. 2008 – Sept. 2009**

**Postdoctoral Research Associate**

**Responsibilities:** I was involved in the development and deployment of a large-scale knowledge management system based on Semantic Web technologies for **Chevron**.

**Major accomplishments:** I have defined an Ontology for Events in Reservoir Management, and used rule-based reasoning for event detection and correlation. I have applied for a **Patent** related to **“System and Method for Data Provenance Management”** in September 2008.

**Simon Fraser University - Canada**

**Aug. 2007 - Jul. 2008**

**Postdoctoral Fellow**

**Responsibilities:** In the scope of the LORNET project I conducted research related to Semantic Web technologies in e-learning with particular focus on **Social Semantic Web**.

**Major accomplishments:** I've proposed a novel method of interaction between folksonomies and ontologies in order to ease the ontology maintenance process. I've investigated relations between Web 2.0 and the Semantic Web.

**Hewlett Packard Labs - UK**

**May 2006 - Nov. 2006**

**Visiting researcher**

**Responsibilities:** Development of the **Semantic Photo** Project.

**Major accomplishments:** I've defined mechanism for discovering, sharing and browsing images based on **RDF** geo-location metadata shared through **SPARQL** endpoints.

**MICC - Italy**

**Jan. 2002 - Aug. 2007**

**Researcher / Project manager**

**Responsibilities:** Responsible for several **technology transfer** projects and principal investigator for the research related to Semantic Web Technologies and Multimedia.

**Major accomplishments:** I've introduced the novel idea of **OWL ontologies** enriched with visual concepts for describing video content based on MPEG-21, proposed algorithms for video annotation based on enriched ontologies, and developed a set of software tools and visual interfaces for the semantic retrieval of videos.

I've also led the development and deployment of Web applications for Public Administration (E-government solutions based on interoperability and ERP deployment project analysis).

**Motoride.com - Italy**

**Apr. 2000 - Jan. 2002**

**Chief Technology Officer**

**Responsibilities:** Architecture design and implementation of the network infrastructure, Web application development for the portal.

**Major accomplishments:** Starting from the vendor and software selection, through system architecture design until the implementation I successfully led the deployment and the maintenance of the e-commerce portal based on **BroadVision**, managing a group of 5 system engineers and developers.

**Menarini - Italy**

**Dec. 1998 - Apr. 2000**

**System and Network Engineer**

**Responsibilities:** **LAN and WAN design**, Web sites administration, IT corporate standards compliance.

**Major accomplishments:** I've successfully led the project of the corporate Web site development and deployment. I've followed several European affiliated companies in the transition towards IT corporate standards.

## PUBLICATIONS

### *Journal editorial*

Bertini, M., Devedžić, V., Gašević, D., Torniai, C., "Editorial: Semantic Technologies for Multimedia-enhanced Learning Environments," **Interactive Learning Environments**, Vol. 19, No. 1, 2011, pp. 1-4

### *Book Chapters*

C. Torniai, S. Battle, S. Cayzer, "**Sharing, Discovering and Browsing Geotagged Pictures on the Web**", in "Geospatial Web. How Geo-Browsers, Social Software and the Web 2.0 are Shaping the Network Society", Springer, 2007

### *International Journals*

"Gasevic. D., Zouaq. A, Torniai C., Jovanovic, J., Hatala, M., "**An Approach to Folksonomy-based Ontology Maintenance for Learning Environments**", IEEE Transactions on Learning Technologies, 2011 (in press)

Bertini, M., Devedžić, V., Gašević, D., Torniai, C., "**Editorial: Semantic Technologies for Multimedia-enhanced Learning Environments**," Interactive Learning Environments, Vol. 19, No. 1, 2011, pp. 1-4

Jovanović, J., Gašević, D., Torniai, C., Bateman, S., Hatala, M., "**The Social Semantic Web in Intelligent Learning Environments-State of the Art and Future Challenges**," Interactive Learning Environments, Vol. 17, No. 4, 2009, pp. 273–308

M. Bertini, R. Cucchiara, A. Del Bimbo, C. Grana, G. Serra, C. Torniai, R. Vezzani "**Dynamic Pictorially Enriched Ontologies for Video Digital Libraries**", IEEE Multimedia, April-June 2009 (vol. 16 no. 2) pp. 42-51

Jovanović, J., Gašević, D., Torniai, C., Devedžić, V., " **Using Semantic Web Technologies to Provide Contextualized Feedback to Instructors**," In Dicheva, D., Mizoguchi, R., Greer, J., (Eds.) Using Semantic Web Technologies to Provide Contextualized Feedback to Instructors, IOS Press, Amsterdam, The Netherlands, 2009

M. Bertini, A. Del Bimbo and C. Torniai, "**Multimedia Enriched Ontologies for Video Digital Libraries**", International Journal of Parallel, Emergent and Distributed Systems, January 2007; Vol. 22. No. 6, pp. 407–416.

