

Curriculum Vitae et Studiorum

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Personal Information

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Current Position

since february 23, 2015 Associate Professor in the Scientific and learning sector ING-INF/05 (09/H1) - Information Systems. Formerly -since december 30, 2008- Assistant Professor

since july 26, 2018 National Scientific Qualification as Full Professor according to the provision of law n. 240/2010, art. 16 for the competition sector 09/H1-Information Systems (ING-INF/05). Formerly -since december 3, 2013- qualification as Associate Professor

since august 07, 2018 National Scientific Qualification as Full Professor according to the provision of law n. 240/2010, art. 16 for the competition sector 01/B1-Computer Science (INF/01). Formerly -since january 19, 2015- qualification as Associate Professor

Scientific activity in short

My research activity is mainly focused on the application of knowledge representation techniques and technologies to resource-constrained and unpredictable systems. Particularly, I have investigated the possibility of adopting these techniques and tools to mobile and ubiquitous computing and to the Internet of Things. This interest has been fostered –on one hand– after verifying the incompleteness and inadequacy of most common service/resource discovery technologies if applied in volatile and unpredictable contexts. On the other hand, it is evident that is strongly needed a revision of some ideas and approaches of classic Knowledge Representation in order to comply with novel scenarios: it is required a systematic redesign aiming to apply them to highly flexible structures and systems which are also unstable and computationally limited. With these premises, my research interests have been directed to: i) study and test novel methods and protocols for the semantic-enhanced resource discovery for the ubiquitous computing, ii) to analyze performances and perform optimization in terms of efficiency and quality of service, iii) to devise techniques and algorithms for the automated reasoning to be applied to distributed knowledge bases. Basically, in these years I have worked to several testbeds based on Bluetooth piconets, Wi-Fi, on the RFID or ZigBee protocols for objects networks and finally on KNX and LonWorks for complex control and actuation networks. More recently I have also investigated the Blockchain technology.

1 Education

Ph.D. in Information Engineering. Polytechnic University of Bari. June 13, 2007.
Dissertation title: *Knowledge Representation and Management Methods for Mobile Systems and Contexts* [142]. Tutor: Proff. G. Piscitelli, E. Di Sciascio. My Ph.D. dissertation is focused on the adoption of knowledge representation techniques and technologies to improve the service discovery in application protocols of current wireless and mobile standards.

License to practice Engineering. I'm enrolled in the Engineers register of Bari since January 21, 2004.

Laurea in Electronic Engineering. Polytechnic University of Bari. December 17, 2002.
Dissertation title: *Design and development of an IP-based tele-control system*[143]. Supervisors: Proff. G. Piscitelli, E. Di Sciascio, Dr. T. Ricci (Getronics S.p.A.). This work is one of the early examples of IP-based control networks. It adopted the application protocol LonWorks by Echelon Corp. within a UDP/IP network to implement a prototypical industrial application.

Diploma High school "Orazio Tedone" - Ruvo di Puglia. July 1994.

2 Research Interests

My research activity, started in 2003 soon after my graduation, has been mainly developed at Polytechnic University of Bari in the Information Systems Laboratory research group (<http://sisinflab.poliba.it/>).

Main research topics I have been investigating are listed in what follows.

2.1 Research topics

- **Semantic-based Resource discovery** (see [116, 141, 22, 110, 140, 20, 19, 107, 18, 82, 73, 70, 11, 61, 60, 56, 42]). In order to improve mobile discovery mechanisms there has been the idea –proposed for the first time in 2002 by Avancha et al.– of replacing techniques based on numeric service identifiers (as in Bluetooth) with tools borrowed from the Semantic Web. Starting from my Ph.D. course, I have devised and implemented a discovery mechanism based on resource annotation and on the exploitation of logic-oriented matchmaking. By means of a semantic facilitator, it is possible to select one or more resources able to satisfy a query also not completely. By leveraging the semantics associated to descriptions, that facilitator replies with a list in relevance order of resources best covering the original request. The peculiarity is basically in integrating advanced matchmaking tools and non-standard inference services in a semantic layer to be put on the top of the Service Discovery Protocol (SDP) of the original stack. It is completely ensured the full reuse of legacy features of a protocol (backward compatibility) preserving unchanged all the basic characteristics. Before modifying each Service Discovery Protocol, all possible variants have been software simulated in order to evaluate their impact on the turnaround time, computational load and bandwidth with respect to the original stack. Obtained results have been quite encouraging.
- **Resource composition/orchestration/substitution** (see [115, 108, 105, 104, 103, 122]). The idea behind this approach is to extend to mobile systems and environments a fully developed system for the organization, composition and possibly substitution of available services, in order to cover user requests as much as possible. With particular reference to a mobile context, in literature attempts can be

found primarily oriented at transferring the theoretical framework of the already mature applications in the field of Web Services: nevertheless, interfacing mobile devices (with inherent memory, battery drain and computational capability issues) with knowledge bases and inference engines showed immediately the technological limitations of this kind of approaches. Studies and analyses I have carried out have primarily lead to the definition of a novel protocol paradigm allowing for the composition according to the IOPE (Input/Output/Preconditions/Effects) model, also providing substitutability sub-classes in case of zombie resources/services. It means that within the set of component services of a complex mobile service, it is possible to identify in a fully automatic way substitute services for each set element, which can be replaced with the “first-string” service without impairment of the execution phase. The identification of substitutability classes is an extremely important feature in any kind of volatile context. It is indeed remarkable that, in order to guarantee the quality of service and the continuity of provisioning, a component service can be replaced if it has dynamically changed its characteristics so as to become unavailable or unfit for request satisfaction. The presence of an analogous substitute service allows to keep unchanged and, most importantly, to avoid jeopardizing the previous processing steps.

- **Mobile reasoning** (see [21, 102, 101, 97, 92, 90, 89, 139, 86, 85, 14, 81, 78, 132, 71, 10, 67, 34, 65, 53, 33, 43]). A relevant role in a decentralized architecture for knowledge representation is covered by a reasoning system for mobile devices, providing a set of non-standard inference services adopted for ranking resources and services discovered in a given environment. Hence, I have worked formerly to a matchmaker prototype based on structural algorithms and object-oriented databases. Afterwards, I have attempted to implement the first mobile matchmaker able to implement standard and non-standard inference services of abduction, contraction and covering in ubicomp scenarios. There are several versions now and particularly for Android and iOS operating systems.
- **u-KRS: ubiquitous Knowledge Representation Systems** (see [17, 15, 83, 37, 76, 51, 49]). The mobile reasoning framework provides the first architectural and functional elements of an infrastructure for the management and the exploitation of ubiquitous Knowledge Bases (u-KBs). In order to realize this infrastructure completely, it is needed to allow a transparent access to small-size knowledge bases distributed across different nodes in a mobile ad-hoc network. Since information concerning resources of interest can be physically tied to the resources themselves, it is desirable to avoid imposing a centralization of information to manage procedures required by applications. In a u-KB every node will be responsible of a part of the knowledge base individuals. In the same way, queries on the knowledge base will need to allow a complete access to information elements as much as possible, as if they were stored centrally.
- **Semantic Web of Things** (see [111, 106, 95, 138, 79, 74, 62, 57, 52, 50, 47, 7, 121, 45, 4, 119, 117]). This term has been thought in 2009. The main goal of this research topic has been the high level integration not only among users, but between users and objects and objects among them, taking into account all the problems stemming from the mobility of both. Also in this case, information will be managed by means of knowledge representation technologies derived from the Semantic Web. First of all, an in-depth analysis has been conducted on methods for the extension of current technological standards in order to support the storage on-board the networked objects and the suitable extraction of proper descriptions of them and of the context they are dipped in. Furthermore, methodologies have

been defined for the application-level integration of wireless technologies and different mobile service discovery protocols, in order to create a unified framework capable to support advanced resource discovery. Theoretical studies have led to the implementation of an articulated test bed within a simulation platform and it has been also proven as extension of the Google Physical World framework. The object (b)logging term has been coined to denote this novel propensity of objects to recognize the context they dwell in (even as it evolves) and to offer advanced and semantically unambiguous descriptions of their "status" to those who interrogate them. This high-level information is directly accessible by any capable distributed system the object is located in: it is unnecessary any large-scale telematic support infrastructure. In order to support the real feasibility of that approach, the severe constraints of storage and computational resources of current mobile devices have been taken into account, as well as the limited transmission capacity allowed by protocols for low-power wireless ad-hoc networks. One of the most relevant problem is verbosity of annotation languages (based on XML). To this aim a specific algorithm to compress semantic annotations has been conceived, designed and implemented, with the capability to support the storage of a medium complexity description even on an RFID transponder. There exists also a homomorphic extension of the algorithm to support information queries and updates directly on the compressed format, without the need for decompression.

