ACADEMIC PORTFOLIO

Enrico Natalizio

1. BASIC INFORMATION

First Name: Enrico
Last Name: Natalizio
Birth-date: October 6th, 1976
Birthplace: Cosenza, Italy
Foreign Languages: English: fluent, written and spoken (C1 European Standard). French: fluent, written and spoken (C1 European Standard). Spanish: good spoken and written (B2 European Standard). Italian: mother tongue.

Current Employer: University of Lorraine
Position Title: Full Professor
Start date: September 1st, 2018

Previous Employer: Université de Technologie de Compiègne
Position Title: Associate Professor
Start date: September 1st, 2012 – August 31st, 2018

Previous Employer: Inria Lille – Nord Europe, France
Position Title: Postdoctoral research fellowship
Start date: From October 2010 to August 2012

Previous Employer: Università della Calabria, Italy
Position Title: Contract professor and post-doc researcher
Start date: From January 2006 to September 2010

Previous Employer: Value Partners
Position Title: Junior Consultant
Start date: From June to December 2002

HDR: obtained from Université de technologie de Compiègne in November 2017.

PhD in Computer Science Engineering: obtained from University of Calabria (Italy) in March 2006.

Master's Degree in Computer Science Engineering (Magna cum laude): obtained from University of Calabria (Italy), in May 2001. Equivalent to M.Sc.

2. QUALIFICATION IN RESEARCH AND DOCTORAL TRAINING

Honours and awards by scientific societies
- Granted the *Prime d'Excellence Scientifique* from the French Ministry of Education and Research in October 2013 for the quality of his research.
- Former Member of CNIT (Italian National Consortium for Telecommunications) Research Unit at the University of Calabria.
- Granted 10.000 USD from IEEE Foundation (Institute of Electrical and Electronics Engineers) in 2004 for the proposal and the organization of the 1st IEEE-EESTEC Technical Conference on "Engineering Education" for IEEE Student branch and EESTEC (Electrical Engineering STudents' assoCiation) Local Committee members.
- Winner of the CNIT (Italian National Consortium for Telecommunications) yearly grant for graduate students in 2001.
- IEEE associate member

Nature of research and activities report for the last 5 years
As a researcher, from the very beginning Enrico Natalizio's activity has been characterized by the study of the impact of mobility in telecommunication systems. In fact, in his master's thesis he proposed a new resource allocation scheme for mobile users of cellular systems that was published in an IEEE Transaction on Vehicular Technology. In his Ph.D.

thesis Enrico focused on mobility management schemes in different networks: IP, cellular, satellite and heterogeneous networks by publishing several papers in international conferences. During his period as a visiting researcher at the BWN Laboratory at Georgia Tech (USA), under the supervision of Prof. Akyildiz, he started thinking of devices' controlled mobility as a self-organizing network control primitive and pushing this concept in the telecommunications community. In 2009 Enrico Natalizio began collaborating with Prof. Marco Dorigo from the Universitè Libre de Bruxelles on the application of swarm intelligence theory and algorithms to self-organizing networks. This collaboration produced the proposal of a Marie Curie project in 2010 on self-organizing devices provided with cognitive capabilities, and the accepted proposal of a project in the national Italian framework of the 2009 PRIN program. Besides mobility in classical and self-organizing networks, Enrico Natalizio's research has focused on transport protocol for mesh networks (the effort produced a journal paper, a book chapter and a conference paper).

Since his arrival at the Heudiasyc Lab in September 2012 of the Université de Technologie de Compiègne, while continuing working on his old research activities, he has been focusing on two main topics: Mobile Sensor, Robot and UAV networks, and Security for the Internet of Things.

Concerning the first topic, which is an evolution of his previous activities, he has been working with several colleagues from different disciplines, specifically Artificial Intelligence, Vision and Control Theory, in order to create an integrate framework for the design and implementation of communication methods and protocol for groups of robots (terrestrial and UAV) performing specific missions. Since 2012, on this topic, he has been supervising 2 Ph.D. students and his efforts have been rewarded with:
- a grant from the Region Picardie for the integration of sensors and UAVs into a System of Systems for natural disaster management;
- 10 journal papers;
- 17 International conference papers.

Concerning the second topic, which was a completely new research activity, he has been working on the definition of schemes for preserving privacy and create trust among communicating objects within some complex environments, such as smart office, smart factory and smart homes, composed of several heterogeneous devices. On this topic he is currently supervising a Ph.D. student and his effort produced:
- 3 International conference papers and 3 journal submissions.

Scope of publications

⚐ Mobile Sensor, Robot and UAV Networks;

⚐ Swarm Communications;

⚐ Multimedia Wireless Networks;

⚐ Integration of heterogeneous networking systems;

⚐ Security in the Internet of Things.

International activities

– *International mobility:*

⚐ From October 2010 till August 2012, Enrico Natalizio has worked in the FUN (former POPS) Team at INRIA Lille – Nord Europe, France, as a postdoctoral researcher. In the FUN Team he has worked on Mobile Sensor and Robot Networks in the framework of the projects MISSION and RESCUE. In the two years of postdoc at INRIA Lille, Enrico has produced 2 journal papers and 5 conference papers on the main topic of his research.

⚐ From January 2005 to July 2005 and from October 2005 to April 2006, Enrico Natalizio visited the BWN Lab at Georgia Tech (USA) where, under the supervision of Prof. Ian Akyildiz, he worked on transport protocols for mesh networks and mobility in sensor and actor networks. Regarding the first topic, Enrico Natalizio along with Dr. Vehbi Cagri Gungor and Dr. Pasquale Pace proposed a transport protocol for wireless mesh networks and implemented it in NS2 (Network Simulator 2). Simulation studies showed the remarkable performance of the protocol, which was first presented in "AR-TP: An Adaptive and Responsive Transport Protocol for Wireless Mesh Networks" accepted at IEEE ICC 2007 and then more extensively in "A reactive and dependable transport protocol for wireless mesh networks" published in Elsevier Journal of Parallel and Distributed Computing in January 2010. To date, only one other protocol has been proposed to solve the same issue. The knowledge acquired by studying wireless mesh networks gained an invitation to participate again with Dr. Gungor in the preparation of a chapter on "Challenges and Issues in Designing Architectures and Protocols for Wireless Mesh Networks", published in Wireless Mesh Networks: Architectures, Protocols, and Applications, E. Hossain and K. K. Leung (editors), Springer 2007. Regarding the second topic, it is still Enrico's most important research directions.

- ⚜ From November 2003 to March 2004, Enrico Natalizio visited the Wireless Communication Lab (IEIIT-CNR at Bologna University - Italy), where, under the supervision of Prof. Oreste Andrisano, he developed a simulator of a cellular hotspot in an urban centre that he successively used for several of his earliest works.

– *Professional services:*
  - ⚜ Editorship:
    - Associate Editor of Elsevier Ad Hoc Networks;
    - Associate Editor of Elsevier Digital and Communication Networks;
    - Associate Editor of Wiley&Hindawi Wireless Communications and Mobile Computing;
    - Associate Editor of Ad Hoc & Sensor Wireless Networks (until December 2015);
    - Guest Editor of the Special Issue of the Elsevier Ad Hoc Networks on "Advances in Wireless Communication and Networking for Cooperating Autonomous Systems" (Submission Deadline, April 14th, 2017);
    - Guest Editor of the Special Issue of the Elsevier Digital Communication and Networks on "Theory and Applications of UAV Networks" (Submission Deadline, October 15th, 2016);
    - Guest Editor of the Special Issue of the Asian Journal of Control on "Advances in Control and Optimization over Wireless Sensor and Actuator Networks" (Submission Deadline, January 31st, 2016);
    - Guest Editor of the Special Issue of the Hindawi Mobile Information Systems Journal on "Crowdsensing and vehicle based sensing" (Submission Deadline, May 20th, 2016)
    - Guest Editor of the Special Issue of Elsevier Computer Communications on "Mobile Ubiquitous Sensing: from Social Network Viewpoint" (Submission Deadline, March 31st, 2014);
    - Guest Editor of the Special Issue of Elsevier Ad Hoc Networks on "Internet of Things security and privacy: design methods, detection, prevention and countermeasures" (Submission Deadline, May 15th, 2014);
    - Guest Editor of the Special Issue of Springer MONET on "Wireless Technology for Pervasive" Healthcare (Submission Deadline, September 15th, 2012).
    - Guest Editor of the Special Issue of Elsevier Ad Hoc Networks on "Theory, Algorithms and Applications of Wireless Networked Robotics" (Submission Deadline, October 31st, 2011).