### *International Conferences*

Torniai C et al. "**Developing an application ontology for biomedical resource annotation and retrieval: challenges and lessons learned**", (2011) Proceedings: International Conference on Biomedical Ontology, Buffalo, NY.

Mungall, C.J., Haendel, M.A., Ireland, A., Manzoor, S., Meehan, T., Osumi-Sutherland, D., Torniai, C., Diehl, A.D. (2011) "**Modularization for the Cell Ontology**." Proceedings: International Conference on Biomedical Ontology, Buffalo, NY.

Torniai C, et al. "**eagle-i: an ontology-driven framework for biomedical resource annotation and discovery**". Bio-Ontologies 2010 Semantic Applications in Life Sciences, ISMB 2010; July 9-10, 2010; Boston, MA

Hatala, M., Gašević, D., Siadaty, M., Jovanović, J., Torniai, C. "**Utility of Ontology Extraction Tools in the Hands of Educators**", In Proceedings of the 3rd IEEE International Conference on Semantic Computing, Berkeley, CA, USA, 2009, pp. 408-413

Jing Zhao, Fan Sun, Carlo Torniai, Amol Bakshi, Viktor Prasanna, "**A Provenance-Integration Framework for Distributed Workflows in Grid Environments**" Workshop on Grid and Utility Computing (WUGC), Bangalore, December 2008.

Siadaty, M., Eap, T., Jovanović, J., Gašević, D., Torniai, C., Hatala, M., "**Semantic Technologies for Socially-enhanced Context-aware Mobile Learning**", In Proceedings of the 3rd European Conference on Technology Enhanced Learning, 2008, pp. 413-418

Siadaty, M., Torniai, C., Gašević, D., Jovanović, J., Eap, T., Hatala, M., "**Ontological Support for Socially-enhanced Self Regulated Learning**," *In Proceedings of the 1st International Workshop on Ontology-based Learning Resource Repositories at 9th International Conference on Intelligent Tutoring Systems*, Montreal, Canada, 2008

Siadaty, M., Torniai, C., Gašević, D., Jovanović, J., Eap, T., Hatala, M., "**m-LOCO: An Ontology based Framework for Context-Aware Mobile Learning**," In Proceedings of the 6th International Workshop on Ontologies and Semantic Web for Intelligent Educational Systems at 9th International Conference on Intelligent Tutoring Systems, 2008

Torniai, C., Jovanović, J., Bateman, S., Gašević, D., Hatala, M., "**Leveraging Folksonomies for Ontology Evolution in E-learning Environments**", In Proceedings of the 2nd IEEE International Conference on Semantic Computing, Santa Clara, CA, USA, 2008, pp. 206-215

C. Torniai, J. Jovanović, S. Bateman, D. Gašević, and M. Hatala, "**E-learning meets Social Semantic Web**", 8th IEEE International Conference on Advanced Learning Technologies, Santander, Cantabria, Spain, 1-5 July 2008

J. Jovanović, C. Torniai, D. Gašević and M. Hatala "**Leveraging the Social Semantic Web in Intelligent Tutoring Systems**", International Conference on Intelligent Tutoring Systems, Montreal Canada, 23-28 June 2008

S. Bateman, J. Jovanović, C. Torniai, D. Gašević, and M. Hatala "**Combined Usage of Ontologies and Folksonomies in E-learning Environments**", Semantic Web User Interaction Workshop, CHI 2008, 5-10 April 2008, Florence, Italy

M. Bertini, A. Del Bimbo, C. Torniai, R. Cucchiara, C. Grana, "**Dynamic Pictorial Ontologies for Video Digital Libraries Annotation**", In Proceedings of the ACM MIR workshop on the Many Faces of Multimedia Semantics, Ausburg, Bavaria, Germany, September 28, 2007, pp. 47 – 56