- **Control networks and building automation** (see [84, 13, 80, 135, 134, 36, 131, 35, 12, 128, 127, 124, 8, 48, 123, 120, 3]). This research application is basically a verification scenario for theoretical studies carried on the adoption of knowledge representation techniques to critical contexts. In the building automation, the environmental control is realized by exploiting pre-programmed procedures. There are several ways to configure such systems, but classical approaches have the limit that every user-context interaction must be necessarily programmed at the system set-up stage. In order to make such architectures more dynamic and flexible, knowledge engineering technologies can be applied to control networks. In particular, by endowing building automation systems with knowledge representation and management capabilities, it is possible to make them able to execute implicit logical deductions starting from an explicit representation of both context and user requests. Carried out experiments have been conducted to the extension of two of the most widespread open and interoperable standards for building automation (i.e., EIB/KNX and Echelon LonWorks) and to the implementation of a social network of home appliances. It has been also realized a concrete implementation tested successfully in a real household.
- **Content-based networking** (see [96, 16]). Another research topic has been the integration of a semantic service/resource discovery layer with the routing one within the ISO/OSI model for performance improvement of a mobile ad-hoc network (in terms of hit and delivery ratio, as well as of reduction of delivery delay). This can provide a contribution to the realization of content-based networking, as envisioned by Van Jacobson in 2009, by exploiting artificial intelligence techniques. It has been defined a suitable protocol (802.11 has been chosen as basic communication framework), capable of granting an effective dissemination of data required to retrieve a posteriori the services and/or resources in an on-demand fashion. This protocol is based on the reuse of service discovery information for network layer signaling, in order to reduce the overhead induced by routing procedures: there is a substantial similarity of many application-layer procedures with network-layer and transport-layer ones. Carried experiments have shown interesting results in terms of both quality of service enhancement and routing performance. The pro-

posed framework has been also modified and simplified for emerging applications as the ones for wireless semantic sensor networks and mobile grids. It has been also studied and implemented a variant of ZigBee protocol for sensor and actor networks and mobile semantic grids.

- **E-Commerce** (see [41, 114, 23, 112, 109, 98, 94, 88, 46]). Among possible semantic-based resource retrieval scenarios, the electronic commerce in mobile and peer-to-peer contexts is one of the most interesting. It allows to leverage the notion of incomplete information which typical of the early stages of semantic-based resource and service discovery.
- **Skill management** (see [40, 100, 39, 133]). Skill management issues I have considered in my research activity are mostly focused on the task assignment and on the automatic course composition for e-learning scenarios. There have been proposed solutions adopting ontology-based systems for skill and competences classification of employees in a given organization in order to compare them with the description of the job/task to be covered. This matchmaking also allows to select best candidates to compose a team able to solve complex problems. This theoretical approach has been implemented in the commercial tool named I.M.P.A.K.T..
- **Machine Learning** (see [38, 136, 130, 68, 66, 125, 55, 54, 44, 2]). For what concerns studying and application of machine learning techniques, there has been proposed an optimization of algorithms in literature oriented to not-supervised clustering of data, where knowledge representation has been adopted to improve the accuracy.
- **Model Checking** (see [25, 24]). The study and analysis of formal models is an interest I have kept along these years. Basically, I have early investigated the Model Checking as tool for detecting anomalies in articulated software systems. More recently I have surveyed a possible integration between formal models with semantic representation of information in order to identify failures and inefficiencies in complex real systems in a proper and accurate way.
- **Decision/actuation support in healthcare** (see [99, 93, 129, 72, 9, 59, 5, 1]). The adoption of knowledge representation for healthcare discloses interesting possibilities. This is true for diagnosis support and therapy verification, but also for actuating feedback on the human body after a inferential deduction on given biosignals properly annotated.
- **Infomobility** (see [113, 91, 87, 137, 77, 75, 69, 63, 126, 64, 58, 6, 118]). It is a complex scenario where user-generated information is integrated with the environmental one and with the one coming from vehicles (if present). The interaction user-(vehicle)-context produces really rich data, but with high variability. Hence, it is interesting to extract from them a local control through proper knowledge management schemes. It is also relevant the possibility of propagating high level information (locally integrated and inferred) towards peripheral nodes of nomadic networks. There have been studied applications for both data fusion and advanced cartography purposes.

3 Awards

- **Design contest** for six subsidized, experimental buildings leveraging domotic systems, within the "Contratto di Quartiere - Borgo La Martella" initiative in Matera. First placed

- **Best Paper Award** at the 9th International Conference on Electronic Commerce ICEC 2007 for the paper "RFID Meets Bluetooth in a Semantic Based U-commerce Environment" [109]
- **AICA-CSIT 2006 Award** to the Master thesis of Dr. Floriano Scioscia supervised by me. Best thesis in the ICT sector
- **Best Paper Award** at the 4th International Conference on Advances in Semantic Processing SEMAPRO 2010 for the paper "Semantic-based Geographical Matchmaking in Ubiquitous Computing" [92]
- **Award of 56th National Congress of Engineers Professional Order** to the Master thesis of Dr. Nicola De Leo supervised by me. Best thesis in the ICT sector
- **KNX Awards 2012** -"Special" category- at the Light+Building 2012 international exhibition in Frankfurt. Finalist with the project "Semantic Web of Things at Home with KNX"
- **Google Internet of Things (IoT) Technology Research Award** for the research proposal "Physical Semantic Web"
- **Challenge Prize** of the "Nice to Meet You" initiative of the ItaliaCamp association supported by the Italian Ministry of Transport and Infrastructures. Finalist (selected among more than 200 applications) with a prototypical information system for the National Maritime Single Window named ARGES and developed within the EU E.T.C.P. project of the same name
- **Best Reviewer Award** at the 16th International Semantic Web Conference (ISWC 2017)

4 Invited talks, Tutorial, Seminars

- **Keynote talk** at UBICOMM 2010 - The 4th International Conference on Mobile Ubiquitous Computing, Systems, Services and Technologies. Title "If Objects Could Talk: novel resource discovery approaches in pervasive environments"
- **Panel** at SEMAPRO 2010 - The 4th International Conference on Advances in Semantic Processing. Topic: "Advanced and Semantic Computing for Complex Situations"
- **Keynote talk** at 2012 AIXIA Symposium on Artificial Intelligence
- **Invited talk** at 2nd Green City Energy Forum. Title: "Knowledge representation methods for intelligent buildings and smart cities"
- **Panel** at SEMAPRO 2016 - The 10th International Conference on Advances in Semantic Processing. Topic: "The Internet of Everything: Challenges of Web of Things in Smart Cities"
- **Keynote talk** at 1st International Congress on ICT in Cardiology
- **Invited talk** at I Congresso di Telemedicina e Sanità Digitale - Scenari innovativi nei percorsi organizzativi e nei PDTA
- **Keynote talk** at ICCBB 2018 - The 2nd International Conference on Computational Biology and Bioinformatics

5 Editorial and organizational activity

Editorial Board:

