

# Presentation of Research Activities

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## Biography

Giovanni Giambene ([giambene@unisi.it](mailto:giambene@unisi.it)) Giovanni Giambene was born in Florence, Italy, in 1966. He received the Dr. Ing. degree in Electronics in 1993 and the Ph.D. degree in Telecommunications and Informatics in 1997, both from the University of Florence, Italy. From 1994 to 1997, he was with the Electronic Engineering Department of the University of Florence, Italy. He was Technical External Secretary of the European Community COST 227 Action ("Integrated Space/Terrestrial Mobile Networks"). He also contributed to the SAINT Project ("Satellite Integration in the Future Mobile Network", RACE 2117). From 1997 to 1998, he was with OTE of the Marconi Group, Florence, Italy, where he was involved in a GSM development program. In the same period he also contributed to the COST 252 Action ("Evolution of Satellite Personal Communications from Second to Future Generation Systems") research activities by studying PRMA protocols for voice and data transmissions in low earth orbit mobile satellite systems. In 1999, he joined the Information Engineering Department of the University of Siena, Italy, first as research associate and then as assistant professor and aggregate professor. He teaches the advanced course of Telecommunication Networks at the University of Siena. From 1999 to 2003 he participated to the project "Multimedialità", financed by the Italian National Research Council (CNR). From 2000 to 2003, he contributed to the "Personalised Access to Local Information and services for tourists" (PALIO) IST Project within the EU FP5 programme. He was vice-Chair of the COST 290 Action (<http://www.cost290.org/>) for its whole duration 2004-2008, entitled "Traffic and QoS Management in Wireless Multimedia Networks" (Wi-QoS). He participated to the SatNEX I & II network of excellence (FP6 programme, 2004-2009) as work package leader of two groups on radio access techniques and cross-layer air interface design for satellite communication systems (<http://www.satnex.org/>). He also participates to the FP7 Coordination Action "Road mapping technology for enhancing security to protect medical & genetic data" (RADICAL) as work package leader (<http://www.radicalhealth.eu/>), to the ESA founded SatNEX III research project, and to the COST Action IC0906 "Wireless Networking for Moving Objects" (WiNeMO). Giambene is IEEE senior member. He has published the following books: G. Giambene, "Queuing Theory and Telecommunications: Networks and Telecommunications", Springer, May 2005; G. Giambene (Ed.), "Resource Management in Satellite Networks: Optimization and Cross-Layer Design", Springer, April 2007.



## Recent Research Topics

- End-to-end performance and QoS support in hybrid networks (e.g., train scenario with tunnels): Vertical handover and transport layer issues
- Cross-layer air interface design (transport-network-MAC)
- Security and privacy (grid/cloud computing & e-health scenarios)
- WiMAX MAC analysis with Markov chain (e.g., queuing model in the non-saturated case and the optimization of the air I/F)
- MIH, BSM, DVB-RCS, DVB-S2, IEEE 802.16d,e,m



## Other Interests

- Multicast protocols (e.g., NORM)
- Routing and use of different path metrics (depending on traffic jam, road works, etc.);
- Wireless sensor networks interconnected with cellular&wireless networks (hybrid systems) for collecting on board information and better route planning.



## Current Projects

- ESA SatNEx project is focusing on the innovative study in the field of satellite communications and networking (<http://www.satnex3.org/>). He has organized the project Summer School 2011 (<http://satnexiiisummerschool2011.dii.unisi.it/index.html>).
- National representative of the COST IC906 WiNeMo "Wireless Networking for Moving Objects" EU project (<http://cost-winemo.org/>).
- RADICAL EU FP7 project on the challenges to support security and privacy in the networks for medical research networks (finished)



## Recent Relevant Publications

- P. Chini, G. Giambene, D. Bartolini, M. Luglio, C. Roseti, "Dynamic resource allocation based on a TCP-MAC cross-layer approach for DVB-RCS satellite networks", *Int. J. Satell. Commun. Network*, Vol. 24, 367-385, September-October 2006.
- G. Ciaschetti, L. Corsini, P. Detti, G. Giambene, "Packet Scheduling for UTRA-TDD", *Annals of Operational Research*, Vol. 150, pp. 93-114, 2007.
- P. Fiengo, G. Giambene, E. Trentin, "Neural-based Downlink Scheduling Algorithm for Broadband Wireless Networks", *Computer Communications journal*, Vol. 30, pp. 207-218, 2007.
- S. Kota, G. Giambene, N. L. Candio, "Cross-layer Approach for an Air Interface of GEO Satellite Communication Networks", *International Journal of Satellite Communications and Networking*, Vol. 25, pp. 481-499, September-October 2007.
- N. Celandroni, E. Ferro, G. Giambene, M. Marandola, "Satellite-3G Hybrid Networks: Impact of ACM and ARQ on TCP Performance", *Journal of Communication Software and Systems (JCOMSS)*, Vol. 3, No. 3, pp. 177-186, September 2007.
- F. Lattanzi, G. Giambene, G. Acar, B. Evans, "Admission control and handover management for high-speed trains in vehicular geostationary satellite networks with terrestrial gap-filling", *Int. J. Satellite Communications and Networking*, Vol. 28, pp. 1-27, 2010.
- P. Chini, G. Giambene, S. Kota, "A survey on mobile satellite systems", *Int. J. Satellite Communications and Networking*, Vol. 28, pp. 29-57, 2010.



## Recent Relevant Publications (cont'd)

- A. Sali, H. A. Karim, G. Acar, B. Evans, G. Giambene, "Multicast Link Adaptation in Reliable Y. F. Hu, M. Berioli, P. Pillai, H Cruickshank, G. Giambene, K. Kotsopoulos, W. Guo, P.M.L. Chan, "Broadband Satellite Multimedia", *IET Communications Journal*, Vol. 4, No. 13, pp.1519–1531, September 2010.
- S. Kota, G. Giambene, S. Kim, "Satellite component of NGN: Integrated and hybrid networks", *Int. J. Satellite Communications and Networking*, Vol. 29, pp. 191-208, May 2011.
- A. Bestetti, G. Giambene, S. Hadzic, O. Kakanou, "Performance Evaluation of a Two-Class Scheduler for WiMAX Networks", *BWA Workshop di GLOBECOM 2008*, New Orleans, December 4, 2008.
- P. Chini, G. Giambene, "Resource Management in Hybrid DVB-RCS and WiFi Networks", *Globecom 2008*, December 1-4, 2008, New Orleans.
- P. Chini, G. Giambene, S. Kota, "A Comparison Framework for MSSs", *Proc. of Globecom 2008*, December 1-4, 2008, New Orleans.
- G. Giambene, S. Marchi, S. Kota, "Cross-layer Schemes for TCP Performance Improvement in HetNets for High-Speed Trains", *to be presented at Globecom 2011*, Acceptance rate 36.6%, Houston, Texas, December 5-10, 2011.