- A. Bagdanov, M. Bertini, A. Del Bimbo, G. Serras and C. Torniai, “**Semantic annotation and retrieval of video events using multimedia ontologies**”, In Proceedings of the IEEE International Conference on Semantic Computing ICSC 2007, Irvine, California, 17-19 September 2007, pp. 713-720
- M. Bertini, A. Del Bimbo, C. Torniai, C. Grana, R. Vezzani, R. Cucchiara, “**Sports Video Annotation using Enhanced HSV histogram in Multimedia Ontologies**”, In Proceedings of the International Workshop on Visual and Multimedia Digital Libraries (VMDL07), Modena, Italy, September 13-14, 2007, pp. 160-167
- C. Torniai, S. Battle, S. Cayzer, “**The Big Picture: Exploring Cities through Georeferenced Images and RDF Shared Metadata**”, CHI 2007 Workshop “Imaging the City”, San Jose, 19 April, 2007
- C. Torniai, S. Battle, S. Cayzer, “**Sharing, Discovering and Browsing Photo Collections through RDF geo-metadata**”, In Proceedings of SWAP 2006, the 3rd Italian Semantic Web Workshop, Pisa, Italy, December 18-20, 2006, CEUR Workshop Proceedings, ISSN 1613- 0073, online <http://sunsite.informatik.rwth-aachen.de/Publications/CEUR-WS/Vol-201/07.pdf>
- M. Bertini, A. Del Bimbo, C. Torniai, R. Cucchiara, C. Grana, “**MOM: Multimedia Ontology Manager. A Framework for Automatic Annotation and Semantic Retrieval of Video Sequences**”, in Proceedings of the 14th annual ACM international conference on Multimedia, Santa Barbara, CA, USA, Oct. 23-27, 2006, pp. 787-788
- C. Grana, R. Vezzani, D. Bulgarelli, G. Gualdi, R. Cucchiara, M. Bertini, C. Torniai, A. Del Bimbo, “**PEANO: Pictorial Enriched ANnotation of VideO**”, in Proceedings of the 14th annual ACM international conference on Multimedia, Santa Barbara, CA, USA, Oct. 23-27, 2006, pp. 793-794
- M. Bertini, A. Del Bimbo and C. Torniai, “**Automatic Annotation and Semantic Retrieval of Video Sequences using Multimedia Ontologies**”, in Proceedings of the 14th annual ACM international conference on Multimedia, Santa Barbara, CA, USA, Oct. 23-27, 2006, pp. 679- 682
- M. Bertini, A. Del Bimbo and C. Torniai, “**Ontologies for Video Digital Libraries**”, In Proc. Of the 7th KDD Multimedia Data Mining workshop report, in conjunction with the 12th ACM SIGKDD International Conference on Knowledge Discovery and Data Mining, August 20-23, 2006 Philadelphia, PA, USA
- M. Bertini, G. D'Amico, A. Del Bimbo, C. Torniai, “**Using Knowledge Representation Languages for Video Annotation and Retrieval**”, In Proceedings of Flexible Query Answering Systems (FQAS) 2006, Milano, June 7-10, 2006, pp. 634-646
- M. Bertini, A. Del Bimbo, C. Torniai, “**Video Annotation and Retrieval with Pictorially Enriched Ontologies**”, in Proceedings of Italian Research Conference on Digital Libraries Management System (IRCDL), Padova (IT), January 27, 2006, pp. 76-79
- M. Bertini, A. Del Bimbo, C. Torniai, “**Automatic Video Annotation Using Ontologies Extended With Visual Information**”, In Proceedings of the 13th annual ACM international conference on Multimedia, Singapore November 6-12, 2005, pp. 395-398
- M. Bertini, A. Del Bimbo, C. Torniai, “**Enhanced Ontologies for Video Annotation and Retrieval**”, In Proceedings of the 7th ACM SIGMM international workshop on Multimedia Information Retrieval (MIR), Singapore November 10-11, 2005, pp. 89-96

M. Bertini, R. Cucchiara, A. Del Bimbo, C. Torniai, "**Domain Knowledge Extension with Pictorially Enriched Ontologies**", 11th International Conference on Computer Analysis of Images and Patterns (CAIP) , Rocquencourt, September 5-8, 2005, pp. 652-660