- International Journal on Advances in Intelligent Systems (pub. International Academy, Research and Industry Association (IARIA))
- International Journal on Advances in Internet Technology (pub. International Academy, Research and Industry Association (IARIA))
- Book on Smart Manufacturing Innovation and Transformation: Interconnection and Intelligence (pub. IGI Global and Scopus indexed)
- Book series on Artificial Intelligence, Computer Engineering, Theoretical Computer Science, Web Technologies di CyberTech Publishing
- Mobile Information Systems (pub. Hindawi and Scopus indexed) - SJR 2017: 0.224, CiteScore 2017: 1.13, JCR IF 2017: 0.958
- Book series on Advances in Web Technologies and Engineering (pub. IGI Global)
- Book collection Research Insights (pub. IGI Global)
- International Journal of Green Computing (pub. IGI Global)

Guest/Associate Editor:

- International Journal of Information Technology and Web Engineering (pub. IGI Global and Scopus indexed) - SJR 2017: 0.168, CiteScore 2017: 0.64

Chair/Organizer:

- 2nd International Conferences on Advanced Service Computing (Service Computation 2010). Co-organizer and advisory chair
- 1st International Workshop on Semantic based Opportunistic Data Management (SODM 2011) (in conjunction with the 12th International Conference on Mobile Data Management (MDM 2011)) - Proceedings pub. IEEE and Scopus indexed [32]. Co-organizer and general chair
- 3rd International Conferences on Advanced Service Computing (Service Computation 2011). Co-organizer e advisory chair
- 5th International Conference on Mobile Ubiquitous Computing, Systems, Services and Technologies (UBICOMM 2011) - Proceedings pub. ThinkMind (ed. IARIA XPS Press) and Scopus indexed. Co-organizer e research chair
- 4th International Conferences on Advanced Service Computing (Service Computation 2012). Co-organizer and advisory chair
- 6th International Conference on Mobile Ubiquitous Computing, Systems, Services and Technologies (UBICOMM 2012) - Proceedings pub. ThinkMind (ed. IARIA XPS Press) and Scopus indexed [31]. Co-organizer and research chair
- 7th FTRA International Conference on Multimedia and Ubiquitous Engineering (MUE 2013) - Proceedings pub. Lecture Notes in Electrical Engineering (ed. Springer) and Scopus indexed. Co-organizer and publicity chair

- 5th International Conferences on Advanced Service Computing (Service Computation 2013). Co-organizer e advisory chair
- 3rd International Symposium on Internet of Ubiquitous and Pervasive Things (IUPT 2013) (in conjunction with Ambient Systems, Networks and Technologies Conference (ANT 2013)) - Proceedings pub. Procedia Computer Science (ed. Elsevier) and Scopus indexed [29]. Co-organizer and general chair
- 7th International Conference on Mobile Ubiquitous Computing, Systems, Services and Technologies (UBICOMM 2013) [30]. Co-organizer and research chair
- 6th International Conferences on Advanced Service Computing (Service Computation 2014). Co-organizer and advisory chair
- 8th FTRA International Conference on Multimedia and Ubiquitous Engineering (MUE 2014) - Proceedings pub. Lecture Notes in Electrical Engineering (ed. Springer) and Scopus indexed. Co-organizer and workshop chair
- 1st International Workshop Toward Emerging Technology for Harbour sYstems and Services (TETHYS 2014) [28]. Co-organizer and general chair
- 8th International Conference on Mobile Ubiquitous Computing, Systems, Services and Technologies (UBICOMM 2014). Co-organizer and research chair
- 7th International Conferences on Advanced Service Computing (Service Computation 2015). Co-organizer and advisory chair
- 9th International Conference on Mobile Ubiquitous Computing, Systems, Services and Technologies (UBICOMM 2015). Co-organizer and research chair
- 2nd International Workshop Toward Emerging Technology for Harbour sYstems and Services (TETHYS 2015) [27]. Co-organizer and general chair
- 8th International Conferences on Advanced Service Computing (Service Computation 2016). Co-organizer and advisory chair
- 10th International Conference on Mobile Ubiquitous Computing, Systems, Services and Technologies (UBICOMM 2016) [26]. Co-organizer and research chair
- 1st International Workshop on Semantic Opportunistic Object Networks (SOON 2016) co-located with the 10th International Conference on Advances in Semantic Processing (SEMAPRO 2016). Co-organizer and general chair
- 3rd International Workshop Toward Emerging Technology for Harbour sYstems and Services (TETHYS 2016), co-located with the 10th International Conference on Mobile Ubiquitous Computing, Systems, Services and Technologies (UBICOMM 2016). Co-organizer and general chair
- 9th International Conferences on Advanced Service Computing (Service Computation 2017). Co-organizer and steering committee member
- 7th International Symposium on Internet of Ubiquitous and Pervasive Things (IUPT 2017) (in conjunction with Ambient Systems, Networks and Technologies Conference (ANT 2017)) - Proceedings pub. Procedia Computer Science (ed. Elsevier) and Scopus indexed. Co-organizer and program chair
- 3rd Italian Conference on ICT for Smart Cities and Communities (I-CiTies 2017). Co-organizer and general co-chair

- 11th International Conference on Mobile Ubiquitous Computing, Systems, Services and Technologies (UBICOMM 2017). Co-organizer and steering committee member
- 10th International Conferences on Advanced Service Computing (Service Computation 2018). Co-organizer and steering committee member
- 8th International Symposium on Internet of Ubiquitous and Pervasive Things (IUPT 2018) (in conjunction with Ambient Systems, Networks and Technologies Conference (ANT 2018)) - Proceedings pub. Procedia Computer Science (ed. Elsevier) and Scopus indexed. Co-organizer and program chair
- 4th Italian Conference on ICT for Smart Cities and Communities (I-CiTies 2018). Co-organizer and general co-chair
- 12th International Conference on Mobile Ubiquitous Computing, Systems, Services and Technologies (UBICOMM 2018). Co-organizer and steering committee member
- 11th International Conferences on Advanced Service Computing (Service Computation 2019). Co-organizer and steering committee member
- 9th International Symposium on Internet of Ubiquitous and Pervasive Things (IUPT 2019) (in conjunction with Ambient Systems, Networks and Technologies Conference (ANT 2019)) - Proceedings pub. Procedia Computer Science (ed. Elsevier) and Scopus indexed. Co-organizer and program chair
- 13th International Conference on Mobile Ubiquitous Computing, Systems, Services and Technologies (UBICOMM 2019). Co-organizer and steering committee member
- The 2019 IEEE Conference on Systems, Man, and Cybernetics (SMC 2019). Co-organizer and special sessions chair

Program Committee:**2007**

- UBICOMM 2007 - The 1st International Conference on Mobile Ubiquitous Computing, Systems, Services and Technologies

2008

- UBICOMM 2008 - The 2nd International Conference on Mobile Ubiquitous Computing, Systems, Services and Technologies
- KES 2008 - The 12th International Conference on Knowledge-Based & Intelligent Information & Engineering Systems - Invited Session: Engineered Applications of Semantic Web - SWEA
- EC-Web 2008 - The 9th International Conference on Electronic Commerce and Web Technologies

2009

- Service Computation 2009 - The 1st International Conference on Advanced Service Computing
- UBICOMM 2009 - The 3rd International Conference on Mobile Ubiquitous Computing, Systems, Services and Technologies
- DCDS 2009 - The 2nd IFAC Workshop on Dependable Control of Discrete Systems

2010

- Service Computation 2010 - The 2nd International Conference on Advanced Service Computing
- SEMAPRO 2010 - The 4th International Conference on Advances in Semantic Processing
- UBICOMM 2010 - The 4th International Conference on Mobile Ubiquitous Computing, Systems, Services and Technologies
- WOA 2010 - Undicesimo Workshop Nazionale “Dagli Oggetti agli Agenti”
- ICMB/GMR 2010 - The 9th International Conference on Mobile Business and the 9th Global Mobility Roundtable