  - ⚜ Organizing committee membership:
    - Track Chair for the Hot Topics in Networking (HOT) Track of the 28th International Conference on Computer Communications and Networks (ICCCN 2019);
    - Track Chair for the IoT and smart X: Networking, Cloudification and Services Track of the 11th edition of Wireless Days (WD'19);
    - TPC Chair for the Second International Balkan Conference on Communications and Networking (Balkancom);
    - Publicity Chair for the First International Balkan Conference on Communications and Networking (Balkancom);
    - Publicity Chair for the Sixth International Conference on Selected Topics in Mobile & Wireless Networking (MoWNet'17);
    - Track Chair for the Smart Spaces and IoT Networking Track of the 12th IEEE Consumer Communications and Networking Conference (IEEE CCNC) 2016, 2015;
    - TPC Chair of the International Workshop on Wireless Sensor, Actuator and Robot Networks (WiSARN) 2018, 2017, 2016, 2014;
    - Track Chair for the Vehicular Communications and Applications in Water, Land, and Sky Track of the 13th IEEE Consumer Communications and Networking Conference (IEEE CCNC) 2016;
    - Track Chair for the Cellular Networks Track of the 80th IEEE Vehicular Technology Conference (IEEE VTC Fall 2015);
    - Track Co-Chair for the IoT Services and Applications Track of the IEEE TENSYMP Symposium (IEEE TENSYMP) 2015;
    - Workshop Chair of the 6th International Conference on Ad Hoc Networks (AdHocNets) 2014;
    - Organizer and Chairman of the International workshop on Internet of Things – Ideas and Perspectives (IoTIP) at the IEEE International Conference on Distributed Computing in Sensor Systems (IEEE DCOSS) 2015, 2014, 2013;
    - Organizer and Chairman of the Special Track Unconventional Intrabody Communications (UnIC) at the 9th International Conference on Body Area Networks (BodyNets) 2014;
    - Publicity Chair of the 9th International Conference on Body Area Networks (BodyNets) 2014;
    - Proceedings & Journals publication Chair of the International Conference on Advanced Networking, Distributed Systems and Applications (INDS) 2014;
    - Organizer and Chairman of the 2nd Int'l Workshop: Mobility and Communication for Coordination and Cooperation workshop at the International Conference on Advanced Robotics (ICAR) 2013;

- Track Chair of Distributed Systems, Protocols, Optimization and Applications at the 8th International Conference on P2P, Parallel, Grid, Cloud and Internet Computing (3PGCIC) 2013;
- Organizer and Chairman of the MC^3: Mobility and Communication for Coordination and Cooperation workshop at the International Conference on Computing, Networking and Communications (ICNC) 2012;
- Publicity Chair of the 2012 IEEE International Conference on Internet of Things (iThings 2012);
- Publicity Co-Chair of the 5th International Workshop on Wireless Sensor, Actuator and Robot Networks (WiSARN 2012-Spring), 2012;
- Publicity Chair of The 7th International Conference on Bio-Inspired Models of Network, Information, and Computing Systems (BIONETICS 2012), 2012;

⪼ Technical program committee membership:
- The IEEE Wireless Communications and Networking Conference (WCNC), 2019, 2015 (Track 3 and 4), 2014 (Track 3 and 4), 2012 (Track 3);
- IEEE Global Communication Conference (GLOBECOM) 2019, 2018, 2017, 2016, 2015, 2014, 2013;
- The IEEE International Conference on Computer Communications (INFOCOM 2018) 2018;
- The Seventh International Conference on Selected Topics in Mobile & Wireless Networking (MoWNet'18);
- The Annual Conference on Wireless On-demand Network Systems and Services (WONS) 2018, 2017, 2014, 2013;
- IEEE 5G Forum 2018;
- International Conference on Ad-Hoc Networks and Wireless (AdHocNow) 2018, 2017, 2016, 2015, 2014;
- SPIoT 2017;
- The IFIP Networking Conference (NETWORKING 2017) 2018, 2017;
- The International Conference on Mobile Systems and Pervasive Computing (MobiSPC) 2017, 2015;
- The IEEE International Conference on Communications (ICC) 2019, 2018 2017, 2016, 2015, 2014;
- DroNet 2018, 2017, 2016, 2015;
- 19th IEEE International Conference on Computational Science and Engineering (CSE 2016);
- International Conference on Computing, Networking and Communications (ICNC), 2017, 2016, 2015, 2014, 2013, 2012;
- ACS/IEEE International Conference on Computer Systems and Applications (AICCSA) 2016, 2015;
- IEEE Personal, Indoor and Mobile Radio Communications (PIMRC) 2018, 2017, 2016, 2015, 2013;
- The IEEE International Conference on Autonomous Robot Systems and Competitions (ICARSC) 2018, 2016, 2015;
- The International Conference on Internet and Distributed Computing Systems (IDCS) 2016, 2015, 2014;
- Future Internet and Internet of Things Applications (FIoTA) 2016;
- The IEEE International Conference on Wireless and Mobile Computing, Networking and Communications (WiMob) 2017, 2016, 2015, 2014, 2013;
- 2nd International Workshop on Mobility, Interference and MiddleWare Management in HetNets (MobiMWareHN) 2016;
- The First IEEE International Smart Cities Conference (ISC2), 2015;
- SMARTOBJECTS 2016, 2015: workshop at ACM Mobicom;
- IEEE INFOCOM 2015 Poster Review Committee;
- 1st International Workshop on Visible Light Communications and Networking at the IEEE International Conference on Communications (ICC) 2015;
- Self-Organizing Wireless Access Networks for Smart City (SWANSITY), workshop at the IEEE SECON 2015, 2014;
- The International Conference on Ad-Hoc Networks and Wireless (AdHocNets) 2015, 2014, 2013, 2012;
- Wireless Sensor Networks: Architectures, Deployments and Trends (WSN-ADT) workshop at the International Conference on New Technologies, Mobility and Security (NTMS) 2016, 2015, 2014, 2012;
- European Conference on the Applications of Evolutionary Computation (EvoCOMNET) 2015, 2014, 2013, 2012;
- The 12th International Symposium on Programming and Systems (ISPS) 2015;
- The 9th International Conference on Body Area Networks (BodyNets) 2014;
- The International Conference on Connected Vehicles & Expo (ICCVE) 2014, 2013;
- The Global Information Infrastructure and Networking Symposium (GIIS) 2014, 2013;
- The International Workshop on Wireless Sensors Networks for Mobile Health (WSN4Health), workshop at the Fourth International Conference on Selected Topics in Mobile & Wireless Networking (MoWNet), 2014;

- The 5th IEEE Workshop on Optical Wireless Communications (OWC), 2014, workshop at the IEEE Global Communication Conference 2014;
- The 16th IEEE International Conference on High Performance and Communications (HPCC), 2014;
- The 7th International Conference on Internet and Distributed Computing Systems (IDCS 2014);
- Rencontres Francophones sur les Aspects Algorithmiques des Télécommunications (Algotel) 2014;
- IARIA Sensorcomm 2014, 2013, 2012, 2011 and 2010;
- The 9th IEEE International Wireless Communications and Mobile Computing Conference (IWCMC) 2013;
- The 10th Annual Conference on Wireless On-Demand Network Systems and Services (WONS) 2013;
- The 22nd Wireless and Optical Communication Conference (WOCC) 2013;
- The International workshop on Cooperative Robots and Sensor Networks (RoboSense) 2013;
- International Workshop on Wireless Sensor, Actuator and Robot Networks (WiSARN 2013-Spring, WiSARN 2012-Fall, WiSARN 2012-Spring), 2013, 2012;
- IEEE Symposium on Wireless Telecommunications Applications (ISWTA) 2012;
- Wireless Sensor Networks for Intelligent Transportation Systems (WSN4ITS-2012), workshop at the IEEE iThings, IEEE/ACM GreenCom, IEEE CPSCOm 2012;
- International Workshop on Internet of Things Enabling Technologies: Embracing Machine-to-Machine (M2M) Communications and Beyond, at the IEEE Wireless Communications and Networking Conference (WCNC) 2012.