M. Bertini, A. Del Bimbo, R. Cucchiara, C. Torniai, "**Video Annotation with Pictorially Enriched Ontologies**", In proceedings of IEEE International Conference on Multimedia and Expo (ICME), Amsterdam (NL), July 6-8, 2005, pp. 1428-1431

M. Bertini, A. Del Bimbo, R. Cucchiara, C. Torniai, "**Ontologies enriched with visual information for video annotation**", Multimedia and the Semantic Web Workshop in Conjunction with the 2<sup>nd</sup> European Semantic Web Conference (ESWC), Heraklion (GR), May 29, 2005

#### *Tutorials*

Bjoern Peters (La Jolla Institute for Allergy and Immunology), Jie Zheng, Philippe Rocca-Serra, Carlo Torniai, Melissa Haendel, "**OBI: A Shared Ontology for Representing Biomedical Studies and Resources**", ICBO 2011 Buffalo (NY)

Gašević D., Witte R., Torniai C. "**Tools for the Semantic Web: Semantic Web Technologies in Multimedia Enhanced Applications**", 4th Annual LORNET Conference on Intelligent, Interactive, Learning Object Repositories Network, Montreal, November 2007

#### *Magazines*

M. Bertini, A. Del Bimbo and C. Torniai, "**Ontologies for Video Digital Libraries**" ERCIM News Special Issue on "European Digital Libraries", Number 66, July 2006, pp. 37

C. Torniai, "**Exploring Maps through Georeferenced Images and RDF Shared Metadata**", Informer, Number 23, Summer 2007, ISSN 0950-4974, p. 6-7

#### *Technical Reports*

C. Torniai, S. Battle, S. Cayzer, "**Sharing, Discovering and Browsing Geotagged Pictures on the Web**" <http://www.hpl.hp.com/techreports/2007/HPL-2007-73.pdf>

### **PROGRAM COMMITTEES**

International Workshop on eLearning Approaches for the Linked Data Age (Linked Learning) 2012

International Workshop on Visual interfaces to the Social and the Semantic Web (VISSW 2009)

IADIS International Conference Web based Communities 2008- 2011

IADIS International Conference - Information Systems 2008 - 2011

Workshop on Visual interfaces to the Social and the Semantic Web (VISSW 2009)

SAAKM2008, Semantic Authoring, Annotation and Knowledge Markup Workshop

### **PATENTS**

**System and Method for Data Provenance Management**, co-inventors: Jing Zaho, Fan Sun, Carlo Torniai, Amol B. Bakshi, assignors to Chevron USA Inc, applied September, 2008, US Patent Application No. 12/275877; Chevron Ref: T-7544

### **TEACHING EXPERIENCE**

I developed courses and give lectures in the following topics:

**Web languages and programming**, 2006 - Master in Multimedia Content Design, University of Florence, Italy

**Multimedia and Semantic Web**, 2005 and 2006 - Module of the Multimedia Database course Computer Engineering Faculty, University of Florence, Italy

**Fundamentals of knowledge representation and Semantic Web**, 2005 - Computer Engineering Faculty, University of Florence, Italy

**Information and Communication Technology**, 2004 and 2005 - Agriculture Faculty, University of Florence, Italy

**E-government guidelines for Public Administration**, 2003 - Master in Communication and Management, University of Florence, Italy

**Instructor for Cisco Networking Academy Program**, 2003 - Master in Internet Engineering, University of Florence, Italy

## TECHNICAL SKILLS

**Semantic Web** – Definition, design and analysis of ontologies,. Good knowledge of **OWL, RDF, RDFS, SPARQL** . Very good knowledge of **Protégé**, and **Jena** API

**Web Development**: Very good knowledge of HTML, XHTML, XML, CSS, RSS. Very familiar with **LAMP sites development**. Very good knowledge of Javascript, PHP. Good knowledge of the **Adobe CS Suite** (Dreamweaver, Flash, Fireworks, Photoshop)

**Web Engineering and Networking**: Good knowledge of Apache, Microsoft IIS. Very good knowledge of **Apache**. Certified **Cisco CCNA Instructor**. Good knowledge of **Cisco IOS**, Cisco routers and switches configuration and management, design of LAN/WAN

**Programming Languages and Mark-up**: Good knowledge of C, C++, Java. Very good knowledge of XML, XSL(T), , SQL, SPARQL, MPEG-7, MPEG-21

## LANGUAGES

Italian (native), English and French

## INTERESTS

Squash, Surf, Movies, Book, Music: (indie rock), videogames