2011

- SEMAPRO 2011 - The 5th International Conference on Advances in Semantic Processing
- UBICOMM 2011 - The 5th International Conference on Mobile Ubiquitous Computing, Systems, Services and Technologies
- ATI 2011 - The 1st International Workshop on Ambient Things on the Internet (co-located with WISE 2011)
- Service Computation 2011 - The 3rd International Conference on Advanced Service Computing
- AFIN 2011 - The 3rd International Conference on Advances in Future Internet
- WOA2011 - Dodicesimo Workshop Nazionale “Dagli Oggetti agli Agenti”
- SSW 2011 - The 1st International Workshop on Semantic Search Over the Web (co-located with CAiSE 2011)

2012

- SEMAPRO 2012 - The 6th International Conference on Advances in Semantic Processing
- UBICOMM 2012 - The 6th International Conference on Mobile Ubiquitous Computing, Systems, Services and Technologies
- WOA 2012 - Tredicesimo Workshop Nazionale “Dagli Oggetti agli Agenti”
- IUPT 2012 - The 2nd International Workshop on Internet of Ubiquitous and Pervasive Things (co-located with ANT 2012)
- AFIN 2012 - The 4th International Conference on Advances in Future Internet
- Service Computation 2012 - The 4th International Conference on Advanced Service Computing

- ICMB 2012 - The 11th International Conference on Mobile Business

2013

- EUSPN 2013 - The 4th International Conference on Emerging Ubiquitous Systems and Pervasive Network
- SEMAPRO 2013 - The 7th International Conference on Advances in Semantic Processing
- UBICOMM 2013 - The 7th International Conference on Mobile Ubiquitous Computing, Systems, Services and Technologies
- AFIN 2013 - The 5th International Conference on Advances in Future Internet
- IWASI 2013 - The 5th IEEE International Workshop on Advances in Sensors and Interfaces
- Service Computation 2013 - The 5th International Conference on Advanced Service Computing

2014

- AFIN 2014 - The 6th International Conference on Advances in Future Internet
- SEMAPRO 2014 - The 8th International Conference on Advances in Semantic Processing
- UBICOMM 2014 - The 8th International Conference on Mobile Ubiquitous Computing, Systems, Services and Technologies
- TETHYS 2014 - The 1st International Workshop Toward Emerging Technology for Harbour sYstems and Services
- Service Computation 2014 - The 6th International Conference on Advanced Service Computing

2015

- ANT 2015 - The 6th International Conference on Ambient Systems, Networks and Technologies
- IUPT 2015 - The 5th International Symposium on Internet of Ubiquitous and Pervasive Things (co-located with ANT 2015)
- Service Computation 2015 - The 7th International Conference on Advanced Service Computing
- IWASI 2015 - The 6th IEEE International Workshop on Advances in Sensors and Interfaces
- SEMAPRO 2015 - The 9th International Conference on Advances in Semantic Processing
- UBICOMM 2015 - The 9th International Conference on Mobile Ubiquitous Computing, Systems, Services and Technologies
- MODEST 2015 - The 1st Workshop on Mobile Deployment of Semantic Technologies (co-located with ISWC 2015)
- TETHYS 2015 - The 2nd International Workshop Toward Emerging Technology for Harbour sYstems and Services

2016

- Service Computation 2016 - The 8th International Conference on Advanced Service Computing
- SEMAPRO 2016 - The 10th International Conference on Advances in Semantic Processing
- UBICOMM 2016 - The 10th International Conference on Mobile Ubiquitous Computing, Systems, Services and Technologies
- SPLITECH 2016 - The 1st International Multidisciplinary Conference on Computer and Energy Science
- IUPT 2016 - The 6th International Symposium on Internet of Ubiquitous and Pervasive Things (co-located with ANT 2016)
- MODEST 2016 - The 2nd Workshop on Mobile Deployment of Semantic Technologies (co-located with ISWC 2016)
- ADMA 2016 - The 12th International Conference on Advanced Data Mining and Applications

2017

- WORLDCIST 2017 - The 5th World Conference on Information Systems and Technologies
- Service Computation 2017 - The 9th International Conference on Advanced Service Computing
- SPLITECH 2017 - The 2nd International Multidisciplinary Conference on Computer and Energy Science
- ICIT 2017 - The 16th International Conference on Information Technology
- IWASI 2017 - The 7th IEEE International Workshop on Advances in Sensors and Interfaces
- ISWC 2017 - The 16th International Semantic Web Conference
- SEMAPRO 2017 - The 11th International Conference on Advances in Semantic Processing
- UBICOMM 2017 - The 11th International Conference on Mobile Ubiquitous Computing, Systems, Services and Technologies
- IoT-ITSL 2017 - The 1st International Workshop on IoT applications in Intelligent Transportation Systems and Logistics (co-located with SOLI 2017)
- UCIOT 2017 : The 1st International Workshop on Utility Clouds for IoT (co-located with UCC 2017)
- ADMA 2017 - The 13th International Conference on Advanced Data Mining and Applications

2018

- Service Computation 2018 - The 10th International Conference on Advanced Service Computing
- SEMAPRO 2018 - The 12th International Conference on Advances in Semantic Processing

- UBICOMM 2018 - The 12th International Conference on Mobile Ubiquitous Computing, Systems, Services and Technologies
- WF-5G 2018 - The 1st IEEE 5G World Forum
- WORLDCIST 2018 - The 6th World Conference on Information Systems and Technologies
- ESWC 2018 - The 15th Extended Semantic Web Conference
- ICCGI 2018 - The 13th International Multi-Conference on Computing in the Global Information Technology
- WWW 2018 - The 27th International World Wide Web Conference
- GLOBECOM 2018 - The 37th IEEE Global Communications Conference
- ISWC 2018 - The 17th International Semantic Web Conference
- JIST 2018 - The 8th Joint International Semantic Technology Conference
- COMNETSAT 2018 - The 7th IEEE International Conference on Communication, Networks and Satellite
- AEIT 2018 - The 110th AEIT International Annual Conference

2019

- SMC 2019 - The 2019 IEEE Conference on Systems, Man, and Cybernetics
- Service Computation 2019 - The 11th International Conference on Advanced Service Computing
- WORLDCIST 2019 - The 7th World Conference on Information Systems and Technologies
- GLOBECOM 2019 - The 38th IEEE Global Communications Conference
- WWW 2019 - The 28th International World Wide Web Conference
- ICCGI 2019 - The 14th International Multi-Conference on Computing in the Global Information Technology
- BLOCKCHAIN 2019 - The 2nd IEEE International Conference on Blockchain
- KOGPIT 2019 - The 1st Workshop on Best Practices and Dynamic Knowledge Graphs (co-located with KGSWC 2019)
- IWASI 2019 - The 8th IEEE International Workshop on Advances in Sensors and Interfaces
- HUSO 2019 - The 5th International Conference on Human and Social Analytics
- WF-5G 2019 - The 2nd IEEE 5G World Forum
- COMNETSAT 2019 - The 8th IEEE International Conference on Communication, Networks and Satellite
- SEMAPRO 2019 - The 13th International Conference on Advances in Semantic Processing
- UBICOMM 2019 - The 13th International Conference on Mobile Ubiquitous Computing, Systems, Services and Technologies
- AMBIENT 2019 - The 9th International Conference on Ambient Computing, Applications, Services and Technologies
- ISWC 2019 - The 18th International Semantic Web Conference

- WI 2019 - The 18th IEEE/WIC/ACM International Conference on Web Intelligence
- MTSR 2019 - The 13th International Conference on Metadata and Semantics Research (Special Track on Metadata, Identifiers and semantics in Decentralized Applications, Blockchains and P2P systems)