⚔ Journal reviewer:
- Elsevier Information Fusion 2015;
- IEEE Transactions on Control Systems Technology 2015;
- IEEE Transactions on Mobile Computing 2015;
- Elsevier Ad Hoc Networks 2015, 2014, 2013, 2012;
- IEEE Internet of Things Journal 2014;
- IEEE Transactions on Computers 2014;
- IEEE Transactions on Wireless Communications 2013;
- Elsevier International Journal of Robust and Nonlinear Control 2013;
- Elsevier International Journal of Electronics and Communications 2013;
- Taylor & Francis Optimization Methods and Software 2013;
- Wiley International Journal of Communication Systems 2013;
- Elsevier Computer Communications 2013, 2011;
- IEEE Transactions on Parallel and Distributed Systems 2013;
- IEEE Transactions on Evolutionary Computation 2013, 2010;
- Elsevier Robotics and Autonomous Systems 2012;
- IEEE Sensors 2012;
- International Journal of Communication Systems 2012;
- Wiley International Journal of Communication Systems 2012;
- Elsevier Computer Networks 2012;
- ACM/Kluwer Wireless Networks 2011;
- Springer Telecommunications System 2011;
- Computer Journal 2011;
- International Journal of Parallel, Emergent and Distributed Systems 2011;
- IEEE Wireless Communication Magazine 2010;
- Elsevier Ad-Hoc Networks 2010;
- Discrete Mathematics & Theoretical Computer Science 2010;
- IEEE Communication Letters 2009;
- Elsevier Journal of Parallel and Distributed Computing 2009;
- Wiley Wireless Communications and Mobile Computing 2009;
- European Transactions on Telecommunications 2009;
- ACM/Springer Mobile Networks and Applications 2008;
- Journal of Digital Information Management 2007;
- Journal of Communications and Networks 2006;
- IEEE Transactions on Vehicular Technologies 2003.

⚔ Conference reviewer:
- The 14th Annual International Conference on Modeling, Analysis and Simulation of Wireless and Mobile Systems (ACM MSWIM) 2012;
- The 8th IEEE International Conference on Distributed Computing in Sensor Systems (IEEE DCOSS) 2012;

- The 8th IEEE International Conference on Mobile Ad-hoc and Sensor Systems (IEEE MASS) 2011;
- The 6th IEEE International Conference on Intelligent Data Acquisition and Advanced Computing Systems: Technology and Applications (IDAACS) 2011;
- The 29th Annual IEEE International Conference on Computer Communications (IEEE INFOCOM) 2010;
- The 2nd International Conference on network-based Distributed Computing and Knowledge Discovery (Cyber-C) 2010;
- The 4th Annual IEEE Communications Society Conference on Sensor, Mesh and Ad Hoc Communications and Networks (SECON) 2007;
- The 42nd IEEE International Conference on Communications (ICC) 2007;
- The 20th IEEE International Symposium on Personal, Indoor and Mobile Radio Communications (PIMRC) 2009;
- The IEEE Global Communications Conference (GLOBECOM) 2005.

Scope and management of external research funding and projects
- Projects proposed as the main coordinator:

2015
✦ *IMATISSE: Inundation Monitoring and Alarm Technology In a System of SystEms*
Funded by Region Picardie, France, €391.000.
Short abstract: The idea underlying this proposal is to create a System of Systems that combines the capabilities of sensor and robot networks with the participation of humans through a new sensing paradigm called mobile crowdsensing in order to constantly monitor rivers and brooks, to give the alarm and describe potential situations of danger, and foster prompt intervention by providing real-time communications to rescuers.

2013
✦ *Robot and Sensor Networks.*
Funded by Italian Ministry for Territorial Coesion, 34.800€
Short abstract: This project had the aim of preparing and teaching a course for Master and Ph.D. students who are starting doing research. The content of the course consisted in the design, the functioning and the integration in a larger network of smart devices equipped with controlled mobility and other controlled features.
Management: The proposal was prepared with the Chairman of the telecommunications degree course of Università della Calabria (Italy) and the theoretical and practical lessons were given at the students of the same University in June 2013.

2011
✦ *STEMWARE - Sharing&Teamworking Enabled by MiddleWARE.*
Submitted to ICT FET Open Call, FP7-ICT-2011-C Young Explorer – rejected.
Short abstract: STEMWARE provides a self-organizing control framework for a group of heterogeneous devices with different capabilities in order to address generic mission-oriented applications. The proposal covers the future pervasive and distributed sensor-actuator systems and requires knowledge of robotics, networking, optimization and AI. The main objective is the design and implementation of a novel middleware that transparently supports synergistic interoperability and federation among the devices.
Partners: INRIA Lille – Nord Europe, France; University of Klagenfurt, Austria; IDSIA Lugano, Switzerland; University of Calabria, Italy; Democritus University of Thrace, Greece.
Management: Mainly through skype conference calls. Proposal prepared in the period May-September 2011.

2010
✦ *STEM-NET: "STEM" devices for self-organizing wireless Networks.*
Funded by Italian Ministry of Education and Research in July 2011 under the framework of National research project (PRIN), 203.801 €
Short abstract: The project STEM-NET proposes the introduction of the concept of "stem" unit among the wireless network devices. As its biological counterpart, a network stem unit will be able to self-(re)configure depending on the service requirements and on the context where it is working, and to self-organize through the interactions with other units.
Partners: University of Calabria, University of Bologna, University "Mediterranea" of Reggio Calabria.
Management: Mainly through skype conference calls. The official proposer of the project was Prof. Emanuele Viterbo, since non-permanent researchers are not allowed to propose "PRIN" projects. The proposal was prepared over the period of December 2009-April 2010.

⚔ *SWARMY: Social Wireless Architecture for Robotized Mobile technologY*
European project in the framework of the Marie Curie for international outgoing fellowship (FP7-IEF). The project passed the evaluation round but was not included in the financed projects.
<u>Short abstract:</u> The focus of the SWARMY project is the design and implementation of an architecture of devices, equipped with basic hardware capabilities of sensing, processing, movement, communication, and able to self-organize and adapt to the changes in the surrounding environment in a distributed, autonomous manner. The two main novelties of SWARMY are: the "sociality" of the devices and their capability to evolve by learning from direct exposure to other devices.
<u>Partners:</u> Prof. Marco Dorigo – Universite Libre de Bruxelles.

2009
⚔ *MOSTLyWARE: Methodology, tools and technology to enable heterogeneous self-organizing wireless networks*
National projects in the framework of the Italian Basic Research Funds (FIRB) program for researcher under 32 years. The project scored 38 out of 40, but it was not included in the financed projects, since only 1.5% of the projects were funded.
<u>Short abstract:</u> The project aims at investigating the research scenarios opened by the self-organization of network segments and determining technology and tools to enable the self-organization. By considering a node as a "Stem Unit", MOSTLyWARE wants to give the idea of a device with very little hardware, where mostly everything is implemented in the software.
<u>Partners:</u> University of Calabria, University of Bologna, University "Mediterranea" di Reggio Calabria.