Reviewer:**International Journals and Book Chapters**

- Earth Science Informatics (Springer)
- IEEE Intelligent Systems
- Information Systems Frontiers (Springer)
- Smart Manufacturing Innovation and Transformation: Interconnection and Intelligence (IGI Global)
- Arabian Journal for Science and Engineering (Springer)
- IEEE Transactions on Parallel and Distributed Systems
- IEEE Sensors Journal
- Journal of Computing and Information Technology (CIT)
- IEEE Transactions on Vehicular Technology
- IEEE Transactions on Industrial Informatics
- International Journal of Applied Logistics (IGI Global)
- Journal of Medical Systems (Springer)
- IEEE Transactions on Industrial Electronics
- Journal of Network and Computer Applications (Elsevier)
- Neural Computing and Applications (Springer)
- Unique Radio Innovation for the 21st Century - Building Scalable and Global RFID Networks (Springer)
- IEEE Communications Magazine feature topic on Situation Management
- Encyclopedia of E-Business Development and Management in the Digital Economy (IGI Global)
- Multiplatform E-Learning Systems and Technologies: Mobile Devices for Ubiquitous ICT-Based Education (IGI Global)
- Ad Hoc Networks (Elsevier)
- Future Internet (MDPI)
- International Journal of Sensor Networks (Inderscience)
- Pervasive and Mobile Computing (Elsevier)
- International Journal on Semantic Web and Information Systems (IGI Global)
- Applied Computing and Informatics (Elsevier)
- Neurocomputing (Elsevier)
- IEEE Transactions on Big Data
- Journal of Ambient Intelligence and Humanized Computing (Springer)
- Software: Practice and Experience (Wiley)
- International Journal of Green Computing (IGI Global)

Conferences and Workshops

- ISIE - IEEE International Symposium on Industrial Electronics
- ICDCS - International Conference on Distributed Computing Systems
- SoftCOM - International Conference on Software, Telecommunications and Computer Networks
- EC-Web - International Conference on Electronic Commerce and Web Technologies
- ICEC - International Conference on Electronic Commerce
- SAC - ACM Symposium on Applied Computing
- ISWC - International Semantic Web Conference
- ESWC - Extended Semantic Web Conference
- The Web Conference (formerly WWW)
- GLOBECOM - IEEE Global Communications Conference

6 Research projects

Principal Investigator/Scientific Supervisor

- UBI-CARE (UBIquitous knowledge-oriented healthCARE), funds Apulia POR FESR 2007-13. Supervisor for Polytechnic University of Bari
- BRIKS (BRInging Knowledge to Smart grids: a semantic- based approach), funds Polytechnic University of Bari research budget. Principal Investigator
- DEPASAS (Dematerialization of administrative processes and students' services), funds Ministry of Education, University and Research according to provision of law D.M. 15/10/2013 n.827 - art. 4. Principal Investigator
- PERSON (PERvasive game for perSONalized treatment of cognitive and functional deficits associated with chronic and Neurodegenerative diseases), funds Apulia POR FESR 2007-13, call for support to regional technological clusters. Supervisor for Polytechnic University of Bari
- WISEWATER (WIreless SystEm for WATER leakage detection and condition monitoring), funds Apulia POR FSC 2007-13, call for OpenLabs: monitoring and leakage detection in the primary and distribution network. Supervisor for the Information Engineering Research Unit of Polytechnic University of Bari
- COMPETiTiVE (Claims of Olive oil to iMProVE The market ValuE of the product), funds AGER (network of foundations for the agrifood research), 2nd call for "Olive tree and olive oil". Supervisor for the Information Engineering Research Unit of Polytechnic University of Bari
- Apulia CPS/IoT Hub for Regional Digital Manufacturing SME's - Apulia Manufacturing RDMI Hub, funds EU, call I4MS "Feasibility for Regional Digital Manufacturing Innovation Hubs". Supervisor for Polytechnic University of Bari

- ERHA (Enhanced Radiotherapy With HAdrons), funds Sustainable Growth, call Horizon 2020 - PON I&C 2014-2020. Supervisor for the Information Engineering Research Unit of Polytechnic University of Bari
- BeFree@Campus 2.0 (Barrier and Exclusion-free at university Campus ver. 2.0), funds Polytechnic University of Bari research budget. Principal Investigator
- Si-Ca.Re (Integrated system to monitor and care patients with cardio-renal syndroms), funds Apulia POR FESR-FSE 2014-2020, call INNONETWORK: Support to R&D activities for developing new sustainable technologies, products and services. Supervisor for Polytechnic University of Bari
- C-Lab 4.0 (Competences Lab for Industry 4.0), funds Apulia POR FESR-FSE 2014-2020, call INNOLABS: Support to creation of innovative solutions aimed at specific socially relevant issues. Supervisor for Polytechnic University of Bari
- PORTS (Partnership for the Observation and study of new Routes and Transnational Sea-highways), funds EU Interreg IPA CBC Italy-Albania-Montenegro 2014-2020. Supervisor for Polytechnic University of Bari
- FURTHER (FUture Revolutionary Technologies for Hybrid Electric aiRcrafts), funds PON Research and Innovation - National Research Program (PNR) 2015-2020 - Specialization area: Aerospace. Supervisor for the Information Engineering Research Unit of Polytechnic University of Bari
- RPASinAir (Integration of Remotely Piloted Aircraft Systems in a not limited aerial space for innovative civil services), funds PON Research and Innovation - National Research Program (PNR) 2015-2020 - Specialization area: Aerospace. Supervisor for the Information Engineering Research Unit of Polytechnic University of Bari
- VASARI (VALORIZATION of the italian cultural heritage through SmARt services), funds PON Research and Innovation - National Research Program (PNR) 2015-2020 - Specialization area: Cultural heritage. Supervisor for Polytechnic University of Bari
- AMICO (Medical assistance in contextual awareness), funds PON Research and Innovation - National Research Program (PNR) 2015-2020 - Specialization area: Technologies for ambient assisted living. Supervisor for the Information Engineering Research Unit of Polytechnic University of Bari
- NSG (New Satellites Generation components), funds PON Research and Innovation - National Research Program (PNR) 2015-2020 - Specialization area: Aerospace. Supervisor for the Information Engineering Research Unit of Polytechnic University of Bari
- RAFAEL (System for risk forecasting and management in critical infrastructures of the south of Italy), funds PON Research and Innovation - National Research Program (PNR) 2015-2020 - Specialization area: Smart Secure and Inclusive Communities. Supervisor for the Information Engineering Research Unit of Polytechnic University of Bari

Participant

- CNOSSO (Novel technologies for the enhancement and the fruition of cultural heritage), funds PON Research 2000-06

- PITAGORA (Telematic Platform for Information and Management of Public Transportation Systems), funds FAR according to the provision of law 297/1999
- TOWL (Time-determined ontology based information system for real time stock), funds EU FP-6 IST STREP
- IC Technologies for tracking agrifood products equipped with RFID tags - PE074, funds exploratory projects Apulia region
- Acquiring and managing knowledge on customers to increase competitiveness: innovative models of customer profiling - PE013, funds exploratory projects Apulia region
- IC Technologies for tourist assistance through an interactive virtual guide - PE082, funds exploratory projects Apulia region
- ACAB-C2 (System for Automated Composition of business processes in ERPs using Abduction-based Concept Covering) - PE043, funds exploratory projects Apulia region
- L'OrMaICT (ICT supporting logistic services: a model of ORganized MARket) - PS025, funds strategic projects Apulia region
- Telecommunication Facilities and Wireless Sensor Networks in Emergency Management - PS121, funds strategic projects Apulia region
- DIPIS (Distributed Production as Innovative System) - PS092, funds strategic projects Apulia region
- BOD (Bus On Demand), funds Apulia POR 2000-06, provision 6.2 action C
- ITINERA (Information Technologies for promotion, e-learning and research in archaeology), funds Apulia POR 2000-06, provision 6.2 action C
- De.Ma.S.S. (Design & Manufacturing Sharing System), funds Industry 2015, call "New Technologies for Made in Italy"
- E.R.M.E.S. (Enhance Risk Management through Extended Sensors), funds PON Research and Competitiveness 2007-13
- Ce.S.A.R. (Food certification and safety through RFID), funds RIDITT (Italian network for innovation diffusion and technology transfer to companies) Program 2007-09, national call for funding projects of diffusion and technology transfer to the productive system and setting up hi-tech companies
- G.A.I.A. (Generalized Automatic exchange of port Information Area), funds EU ETCP
- Lean Software Development, funds Apulia POR FESR 2007-13
- AskHealth (Advanced System for the interpretations and sharing of Knowledge in Health care), funds PON Research and Competitiveness 2007-13
- PLATINO (PLATform for INnOvative services in future Internet), funds PON Research and Competitiveness 2007-13
- RES NOVAE (Networks, buildings, roads - Novel improving aims for environment and energy), funds PON Research and Competitiveness 2007-13
- S.L.IM.Port (Safety, Logistics, InterModality for Ports), funds Industry 2015, call "Sustainable Mobility"
- LOG.IN. (Integrated logistics), funds Industry 2015, call "New Technologies for Made in Italy"
- KHIRA (Knowledge Holistic Integrated Research Approach), funds PON Research and Competitiveness 2007-13