– Projects participated as a member:

2010
⚔ *RESCUE: RESeau Coordonné de sUbstitution mobilE*
ANR Project started in 2010.
<u>Short abstract:</u> When usual or backup networks are not available, due to any human or natural event, it would be interesting to deploy, for a limited time corresponding to the period of the problem (i.e., failure or traffic overload), a substitution network to help the base network keep providing services to users. The RESCUE project investigates both the underlying mechanisms and the deployment of a substitution network composed of a fleet of dirigible wireless mobile routers. Unlike many projects and other scientific works that consider mobility as a drawback, RESCUE uses controlled mobility of the substitution network to help the base network to reduce contention or to create an alternative network in case of failure.
<u>Partners:</u> UPMC/Paris 6, INRIA Lille – Nord Europe, INRIA Grenoble, LAAS, Orange Labs.
⚔ *MISSION: MobIle SubStItution Networks*
INRIA ARC Project started in October 2010.
<u>Short abstract:</u> The project MISSION proposes to study and implement the deployment of a substitution network composed of mobile routers, able to reach the positions needed to replace broken links. MISSION focuses on the depolyment and re-deployment for routers depending on the connectivity, but also on the bandwidth and delay requirements.
<u>Partners:</u> INRIA Lille – Nord Europe, INRIA Grenoble – Rhone Alpes, UPMC / Paris 6.

2006-2008
⚔ *NADIR: Design and assessment of protocols and distributed algorithms for Quality of Service mesh networks*
funded by Italian Ministry of Education and Research under the framework of National research project (PRIN).
<u>Short abstract:</u> The project was aimed at promoting research in the field of Wireless Mesh Networks (WMN), based on either standard or emerging technologies. Such infrastructures have been recently devised to allow mobile users an ubiquitous, QoS-based access to networks, such as the Internet, or metropolitan networks, or corporate networks of private and public companies.
<u>Partners:</u> University of Pisa, University of Napoli Federico II, University of Bologna, University of Calabria.

2002 – 2004
⚔ *Integration of Satellite Systems and High Altitude Platforms in Heterogeneous Communications Networks*
funded by Italian Ministry of Education and Research under the framework of National research project (PRIN).
<u>Short abstract:</u> Integration of Satellite/HAPs platforms for future generation communications systems, peculiarly for (1) adaptive quality of service management for multimedia applications, (2) analysis of traffic models for packet switching systems, (3) analysis of propagation models and channel estimation.

2000 – 2002
⚔ *Code Division Multiple Access for Broadband Mobile Terrestrial-Satellite Integrated Systems (CABIS)*
funded by Italian Ministry of Education and Research under the framework of National research project (PRIN). <u>Short abstract:</u> Analysis of techniques for supporting broadband multimedia services in terrestrial/satellite integrated radiomobile systems through the usage of CDMA technique.

National and international research collaboration

The candidate started developing his network of professional collaborations even before obtaining his Master's degree by being a member and the 1999-2000 European Vice-Chairman of EESTEC (Electrical Engineering STudents' assoCiation) and founder and Chairman of the IEEE Student Branch Cosenza. As witnessed by the international mobility in section 2, the project list and the publication list, the candidate has constantly enlarged his collaboration network which now includes 10 research groups around the world (IDSIA, Switzerland; Università di Bologna, Università "Mediterranea" di Reggio Calabria, Università della Calabria, Italy; Université Libre de Bruxelles, Belgium; Monash University, Australia; BWN Lab @ Georgia Tech, CPS Lab @ Rutgers University, WINES @ University of New York, USA; Lakeside Lab @ Klagenfurt University, Austria), and 22 different co-authors.

Competencies in applying research findings

– Patent

"Positioning system based on GSM with zero impact on the network provider's infrastructure," E. Natalizio, V. Loscri', E. Viterbo, G. d'Aquila, G. Brasili, and F. Iachini. Italian national patent approved and pending.

In 2006, Titan Lab (Telecommunication & Information Theory for Advanced Networking) at the University of Calabria was contacted by e-Guide (now Infomobility: http://www.infomobility.it/) in order to create an industrial-university partnership based on some common research & development issues. e-Guide wanted to develop some localization techniques for GSM users not equipped with GPS.

Enrico Natalizio was chosen by Prof. Emanuele Viterbo to lead the research project due to his knowledge of resource and mobility management in cellular systems. Along with Prof. Viterbo, he modelled the problem through a mathematical formulation, proposed some new techniques of localization and supervised the work of Daniela Mauro, a Master's student, in the simulation of those ideas in Matlab. Due to good simulation results, e-Guide decided to try a pilot test through a software implementation inside the insurance company black box mounted on some test vehicles. In the implementation phase, Enrico helped the developer from e-Guide, only by individuating the most important parameters that the black box had to exchange with the cellular system base station in order to permit the correct functioning of the techniques. The tests were successful and a national patent was prepared and presented to the Liaison Office of the University of Calabria. When the decision to write the patent was made, Enrico was in charge of following the process that led to the approved version of the patent in late 2009. In the meantime Infomobility converted its core business to public administration needs, and did not want to pay the fees for its publication. Therefore, the patent publication is still pending.

– Testbed implementations

Since the candidate started working at INRIA Lille – Nord Europe, he has had the possibility to coordinate the implementation into real testbeds of the schemes of controlled mobility he studied and proposed by theoretical analysis and simulation. In particular, by supervising the work of two Ph.D. Candidates, Milan Erdelj and Karen Miranda, who are working on the implementation of deployment schemes for robot and substitution networks, respectively, the candidate has acquired the knowledge needed to transform theoretical schemes into practical implementations. In despite of the short time spent at INRIA, the supervision produced 2 International Conference invitations and 2 Conference submissions.

Furthermore, in his previous experience at the Università della Calabria, he had already designed and implemented a GSM BTS through GNU Radio and Universal Software Radio Peripheral.

Postgraduate student supervision and evaluation

Ph.D. dissertations in progress/completed:

⚔ *"Security and reliability of swarm communications"*, Lotfi Zaouche, Ph.D. at Université de Technologie de Compiègne, France October 2013 – February 2017 (50% supervision).

⚔ *"Reliable routing in highly dynamic networks",* Nourhene Maalel, Ph.D. at Université de Technologie de Compiègne, France September 2011 – June 2014 (33% supervision).

⚔ *"Controlled mobility in Wireless Sensor and Robot Networks",* Carmelo Costanzo, Ph.D. in Systems and Computer Engineering at University of Calabria, Italy, January 2009 - December 2011. The continuous support and supervision of Carmelo's work has produced 3 International Conference invitations, 3 International journal papers, as well as 2 more submissions to International journals. The content of Carmelo's work focuses on the analysis and simulation of controlled mobility in wireless sensor and robot networks. The main objective is to prove the beneficial effects of including the mobility of devices among the control primitives of the network. (75% supervision).

⚔ *"Algorithms for mobile sensor deployment",* Milan Erdelj, Ph.D. in Computer Science at INRIA Lille – Nord Europe, France, October 2010. The supervision of Milan's work has produced 1 International Conference invitation and 1 submission. The content of Milan's work focuses on the definition and implementation in a real test-bed available at INRIA Lille of mobile sensors and robots schemes for field exploration, coverage and connectivity. (50% supervision).

⚔ *"Self-deployment algorithms for substitution networks"*, Karen Miranda, Ph.D. in Computer Science at INRIA Lille – Nord Europe, France, January 2011. The supervision of Karen's work has produced 1 International Conference invitation for poster presentation and 1 submission. The content of Karen's work focuses on the definition of techniques to discover the optimal placements of relay nodes for multimedia traffic in terms of users' perceived quality. The techniques are based on the practical implementation on a real testbed available at INRIA Lille. (50% supervision).

Participation in PhD defence committee:

⚔ February 27th 2017 – Raul Armando Fuentes Samaniego, Wireless Sensors Networks Monitoring – Application to secure interoperability @ Telecom SudParis, Paris, France. Members of the committee: Ana Cavalli, Joaquin Garcia-Alfaro, Edgardo Montes Deoca, Emmanuel Lochin, Mercedes Merayo, Enrico Natalizio.

⚔ December 2nd 2016 – Thouraya Toukabri, CVS: a Framework architecture for D2D-based Cellular Vehicular Services in 4G networks and beyond @ Telecom SudParis, Paris, France. Members of the committee: Pascal Lorenz, Ken Chen, Houda Labiod, Hossam Afifi, Nabil Charkani, Lionel Morand, Enrico Natalizio.

⚔ February 1st, 2016 - Alvaro Torres Cortés, Efficient real-time video delivery in vehicular networks @ Universitat Politècnica de València, Valencia, Spain. Members of the committee: Juan Pedro Rodriguez Lopez, Antonella Molinaro, Enrico Natalizio.

⚔ December 15th, 2015 - Natale Guzzo, Facing the real challenges in wireless sensor network-based applications: An adaptive cross-layer self-organization WSN protocol @ Inria Lille - Nord Europe, Lille, France. Members of the committee: David Symplot-Ryl, Andre-Luc Beylot, Fabrice Valois, Pascal Daragon, Enrico Natalizio.

⚔ February 26th, 2015 - Rosario Surace, Design and Performance Evaluation of Algorithms for Wireless Self-Organizing Systems @ Università della Calabria, Cosenza, Italy. Members of the committee: Lalo Magni, Giuseppe Mazzarella, Enrico Natalizio. PhD degree in Computer and Systems Engineering.

Master's and Bachelor's students' theses supervision:

From 2004 to 2010, the candidate supervised the final project and thesis work of **14** Master's students from the Telecommunications Engineering degree course at the Università della Calabria and 14 Bachelor's student from the Computer and Electronics Engineering degree course at the Università della Calabria.

3. TEACHING QUALIFICATIONS
Teaching experience

At the Université de Technologie de Compiègne:

From 2015 Responsible of the courses "**Web applications design and architecture**" (SR03), "**JEE Architecture and web services**" (API01), "**Web programming and security**" (API07), "**Advanced networking**" (TIS07).

2012-2015 Responsible of the course "**Systems, networks and security**" (SR06).

Academic year	Institution	# of hours taught (équivalent TD – base 192h)	Décharges / CRCT / Délégation CNRS obtenus… (précisez)
2013 - 2014	Université de Technologie de Compiègne	270	None
2014 - 2015	Université de Technologie de Compiègne	404	None
2015 - 2016	Université de Technologie de Compiègne	445	None
2016 - 2017	Université de Technologie de Compiègne	400	None

At the University of Calabria:

2010 March to June – **Contract professor of "Signal Theory"**, an undergraduate course in the Electrical Engineering degree course at the University of Calabria, 90 hours. The course was split in three parts: the theoretical part (60 hours) had the objective to provide the students with the knowledge of the main characteristics of the signals, their statistical properties and their modelization; tutorials (20 hours) was intended to give the students the possibility to familiarize themselves with the concepts studied in the theoretical part by showing them practical applications;

laboratory (10 hours) to allow students to use modern software of signal modelization to put in practice the concept studied in the other two parts of the course.

2010 February to April – **Contract professor of "Open Source tools for Networking"**, a Master's course for Open Source experts and researchers, in the framework of OPENKNOWTECH organized by University of Calabria and the Italian Ministry for Education, University and Research (MIUR), 40 hours. The course was split in two parts: study (30 hours) was meant to provide the students with concepts, advantages and issues of the open source tools used for networking, and implementation (10 hours) where the students had to implement a basic software defined radio system by off-the-shelf technology.

2009 April to June – **Contract professor of "Foundations of Telecommunications"**, an undergraduate course in the Electrical Engineering degree course at the University of Calabria, 50 hours. The course was split in two parts: theoretical (26 hours) had the objective to provide the students with the theoretical knowledge and the standard techniques of the modern digital and analog Telecommunication Systems, and practical (24 hours) was meant to show the students the functioning of real Telecommunication Systems by practical exercises and hands-on experience.

2009 September to October – **Contract professor of "Math and logic"** at the Political Science Faculty and of "Computer science" at the Pharmacy Faculty for Introductory Universities Studies at the University of Calabria, 24 hours. The objective of the course was to give first year students the basic concepts of mathematics and logic needed for their degree courses.

2008 April to June – **Contract professor of "Foundations of Telecommunications"**, an undergraduate course in the Computer Engineering degree course at the University of Calabria, 46 hours. The course was split in two parts: theoretical (33 hours) had the objective to provide the students with the theoretical knowledge and the standard techniques of the modern digital and analog Telecommunication Systems, and practical (13 hours) was meant to show the students the functioning of real Telecommunication Systems by practical exercises.

2008 September to October – **Contract professor of "Math and logic"** at the Political Science Faculty and of "Computer science" at the Pharmacy Faculty and Engineering Faculty for Introductory Universities Studies at the University of Calabria, 24 hours. The objective of the course was to give first year students the basic concepts of computer science, mathematics and logic needed for their degree courses.

2007 February to March – **Contract professor of "Wireless communication networks"**, a Master's course for industrial researchers and technicians, in the framework of PILOT (Piattaforma di Interoperabilita' per la LOgistica ed i Trasporti) organized by Etnoteam, Universita' della Calabria and Universita' "Mediterranea" di Reggio Calabria and the Italian Ministry for Education, University and Research (MIUR), 24 hours. The course had to provide students with the knowledge of modern wireless communication networks, their functioning and their applications.

2007 April to June – **Contract professor of "Foundations of Telecommunications"**, an undergraduate course in the Computer Engineering degree course at the University of Calabria, 46 hours. The course was split in two parts: theoretical (33 hours) had the objective to provide the students with the theoretical knowledge and the standard techniques of the modern digital and analog Telecommunication Systems, and practical (13 hours) was meant to show the students the functioning of real Telecommunication Systems by practical exercises.

2006 April to June – **Contract professor of "Foundations of Telecommunications"**, an undergraduate course in the Computer Engineering degree course at the University of Calabria, 46 hours. The course was split in two parts: theoretical (33 hours) had the objective to provide the students with the theoretical knowledge and the standard techniques of the modern digital and analog Telecommunication Systems, and practical (13 hours) was meant to show the students the functioning of real Telecommunication Systems by practical exercises.

2005 January to March – **Teaching assistant of "Mobile Networks II"**, a master's course in the Telecommunication Engineering master course at the University of Calabria, 12 hours. The course (46 hours) was meant to give the students the most important concepts related to mobile networks, such as cellular systems, ad hoc networks, mobile sensor networks, satellite systems. The teaching assistant illustrated recent research studies related to the topics of study in the course to the students.

2004 January to June – **Teaching assistant of "Telematics"**, a master's course in the Computer Engineering master course at the University of Calabria, 30 hours. The course (90 hours) had the objective to provide the students with the detailed knowledge of the ISO/OSI protocol stack. The teaching assistant had the role to illustrate the functioning of the TCP/IP protocol stack by practical experiments.

2003 January to June – **Teaching assistant of "Foundations of Telecommunications"**, an undergraduate course in the Computer Engineering degree course at the University of Calabria, 30 hours. The course (90 hours) was split in two parts: theoretical (60 hours) had the objective to provide the students with the theoretical knowledge and the standard techniques of the modern digital and analog Telecommunication Systems, and practical (30 hours) was meant to show the students the functioning of real Telecommunication Systems by practical exercises. The teaching assistant was in charge for the practical part.

Pedagogical training

In order to improve his teaching skills, the candidate periodically follows courses of the MIT OpenCourseWare. Specifically, in the last few years, he has attended the "virtual" classes of Computer Networks, Information Theory,

Internet Research Problem, Principles of Digital Communications, Technologies for Creative Learning, Brain and Cognitive Sciences, which match his research and teaching interests.

Ability to produce teaching materials

For all the courses of which the candidate was a Contract Professor from 2006 to 2010 at the Faculty of Engineering at the Università della Calabria, he personally produced the slides used during the classes, as well as the exercises, and the computer code used to illustrate the examples. The material is still available on the Faculty website (http://icampus.ingegneria.unical.it).