- Puglia@Service (Internet-based service engineering to promote structural development of a "smart" territory), funds PON Research and Competitiveness 2007-13
- VINCENTE (A Virtual collective INtelligenCe ENvironment to develop sustainable Technology Entrepreneurship ecosystems), funds PON Research and Competitiveness 2007-13
- BE-Free@campus (Barriers and Exclusion-Free (built environment) at (university) campus), funds Italian Ministry of Education, University and Research
- EFFEDIL (EFFicient Energy buildING Innovative soLutions), funds PON Research and Competitiveness 2007-13
- Digital Apulia 2.0, funds PON Research and Competitiveness 2007-13
- A.R.G.E.S. (pAssengeRs and loGistics information Exchange System), funds EU ETCP
- InnovAALab (Telemedicine system for medical home care and fall risk detection via wearable electromiographs and electroencephalographs), funds Apulia POR FESR 2007-13, call "Living Labs Smart Apulia 2020"

7 Applications and prototypes

I have worked to both design and implementation of several prototypes and software applications starting from my research activity. Most relevant of them are reported in what follows along with a short description:

- **Mini-ME - the Mini Matchmaking Engine:** it is a prototypical mobile reasoner for the Semantic Web of Things. It supports standard Semantic Web technologies through the OWL API and implements both standard reasoning tasks for KB management (subsumption, classification, satisfiability) and non-standard inference services for semantic-based matchmaking and resource ranking (abduction, contraction and covering). Mini-ME has several versions: a Java-based for Android and another one in Java SE. More recently there is also a Swift version for iOS devices. URL: <http://sisinflab.poliba.it/swottools/minime>
- **iDriveSafe:** it is a mobile iPhone application for semantic-enhanced real-time car diagnostics and driving assistance. It allows to process: vehicle status data collected from an OBD-II Scan Tool; data acquired from embedded smartphone microdevices; optionally, information retrieved from external Web-based data sources. By means of proper data processing and fusion algorithms, the system is able to identify specific high-level events and conditions, based on low-level data streams. Exploiting Semantic Web techniques and technologies, events are annotated w.r.t. an ontology modeling factors influencing driving safety. The matchmaking outcome is used to suggest the driver actions and behaviors to minimize risks. URL: <http://sisinflab.poliba.it/swottools/idrivesafe1>
- **Mobile User Profiler:** it is a smart profiling agent able to perform an automated profile annotation by adopting Semantic Web languages. The crawler agent runs on the user smartphone and performs a multimodal and continuous detection without human intervention. The agent mines the user habits automatically and annotates them in a logic-based formalism to build a daily profile to be further exploited in context-aware knowledge-based applications. URL: <http://sisinflab.poliba.it/swottools/mobile-user-profiler>

- **Smart Building Automation:** it refers to a semantic-based framework and tool, able to interface users and devices within a service-oriented home appliance infrastructure in a fully automated fashion. All the applications and devices exploit a semantic-based evolution of EIB/KNX protocol. Machine-to-machine communication and negotiation as well as user interface of an Android application have been developed in a fully functional real home environment. URL: <http://sisinflab.poliba.it/swottools/smartbuildingautomation>
- **Semantic POI Annotation with JOSM:** it includes a prototypical software tool for editing semantic-based annotations of OpenStreetMap Points Of Interest (POIs), through a fully visual user interface based on simple drag-and-drop operations. The application extends the open source JOSM (Java OpenStreetMap) editor. It can make any OpenStreetMap contributor capable of enriching maps following the Semantic Web/Linked Open Data vision, because no specific knowledge of logic languages and underlying formalisms is required. URL: <http://sisinflab.poliba.it/swottools/josm>
- **BE-free@campus:** it is a personal navigation application assisting and supporting disabled people in a restrained environment. It is a tool for Android mobile devices. The embedded OsmAnd routing engine takes advantage of the crowd-sourced OpenStreetMap project, whose maps have been enriched with new tags providing accessibility data. The engine has been extended in order to provide multi-level indoor navigation. URL: <http://sisinflab.poliba.it/swottools/befree@campus>
- **Semantic blockchain Hyperledger Iroha:** it is a prototypical system as semantic-enhanced Service-Oriented Architecture for Internet of Things contexts. Nodes can exploit smart contracts for registration, discovery and selection of annotated services/resources. While semantic matchmaking enables relevant resource retrieval with logic-based ranking and explanation features, blockchain provides reliable transaction storage.

8 Collaboration with national and international research centres

During my research activity I have collaborated –among others– with the following national and international research centres:

- Knowledge Media Institute - The Open University (prof. E. Motta);
- University of Milan (prof. G.P. Rossi);
- ISTI-CNR (National Research Council) Pisa (dr. U. Straccia);
- DOCOMO Euro-Labs Munich (dr. M. Paolucci);
- Tuscia University (prof. F.M. Donini);
- University of Bologna Alma Mater Studiorum (prof. A. Omicini);
- University of London, Birkbeck College (dr. A. Cali);
- University of Bari A. Moro - Department of Computer Science (prof. G. Semeraro);
- University of Bari A. Moro - Department of Emergency and Organ Transplantation (prof. A.I. Guaricci);

- University of Bari A. Moro - Department of Physics (prof. R. Bellotti);
- Macquarie University, Department of Computing (prof. M. Sheng);
- University of California - Berkeley (prof. A. Sangiovanni Vincentelli);
- University of Roma Tre (prof. R. Torlone);
- University of Naples Federico II (prof. A. Pescapé);
- ITIA-CNR (National Research Council) Bari/Milano (dr. M. Sacco);
- Enel Distribuzione S.p.A. - R&D Department (dr. G. Bianco);
- Head of Italian Coastguard (Adm. P. Pellizzari);
- Telecom Italia S.p.A. - R&D Department (dr. E.M. Bagnasco);
- University of Ioannina (prof. C. Stylios);
- Google Inc. (dr. D. Ciulli);
- INFN (National Institute of Nuclear Physics) Bari (dr. S.S. Tangaro)
- Leonardo S.p.A. - Land & Battlefield Systems Division (dr. F. Cazzato)

9 Bibliometry

Bibliometric indexes retrieved May 10, 2019:

Scopus (<https://www.scopus.com/authid/detail.uri?authorId=13609738400>)

- Total citations: 726 by 471 documents
- Hirsch index (H-index): 16

Google Scholar (<https://scholar.google.it/citations?user=xxBeKlIAAAAJ&hl=it>)

- Total citations: 1176 (780 since 2014)
- Hirsch index (H-index): 21 (14 since 2014)
- i10 index: 34 (22 since 2014)

10 Roles and professional activity

10.1 Institutional roles

I have fulfilled the following institutional roles:

- Coordinator of the unit of Polytechnic University of Bari of the National CINI Lab Smart Cities and Communities
- Scientific Coordinator of Computer Science Lab of Polytechnic University of Bari in Taranto, named Semantic Web of Things (SWoT). At the lab are also affiliated a full professor, an assistant professor, two post-doc fellows, two senior research assistants, a Ph.D. student, two junior researchers and a technical assistant