5. LIST OF PUBLICATIONS

Peer-reviewed scientific articles

Original scientific article

1. O. Alvear, C.T. Calafate, N.R. Zema, E. Natalizio, et al., A Discretized Approach to Air Pollution Monitoring Using UAV-based Sensing, Mobile Network Application, 2018. https://doi.org/10.1007/s11036-018-1065-4.
2. M. Erdelj, O. Saif, E. Natalizio, I. Fantoni-Coichot, UAVs that Fly Forever: Uninterrupted Structural Inspection through Automatic UAV Replacement, Elsevier Ad Hoc Networks, Available online 12 December 2017, ISSN 1570-8705, https://doi.org/10.1016/j.adhoc.2017.11.012.
3. N. Zema, A. Trotta, E. Natalizio, M. Di Felice, L. Bononi, The CUSCUS simulator for Distributed Networked Control Systems: Architecture and Use-cases, Elsevier Ad Hoc Networks, vol. 68, pp. 33-47, 2018. doi: 10.1016/j.adhoc.2017.09.004.
4. M. Erdelj, M. Krol, E. Natalizio, *"Wireless Sensor Networks and Multi-UAV Systems for Natural Disaster Management,"* Elsevier Computer Networks, vol. 124, pp. 72-86, 2017. doi: 10.1016/j.comnet.2017.05.021.
5. S. Yahiaoui, M. Omar, A. Bouabdallah, E. Natalizio, Y. Challal, An energy efficient and QoS aware routing protocol for wireless sensor and actuator networks, AEU - International Journal of Electronics and Communications, vol. 83, pp. 193-203, ISSN 1434-8411, 2018. https://doi.org/10.1016/j.aeue.2017.08.045.
6. S. Manfredi, E. Natalizio, C. Pascariello, N. Zema, *"A Packet Loss Tolerant Rendezvous Algorithm for Wireless Networked Robot Systems,"* Asian Journal of Control, vol. 19, no. 5, pp. 1-11, September 2017. doi: 10.1002/asjc.1470.
7. A. Gogu, D. Nace, E. Natalizio, Y. Challal, *"Using dynamic programming to solve the Wireless Sensor Network Configuration Problem,"* Elsevier Journal of Network and Computer Applications, vol. 83, pp. 140-154, April 2017.
8. A. Sfar, E. Natalizio, Y. Challal, Z. Chtourou, *"A roadmap for security challenges in Internet of Things,"* Elsevier Digital Communications and Networks, 2017. doi: 10.1016/j.dcan.2017.04.003
9. O. Alvear, N Zema, E. Natalizio, C. Calafate, *"Using UAV-Based Systems to Monitor Air Pollution in Areas with Poor Accessibility,"* Journal of Advanced Transportation, vol. 2017, Article ID 8204353, 14 pages, 2017. doi: 10.1155/2017/8204353.
10. T. Razafindralambo, M. Erdelj, D. Zorbas, E. Natalizio, *"Spread and Shrink: Point of Interest Discovery and Coverage with Mobile Wireless Sensors,"* Elsevier Journal of Parallel and Distributed Computing, vol. 102, pp. 16-27, April 2017. doi: 10.1016/j.jpdc.2016.09.003.
11. M. Erdelj, E. Natalizio, K. R. Chowdhury, I. F. Akyildiz, *"Help from the Sky: Leveraging UAVs for Disaster Management,"* IEEE Pervasive Computing, IEEE Pervasive Computing, vol. 16, no. 1, pp. 24-32, Jan.-Mar. 2017.
12. N. Zema, E. Natalizio, G. Ruggeri, M. Poss, and A. Molinaro, *"MeDrone: On the use of a medical drone to heal a sensor network infected by a malicious epidemic,"* Elsevier Ad Hoc Networks, Volume 50, Page 115-127, November 2016.
13. X. Wang, Y. A. Sekercioglu, T. Drummond, E. Natalizio, I. Fantoni, and V. Fremont, *"Fast Depth Video Compression for Mobile RGB-D Sensors,"* IEEE Transactions on Circuits and Systems for Video Technology, vol. 26, no. 4, pp. 673-686, April 2016. doi: 10.1109/TCSVT.2015.2416571.
14. A. Vegni, E. Natalizio, *"Forwarder Smart Selection Protocol for Limitation of Broadcast Storm Problem,"* Elsevier Journal of Network and Computer Applications, 10.1016/j.jnca.2014.08.009.
15. A. Vegni, E. Natalizio, *"A hybrid (N/M)CHO soft/hard vertical handover technique for heterogeneous wireless networks,"* Elsevier Ad Hoc Networks, Volume 14, Page 51-70, March 2014.
16. G. Aloi, L. Bedogni, M. Di Felice, V. Loscrì, A. Molinaro, E. Natalizio, P. Pace, G. Ruggeri, A. Trotta, N. R. Zema, *"STEM-Net: an evolutionary network architecture for smart and sustainable cities,"* Transactions on Emerging Telecommunications Technologies, Volume 25, Page 21-40, 2014.
17. F. Guerriero, R. Surace, V. Loscrì, E. Natalizio, *"A Multi-objective Approach for Unmanned Aerial Vehicle Routing Problem with Soft Time Windows Constraints,"* Elsevier Applied Mathematical Modelling, Volume 38, Issue 3, Page 839-852, 2014.
18. M. Erdelj, V. Loscrì, E. Natalizio, T. Razafindralambo, *"Multiple point of interest discovery and coverage with mobile wireless sensors,"* Elsevier Ad Hoc Networks, Volume 11, Issue 8, Page 2288-2300, 2013.
19. E. Natalizio, V. Loscrì, *"Controlled Mobility in Mobile Sensor Networks: Advantages, Issues and Challenges,"* Springer Telecommunication Systems, Special Issue on Recent Advance in Mobile Sensor Networks, Volume 52, Issue 4, Page 2411-2418, 2013. DOI: 10.1007/s11235-011-9561-x.
20. K. Miranda, E. Natalizio, T. Razafindralambo, *"Adaptive Deployment Scheme for Mobile Relays in Substitution Networks,"* International Journal of Distributed Sensor Networks, 2012.
21. C. Costanzo, V. Loscrì, E. Natalizio, T. Razafindralambo, *"Nodes self-deployment for coverage maximization in mobile robot networks using an evolving neural network,"* Elsevier Computer Communications, Special Issue on Wireless Sensor and Robot Networks: Algorithms and Experiments, Volume 35 Issue 9, May 2012, Pages 1047-1055. DOI: http://dx.doi.org/10.1016/j.comcom.2011.09.004.
22. F. Guerriero, A. Violi, E. Natalizio, V. Loscrì, C. Costanzo, *"Modelling and Solving Optimal Placement problems in Wireless Sensor Networks,"* Elsevier Applied Mathematical Modelling, Volume 35, Issue 1, January 2011, Pages 230-241.

23. E. Natalizio, P. Pace, A. Violi, F. Guerriero, "*A reactive and dependable transport protocol for wireless mesh networks*," Elsevier Journal of Parallel and Distributed Computing, vol.70, no. 5, pp. 431-442, May 2010.

24. V. Loscrì, E. Natalizio, C. Costanzo, "*Simulations of the impact of Controlled Mobility for Routing Protocols,*" EURASIP Journal on Wireless Communications and Networking, Special Issue on Simulators and Experimental Testbeds Design and Development for Wireless Networks, vol. April 2010, doi:10.1155/2010/315381.

25. E. Natalizio, V. Loscrì, A. Violi, F. Guerriero, "*Energy Spaced Placement for Bidirectional Data Flows in Wireless Sensor Network*," IEEE Communications Letters, vol. 13, no. 1, pp. 22-24, January 2009.

26. E. Natalizio, V. Loscri, and E. Viterbo: "*Optimal Placement of Wireless Nodes for Maximizing Path Lifetime*," IEEE Communications Letters, vol. 12, no. 5, pp. 362-364, May 2008.

27. A. Iera, A. Molinaro, S. Marano, E. Natalizio, "*Call Management Based on the Mobile Terminal-Peak Velocity: Virtues and Limitations in a Two-Tier Cellular System*," IEEE Transactions on Vehicular Technology, vol. 52, no.4, July 2003.