- Technical and scientific committee of Apulian IT Cluster as representative for Polytechnic University of Bari
- Vice-coordinator of the Bachelor degree in Computer and Automation Engineering - D.M. 270/04 of Polytechnic University of Bari
- Representative for associate professors in the Council of Department of Electrical and Information Engineering of Polytechnic University of Bari
- Co-supervisor of the unit of Polytechnic University of Bari of the National CINI Lab Embedded Systems and Smart Manufacturing
- Delegate of Director of Department of Electrical and Information Engineering for information systems and dematerialization of processes and administration flows
- Rector's delegate for the computerization of university services
- Coordinator of the Master degree in Computer Engineering - D.M. 270/04 of Polytechnic University of Bari
- Representative of Department of Electrical and Information Engineering for disabled students
- Board of directors of the Regional Technological Cluster of Aerospace as representative for Polytechnic University of Bari
- Vice president of the Regional Mechatronic Cluster and Digital Innovation Hub Apulia

10.2 Professional jobs

Hereafter are reported main professional jobs:

- Reviewer of research projects for French National Research Agency in the Future Networks and Services (veRSO) Programme - ed. 2009
- Reviewer of research projects for the Italian Ministry of Education, University and Research in the PRIN (Projects of Relevant National Interest) Programme - ed. 2010/11 and 2012
- Tester for telematic services of the Port Community System (PCS) developed within the G.A.I.A. (Generalized Automatic exchange of port Information Area) project, at the Levante Port Authority
- Scientific supervisor of the annual research grant of 21.960,00 EUR by Eulogic s.r.l. for the activities of project DroMEP (Drones for Monitoring and Environmental Protection)
- Scientific supervisor of the research grant to the Computer Engineering research unit of Polytechnic University of Bari by the Commissioner of Italian Government for the urgent intervention of decontamination, ecologization and redevelopment of Taranto city
- Scientific supervisor of the research grant of 35.000,00 EUR by the cities of Barletta, Andria and Trani for activities supporting the executive planning within the project BATinnovation, in the initiative named "Patti per le Città"

- Scientific supervisor of the research grant of 35.380,00 EUR by the Abruzzo region (as managing authority of the IPA Adriatic Cross Border Cooperation Programme 2007-13) for devising the technical specification of further services of the prototypical information system NMSW-National Maritime Single Window named ARGES (under the umbrella of EASYCONNECTING project)
- Scientific co-supervisor of the research grant by the Regional Technological Cluster of Aerospace (Distretto Tecnologico Aerospaziale s.c.a.r.l.) for developing both software and control systems in the project aimed to develop and produce aeronautic engines for GE Avio s.r.l.
- Scientific supervisor of the research grant of 35.136,00 EUR by General Electric - Avio Aero Division s.r.l. for implementing a control system for a new family of turbojet engines by General Electric with specific reference to the development of avionic software for controlling and managing safety critical applications
- Scientific supervisor of the two-year research grant of 854.000,00 EUR by Fincons S.p.A. for the activities of the project named Smart Manufacturing Platform
- Responsible of the technical-scientific consultancy for the Italian Ministry of Infrastructures and Transportation - Headquarter of Italian Coastguard for studies, research and comparative analyses in the tender for acquiring services for design, development, enactment and management of the information system of National Maritime Single Window NMSW-PMIS
- Scientific supervisor of the two-year research grant of 109.800,00 EUR by LINKS Management and Technology S.p.A. for the activities of the project named "Nuovo Progetto"
- Scientific supervisor of the two-year research grant of 42.700,00 EUR by CLE (Computer Levante Engineering) s.r.l. for the activities of the project named SOPHIA (Operative Solutions for Healthcare through Artificial Intelligence)
- Scientific supervisor of the four-year research grant of 400.000,00 EUR by Telecom Italia S.p.A. for the activities of experimentation and support in the project of the Italian Ministry of Economic Development named "Bari-Matera 5G"
- Co-supervisor of the technical and scientific consultancy for Public Prosecutor office of Bari in the investigation of economic and financial collapse of Ferrovie del Sud Est e Servizi Automobilistici s.r.l.
- Reviewer for the call for proposals "Create a network around your research idea" by Polytechnic University of Turin
- Scientific supervisor of the two-year research grant of 64.840,00 EUR by ICAM s.r.l. for the activities of the project named I-GOIN
- Representative for Polytechnic University of Bari of research and study activities for Department of Information and Security (DIS) of the Italian Presidency of the Council of Ministers for actuating technical-scientific, educational and cultural initiatives devoted to improve cybersecurity in the Apulia region in favour of the overall national system
- Technical Advisory Board in the project INTER-PASS (Intermodal Passengers Connectivity between Ports and Airports), funded EU Interreg ADRIAN Programme

- Scientific supervisor of the two-year research grant of 650.000,00 EUR by Exprivia S.p.A. for the activities of the project named Digital Future
- Representative for Italian Ministry of Economic Development appointed by TIM-Fastweb-Huawei consortium for the social and economic evaluation of 5G technology in the applications of Bari-Matera experimental testbed

11 Other organizational activities

Nowadays I am also:

- Chairperson of Scientific Committee of I-3VLab (Italian Internet of Things Interoperability and Innovation Virtual Lab), Italian branch of the European network Interop-VLab focusing Internet of Things topics
- Componente del comitato paritetico di indirizzo delle attività di ricerca, sviluppo tecnologico e innovazione congiunte tra Politecnico di Bari e Consiglio Nazionale delle Ricerche
- Representative for Polytechnic University of Bari in the governing body of MARINE (Blue Growth Interdisciplinary Network for Apulia region)
- Member of the International Technical Working Group on IoT-Enabled Smart City Framework (initiative by ENEA, NIST (National Institute of Standards and Technology - U.S. Department of Commerce), ANSI (American National Standards Institute), ETSI (European Telecommunications Standards Institute), TIA (Telecommunications Industry Association), Fiware, MSIP (Ministry of Science, ICT and Future Planning - South Korea) and USGBC (U.S. Green Building Council)
- Member of the International Working Group on "Swarm-centric Systems" of NATO
- Member of the Teaching Observatory of Department of Electrical and Information Engineering of Polytechnic University of Bari (Professors-students' peer committee according to the provision of law 240/2010 under the art. 2 co. 2)
- Member of the scientific board of inter-university research center named "Industry 4.0", Apulian branch of the MedITech Competence Center within the national and international initiatives for Industry 4.0
- Co-supervisor of multidisciplinary research group Polytechnic University of Bari-Cancer Foundation Bari Giovanni Paolo II - IRCCS, for research and consultancy activities on topics of mutual interest
- Scientific co-supervisor of Digital Experience Laboratory (LED) established at Polytechnic University of Bari in cooperation with Microsoft Inc.
- Supervisor of the Echelon's Education Program for Polytechnic University of Bari
- Supervisor of the Oracle Academy Program for Polytechnic University of Bari
- Supervisor of the IBM Academic Initiative Program for Polytechnic University of Bari
- Member of the National Olympic Committee of the Italian Olympics on Computer Science (OII)
- Instructor at the Amazon Web Services Academy - curriculum "Cloud Computing Architecture" by Amazon.com Inc.

12 Technology transfer

I have obtained the following results of technology transfer from my research activity in terms of new enterprise creation (spin-off), consultancy agreements, development, exploitation and commercialization of patents and tools:

- I have been among founders of the **D.O.O.M. s.r.l.** (Data Over Ontological Models), an academic spin-off co-funded by the Basilicata region after the good ranking of the call Basilicata POR 2000-2006 Line III - Provision III.1.D.4. D.O.O.M. aimed to implement and sale results of research carried out in the Semantic Web field, and particularly of mobile and ubiquitous computing technologies
- I have participated to the spin-off **S.T.A.R.** (Semantic Technologies and Applied Research) of Polytechnic University of Bari for which I'm in charge within the Board of Directors as representative of Polytechnic University of Bari
- I'm co-founder and CEO of the academic spin-off **donkeyPower s.r.l.s.**, aimed at technology transfer, engineering and selling of research results in the field of Semantic Web of Things devoted to apply Artificial Intelligence techniques and technologies to the Internet of Things

13 Teaching

13.1 University courses

My teaching activity has started in the academic year 2003/04 and since then I have carried out university courses. At Polytechnic University of Bari:

- Operating Systems (6 ETCS) for Master degree of Telecommunication Engineering (A.Y. 2007-2008, 2008-2009, 2009-2010)
- Computer Science for Automation I (6 ETCS) for Master degree of Automation Engineering (A.Y. 2007-2008, 2008-2009, 2009-2010, 2010-2011)
- Telematics II (3 ETCS) for Master degree of Computer Engineering (A.Y. 2006-2007, 2007-2008, 2008-2009, 2010-2011)
- Telematics II (3 ETCS) for Master degree of Telecommunication Engineering (A.Y. 2006-2007, 2007-2008, 2008-2009, 2009-2010, 2010-2011)
- Basics of Computer Science (6 ETCS) for Master degree of Industrial Engineering (A.Y. 2009-2010)
- Computer Science for Automation - 2nd module: Operating Systems for Advanced Applications (6 ETCS) for Master degree of Automation Engineering (A.Y. 2010-2011)
- Operating Systems - 1st module (6 ETCS) for Bachelor degree of Electronic and Telecommunication Engineering - D.M. 270/04 (A.Y. 2011-2012)
- Operating Systems - 2nd module (6 ETCS) for Bachelor degree of Electronic and Telecommunication Engineering - D.M. 270/04 (A.Y. 2011-2012, 2012-2013)
- Computers and Telecommunication Networks - 2nd module: Application protocols (3 ETCS) for Bachelor degree of Computer and Automation Engineering - D.M. 270/04 (A.Y. 2011-2012)

- Computer Science for Automation - 1st module: Introduction to Operating Systems (6 ETCS) for Master degree of Automation Engineering - D.M. 270/04 (A.Y. 2011-2012, 2012-2013)
- Computer Science for Automation - 2nd module: Operating Systems for Advanced Applications (6 ETCS) for Master degree of Automation Engineering - D.M. 270/04 (A.Y. 2011-2012, 2012-2013)
- Basics of Operating Systems (6 ETCS) for Master degree of Automation Engineering - D.M. 270/04 (A.Y. 2013-2014, 2014-2015, 2015-2016, 2016-2017, 2017-2018)
- Operating Systems for Advanced Applications (6 ETCS) for Master degree of Automation Engineering - D.M. 270/04 (A.Y. 2013-2014, 2014-2015, 2015-2016, 2016-2017, 2017-2018)
- Basics of Operating Systems (6 ETCS) for Bachelor degree of Computer and Automation Engineering - D.M. 270/04 (A.Y. 2013-2014, 2014-2015, 2015-2016, 2016-2017, 2017-2018, 2018-2019)
- Operating Systems for Advanced Applications (6 ETCS) for Bachelor degree of Computer and Automation Engineering - D.M. 270/04 (A.Y. 2013-2014, 2014-2015, 2015-2016, 2016-2017, 2017-2018, 2018-2019)
- Web Languages and Technologies – Module Web oriented technologies and systems (6 ETCS) for Master degree of Computer Engineering - D.M. 270/04 (A.Y. 2016-2017, 2017-2018, 2018-2019)
- Programming Avionic Systems (6 ETCS) for Bachelor degree of Avionic Systems Engineering - D.M. 270/04 (A.Y. 2016-2017, 2017-2018, 2018-2019)

At University of Salento (Lecce):

- Embedded and Certified Software (6 ETCS) for Master degree of Aerospace Engineering - D.M. 270/04 (A.Y. 2017-2018, 2018-2019)

13.2 Masters and higher education courses

- *Basic technological elements and computer science for the digital broadcasting within the project Terrestrial digital platform for television services with high social impact* (PIT n.3) for Consortium for Services in TELEvision (CO.S.TE.)
- *Training to use Linux Operating System* in the National Operative Programme "Innovation PIA project - Local enterprises development" - Provision 2.1
- *Real time and embedded systems* in the Master of *Technological Advances in Mecathronics* organized by Polytechnic University of Bari (June 2007)
- *3D and immersive technologies* in the higher education course of *Network Software Specialist* held at Istituto di Istruzione Secondaria Superiore Amerigo Vespucci, Molfetta (February 2013)
- *Geo-referenced smartphone devices* in the higher education course of *Network Software Specialist* held at Istituto di Istruzione Secondaria Superiore Amerigo Vespucci, Molfetta (February 2013)
- *DBMS languages: SQL* in the higher education course of *Software Development Specialist* held at Centro Studi Levante, Molfetta (May 2013)

- *Databases and Information Systems design* in the higher education course of *Software Development Specialist* held at Centro Studi Levante, Molfetta (May 2013)
- *Analysis and Design Methods for Web-based Applications* in the higher education course of *Software Development Specialist* held at Centro Studi Levante, Molfetta (May 2013)
- *Operating Systems and Computer Networks* in the higher education course of *Web environments System Specialist* held at Centro di formazione professionale Programma Sviluppo, Bari (January 2014)
- *Development of a Web application* in the higher education course of *Software Development Specialist* held at Centro di Formazione ed Orientamento Professionale Don Tonino Bello, Andria (March 2014)
- *Java Programming* in the higher education course of *Software Development Specialist* held at Centro di Formazione ed Orientamento Professionale Don Tonino Bello, Andria (March 2014)
- *Analysis and Design Methods for Web-based Applications* in the higher education course of *Application software designer* held at Centro Studi Levante, Molfetta (May 2014)

13.3 Support to university courses

- Basics of Computer Science I for Master degree of Telecommunications Engineering (A.Y. 2003-2004)
- Basics of Computer Science I for Master degree of Computer Engineering (A.Y. 2004-2005)
- Operating Systems (O.O.) for Master degree of Computer Engineering (A.Y. 2004-2005)
- Operating Systems (N.O.) for Master degree of Computer Engineering (A.Y. 2004-2005, 2005-2006, 2006-2007, 2007-2008, 2008-2009, 2009-2010)
- Operating Systems (N.O.) for Master degree of Telecommunications Engineering (A.Y. 2004-2005, 2005-2006, 2006-2007)
- Computer Science for Automation I (N.O.) for Master degree of Automation Engineering (A.Y. 2004-2005, 2005-2006, 2006-2007)

I have also carried out supplementary teaching activity for the Information Systems course (Master degree of Computer Engineering, Electronics Engineering and Industrial Engineering) and for the Web Information Systems course at Computer Engineering Master degree.

I have been advisor or co-advisor of several Bachelor degree or Master degree thesis in disciplines I have taught or supported.

13.4 Ph.D.

I have carried out the following activities for Ph.D. courses:

Ph.D. advisory for the topics:

- XXV course: Knowledge representation methods for smart devices in intelligent buildings
- XXVII course: Machine learning methods for ubiquitous computing
- XXIX course: Object (b)logging: a semantic-based self-description for things networks in pervasive contexts
- XXIX course: A semantic-based bio-signal mining for sentiment analysis
- XXXII course: Object (b)logging: a semantic-based self-description in Cyber Physical Systems

Participation to the Academic Board of Ph.D in Electrical and Information Engineering of Polytechnic University of Bari and formerly of Ph.D. in Information Engineering

Participation to the Selection Board of Ph.D. in Electrical and Information Engineering of Polytechnic University of Bari

Participation to the Final Evaluation Board of several Ph.D courses in both Italian and foreign universities

Post-doc advisory for research projects assigning post-doctoral fellowships

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I hereby certify, under my responsibility and according to the provision of law about substitute declarations under the articles 46 and 47 of D.P.R. 445/2000, that what stated in this document is true.

Bari, May 15, 2019

Michele Ruta