Contribution to book

1. N. El Zoghby, V. Loscrì, E. Natalizio, V. Cherfaoui, "*Robot Cooperation and Swarm Intelligence, in Wireless Sensor and Robot Networks: From Topology Control to Communication Aspects*," World Scientific Publishing Company, Chapter 8, Pages 168-201, 2014.

2. M. Erdelj, N. Mitton, E. Natalizio, "*Applications of Industrial Wireless Sensor Networks*," Chapter 1 in Industrial Wireless Sensor Networks, CRC Press 2012.

3. V. C. Gungor, E. Natalizio, P. Pace, and S. Avallone, "*Challenges and Issues in Designing Architectures and Protocols for Wireless Mesh Networks*," Chapter 1 in Wireless Mesh Networks: Architectures, Protocols, and Applications, Springer-Verlag, 2007.

Article in conference publication

1. A. Trotta, F. D'Andreagiovanni, M. di Felice, E. Natalizio, K. Chowdhury, When UAVs ride a bus: Towards energy-efficient city-scale video surveillance, IEEE International Conference on Computer Communications (INFOCOM), Honolulu, Hawaii, USA, April 2018.

2. N. Mahdoui, V. Frémont, E. Natalizio, Cooperative Navigation Strategy for Micro-Aerial Vehicles Fleet, IEEE International Conference on Multisensor Fusion and Integration for Intelligent Systems (MFI), Daegu, Korea, November 2017.

3. B. M. Masini, A. Bazzi, E. Natalizio, Radio Access for Future 5G Vehicular Networks, Invited paper at the IEEE Vehicular Technology Conference (VTC Fall), Toronto, Canada, September 2017.

4. L. Di Puglia Pugliese, F. Guerriero, E. Natalizio, N. Zema, A biobjective formulation for filming sport events problem using drones, The 9th IEEE International Conference on Intelligent Data Acquisition and Advanced Computing Systems (IEEE IDAACS): Technology and Applications, Bucharest, Romania, September 2017.

5. O. P. Alvear, N. Zema, E. Natalizio, C. Tavares Calafate, A chemotactic pollution-homing UAV guidance system, Advanced Industustrial Nets & Intelligent Systems-AINIS Symposium at IEEE Wireless Communications and Mobile Computing (IWCMC), Valencia, Spain, June 2017.

6. N. Zema, E. Natalizio, E. Yanmaz, An Unmanned Aerial Vehicle Network for Sport Event Filming with Communication Constraints, First International Balkan Conference on Communications and Networking 2017 (BALKANCOM), Tirana, Albania, May 2017.

7. F. D'Andreagiovanni, D. Nace, A. Nardin, E. Natalizio, Robust relay node placement in body area networks by heuristic min-max regret, First International Balkan Conference on Communications and Networking 2017 (BALKANCOM), Tirana, Albania, May 2017.

8. A. Riahi, E. Natalizio, Y. Challal, Z. Chtourou, A Markov game privacy preserving model in retail applications, The 7th International conference on selected topics in Mobile and Wireless Networking (MoWNet), Avignon, 2017, pp. 1-8. doi: 10.1109/MoWNet.2017.8045953.

9. F. D'Andreagiovanni, A. Nardin, E. Natalizio, "*A Fast ILP-Based Heuristic for the Robust Design of Body Wireless Sensor Networks*," In: G. Squillero and K. Sim (Eds.): EvoApplications 2017, Part I, LNCS 10199, pp. 1–17, 2017. doi: 10.1007/978-3-319-55849-3_16.

10. M. Krol, E. Natalizio, N. Zema, "*Tag-based Data Exchange in Disaster Relief Scenarios*," The 10th International Workshop on Wireless Sensor, Actuator and Robot Networks (WiSARN) @ International Conference on Computing, Networking and Communications (ICNC 2017), Silicon Valley (United States) 2017.

11. N. Zema, A. Trotta, G. Sanahuja, E. Natalizio, M. Di Felice, L. Bononi, "*CUSCUS: An integrated simulation architecture for Distributed Networked Control Systems*," The 14th Annual IEEE Consumer Communications & Networking Conference (CCNC), Las Vegas, (United States) 2017.

12. X. Wang, A. Sekercioglu, T. Drummond, E. Natalizio, I. Fantoni, V. Frémont, Collaborative Multi-Sensor Image Transmission and Data Fusion in Mobile Visual Sensor Networks Equipped with RGB-D Cameras, IEEE International Conference on Multisensor Fusion and Integration for Intelligent Systems (MFI), Baden-Baden, Germany, September 2016.

13. M. Erdelj, E. Natalizio, "*UAV-assisted disaster management: Applications and open issues*," The 9th International Workshop on Wireless Sensor, Actuator and Robot Networks (WiSARN) @ International Conference on Computing, Networking and Communications (ICNC 2016), Kauai (United States) 2016.

14. N. Mahdoui, E. Natalizio, V. Frémont, "*MultiUAVs Network Communication Study for Distributed Visual Simultaneous Localization and Mapping*," The 9th International Workshop on Wireless Sensor, Actuator and Robot Networks (WiSARN) @ International Conference on Computing, Networking and Communications (ICNC 2016) , Kauai (United States) 2016.

15. L. Zaouche, E. Natalizio, A. Bouabdallah, "*ETTAF: Efficient Target Tracking and Filming with a Flying Ad Hoc Networks*," The 1st International Workshop on Experiences with the Design and Implementation of Smart Objects (SMARTOBJECT) @ The 21st ACM Conference on Mobile Computing and Networking (Mobicom), Paris (France) 2015.

16. V. Loscrì, E. Natalizio, F. Guerriero, N. Mitton, "*Efficient Coverage for Grid-Based Mobile Wireless Sensor Networks*," The 17th ACM International Conference on Modeling, Analysis and Simulation of Wireless and Mobile Systems (MSWiM), 2014.

17. N. Zema, E. Natalizio, M. Poss, G. Ruggeri, A. Molinaro, "*Healing Wireless Sensor Networks from Malicious Epidemic Diffusion*," The 11th IEEE International Conference on Distributed Computing in Sensor Systems (DCOSS), Marina del Rey (USA), 2014.

18. V. Loscrì, E. Natalizio, N. Mitton, "*Performance Evaluation of Novel Distributed Coverage Techniques for Swarms of Flying Robots*," The 12th IEEE Wireless Communications and Networking Conference (WCNC), Instanbul (Turkey), 2014.

19. L. Zaouche, S. Aitarab, A. Khireddine, M. Omar, E. Natalizio, M. Bouabdallah, "*A reputation-based approach using collaborative indictment/exculpation for detecting and isolating selfish nodes in MANETs*," International conference on advanced Networking, Distributed Systems and applications (INDS 2014), Béjaia (Algeria), 2014.

20. A. Riahi, E. Natalizio, Y. Challal, N. Mitton, A. Iera, "*A systemic and cognitive approach for IoT security*," Invited paper at the International Conference on Computing, Networking and Communications (ICNC), Honolulu (USA), 2014.

21. E. Natalizio, R. Surace, V. Loscrì, F. Guerriero, T. Melodia, "*Two Families of Algorithms to Film Sport Events with Flying Robots*," The 10th IEEE International Conference on Mobile Ad-hoc and Sensor Systems (MASS), Hangzhou (China), October 2013.

22. N. Mitton, E. Natalizio, R. Wolhuter, "*Beacon-less mobility assisted energy efficient georouting in energy harvesting actuator and sensor networks*," The 12th International Conference on Ad Hoc Networks and Wireless (ADHOC-NOW), Wroclaw (Poland), July 2013.

23. V. Loscrì, E. Natalizio, T. Razafindralambo, N. Mitton, "*Distributed Algorithm to Improve Coverage for Mobile Swarms of Sensors*," 2013 IEEE International Conference on Distributed Computing in Sensor Systems (DCOSS), Boston (USA), 20-23 May 2013.

24. A. Riahi, Y. Challal, E. Natalizio, Z. Chtourou, A. Bouabdallah, "*A Systemic Approach for IoT Security*," 1st International workshop on Internet of Things - Ideas and Perspectives @ IEEE International Conference on Distributed Computing in Sensor Systems (DCOSS), Boston (USA), 20-23 May 2013.

25. N. Maalel, E. Natalizio, A. Bouabdallah, P. Roux, M.E. Kellil, "*Reliability for Emergency Applications in Internet of Things*," 1st International workshop on Internet of Things - Ideas and Perspectives @ IEEE International Conference on Distributed Computing in Sensor Systems (DCOSS), Boston (USA), 20-23 May 2013.

26. A.M. Vegni, E. Natalizio, A. Stramacci, "*Opportunistic Clusters Selection in a Reliable Enhanced Broadcast Protocol for Vehicular Ad hoc Network*," Poster session, IEEE/IFIP Conference on Wireless On demand Network Systems and Services (WONS), 2013.

27. V. Loscrì, E. Natalizio, G. Aloi, "*A novel Communication Technique for Nanobots based on acoustic signals*," 7th International Conference on Bio-Inspired Models of Network, Information, and Computing Systems (BIONETICS), 2012.

28. V. Loscrì, E. Natalizio, F. Guerriero, G. Aloi, "*Particle Swarm Optimization Schemes Based on Consensus for Wireless Sensor Networks*," The 15th ACM International Conference on Modeling, Analysis and Simulation of Wireless and Mobile Systems (MSWiM), 2012.

29. K. Miranda, E. Natalizio, T. Razafindralambo, A. Molinaro, "*Adaptive Router Deployment for Multimedia Services in Mobile Pervasive Environments,*" Work in Progress session, The 10th IEEE Pervasive Computing and Communication conference (PerCom), 2012.

30. A.M. Vegni, A. Stramacci, E. Natalizio, "*SRB: A Selective Reliable Broadcast Protocol for Safety Applications in VANET,*" International Conference on Selected Topics in Mobile & Wireless Networking (iCost), 2012.

31. V. Loscrì, E. Natalizio, V. Mannara, G. Aloi, "*Acoustic Communication Techniques for Nanobots,*" 7th International Conference on Body Area Networks, BodyNets 2012.

32. M. Erdelj, E. Natalizio, T. Razafindralambo, "*Multiple Point of Interest Discovery and Coverage with Mobile Wireless Sensors*," International Workshop on Mobility and Communication for Cooperation and Coordination (MC3) @ International Conference on Computing, Networking and Communications (ICNC), 2012.

33. R. Surace, V. Loscrì, E. Natalizio, "*On the Impact of the Propagation Environment on Controlled Mobility Algorithms*," International Workshop on Mobility and Communication for Cooperation and Coordination (MC3) @ International Conference on Computing, Networking and Communications (ICNC), 2012.

34. P. Pace, V. Loscrì, E. Natalizio, T. Razafindralambo, "*Nodes Placement for reducing Energy Consumption in Multimedia Transmissions,*" in IEEE Personal Indoor Mobile and Radio Communications (PIMRC), 2011.

35. G. Aloi, A. Borgia, S. Costanzo, G. Di Massa, V. Loscrì, E. Natalizio, P. Pace, F. Spadafora, "*Software Defined Radar: synchronization issues and practical implementation,*" invited paper to ISABEL 2011, Barcelona, October 26-29, 2011.

36. K. Miranda, E. Natalizio, T. Razafindralambo, "*On the impact of router's mobility on substitution networks,*" in Twelfth ACM International Symposium on Mobile Ad Hoc Networking and Computing, Paris, France, May 2011 (*poster*).

37. E. Natalizio, V. Loscrì, G. Aloi, N. Paoli, "T*he practical experience of implementing a GSM BTS through Open Software/Hardware,*" invited paper to ISABEL 2010, Rome, November 8-10, 2010.

38. C. Costanzo, V. Loscrì, and E. Natalizio, "*Distributed Virtual-Movement Scheme for Improving Energy Efficiency in Wireless Sensor Networks,*" The 12th ACM International Conference on Modeling, Analysis and Simulation of Wireless and Mobile Systems (MSWiM), Tenerife, October 26-30, 2009, Pages 297-304, 2009.

39. V. Loscrì, E. Natalizio, C. Costanzo, F. Guerriero, A. Violi, "*Optimization Models for Determining Performance Benchmarks in Wireless Sensor Networks,*" in Proceedings of IARIA SENSORCOMM, Athens, June 18-23, 2009, Pages 333-338.

40. V. Loscrì, E. Natalizio, E. Viterbo, D. Mauro, "*Carrier Independent Localization Techniques for GSM Terminals,*" in IEEE Personal Indoor Mobile and Radio Communications (PIMRC), 2008, Pages 1-5.

41. V.C. Gungor, P. Pace, E. Natalizio, "*AR-TP: An Adaptive and Responsive Transport Protocol for Wireless Mesh Networks,*" Proceeding of IEEE International Conference on Communications (ICC), Glasgow, Scotland, June 2007, Pages 3740-3745.

42. P. Pace, E. Natalizio, "*Wireless Communication Networks via Aerial Platforms: Dynamic Fair Power Sharing Admission Control for UMTS real time traffic sources*", Proceedings of the 14th IEEE International Conference On Telecommunications (ICT), Penang, Malaysia, May 14-17, 2007.

43. E. Natalizio, G. Aloi, "*Exploiting Recurrent Paths of Vehicular Users in a Third Generation Cellular System Urban Scenario*", IEEE Personal Indoor Mobile and Radio Communications (PIMRC), 2006.

44. E. Natalizio, A. Molinaro, S. Marano, "*Packet Scheduling Algorithms for Providing QoS on UMTS Downlink Shared Channels*", Vehicular Technology Conference, 2005. VTC 2005-Fall. 2005 IEEE 62nd.

45. P. Pace, E. Natalizio, "*Dynamic Fair Power Sharing Admission Control for HAP-UMTS communication system,*" Proceedings of "IST Mobile and Wireless Communications Summit", Budapest, July 1-5, 2007.

46. E. Natalizio, A. Scicchitano, S. Marano, "*Mobility Anchor Point Selection Based on User Mobility in HMIPv6 Integrated with Fast Handover Mechanism*", IEEE Wireless Communications and Networking Conference (WCNC), 2005, Vol.3, 13-17 March 2005, Pages: 1434-1439.

47. P. Pace, G. Aloi, F. De Rango, E. Natalizio, A. Molinaro, S. Marano, "*An integrated Satellite-HAP-Terrestrial system architecture: resources allocation and traffic management issues*". Proceedings of the IEEE Vehicular Technology Conference (VTC Spring), Milano - Italy, May, 2004.

48. E. Natalizio, A. Molinaro, S. Marano, "*Reducing packet loss in hierarchical mobile IPv6*", IEEE Personal, Indoor and Mobile Radio Communications (PIMRC), 2004, Volume: 3, 5-8 September 2004, Pages: 1876-1880, Vol.3.

49. E. Natalizio, A. Molinaro, S. Marano, "The Effect of a Realistic Urban Scenario on the Performance of Algorithms for Handover and Call Management in Hierarchical Cellular Systems", International Conference on Telecommunications, 2004. IEEE 2004 11th ICT. 1-6 August 2004, Pages 1143-1150.

Publications directed at societies of experties
Published development or research report
1. E. Natalizio, "*Cellular Techniques for a Multitier Urban Scenario*", Report CNIT, June 2002.

Thesis
Master's thesis
1. "*Improvements in Radio Resources Management in a Hierarchical Cellular System*", E. Natalizio. Master degree in Computer engineering obtained in May 2001, magna cum laude, from University of Calabria.

Doctoral Thesis, monography
1. "*New Algorithms of Mobility and Resource Management for Wireless Networks*", E. Natalizio, Ph.D. dissertation in Computer and Systems Engineering, obtained in December 2005 from University of Calabria.

Patents and invention reports
Patents
1. "Positioning system based on GSM with zero impact on the network provider's infrastructure," E. Natalizio, V. Loscri', E. Viterbo, G. d'Aquila, G. Brasili, and F. Iachini, Italian national patent approved and pending.