

Curriculum Vitae

Luciano Lenzini

SUMMARY

Luciano Lenzini received a Laurea degree in Physics in March 1969 at the University of Pisa.

From 1970 to 1994 he carried out research in networking at CNUCE, an institute of the Italian National Research Council – CNR. In 1994 he left CNUCE with the position of Research Director since he was appointed full Professor in Computer Engineering at the University of Pisa.

From 2005 to 2011 he was appointed part-time visiting professor at IMT (Institutions, Markets, Technologies – www.imtlucca.it), an Institute for Advanced Studies in Lucca, Italy. IMT is an open, competitive graduate school designed to best integrate research, education and innovation. He contributed to the organization of the school in terms of research and teaching.

His main research interests are in the areas of:

- Multi-hop Wireless Networks
- Internet: Structure, Statistical Analysis and Dynamic Evolution

Lenzini is working on the last topic since 2008 and his activity focuses on *Internet measurement systems* and *modeling the Internet Dynamic*.

TEACHING AND SEMINAR ACTIVITIES

Lenzini regularly teaches two full-year courses to the “Computer Systems Engineering” students of the University of Pisa - Faculty of Engineering, at the second (*Laurea Specialistica*) levels of degree. These courses are entitled *Performance Evaluation of Networks and Systems*, and *Advanced Network Architectures and Wireless Systems*. The first takes place in the first year and is mandatory for all students. The second takes place in the second year and is only mandatory for students who are part of the *Networking and Multimedia* program. Basically, the first is concerned with queuing systems topics, whereas the second is on cutting-edge technologies and architectures.

He also regularly gives courses for PhD students in Pisa and (until 2011) in Lucca on advanced computer networking architectures.

Lenzini has held many seminars at research establishments and foreign universities,

including: University of Twente (Netherlands), Trier and Berlin (Germany), University College London, Rutherford Laboratory (UK), Trinity College of Dublin (Ireland), INRIA (France), IBM Research Lab (Zurich), IBM Scientific Center in Heidelberg (Germany), IBM T. J. Watson Research Center – Yorktown Heights (New York).

THE MOST RELEVANT COMMITTEE MEMBERSHIPS AND CHAIRMANSHIPS

1. 1976-1978: Italian delegate, on behalf of the Ministry for Coordination of Scientific and Technological groups TAG (Technical Aspects Group) and Host Computers of the DG XIII of the European Economic Community. These groups operated within EURONET, the first European public packet switching network, which was activated in 1978.
2. 1976-1977: chairman of the COSADOC (Communications Satellite Ad Hoc Working Group), of the European Space Agency.
3. 1981-1984: Chairman of the Satellite Group, established within the European project COST 11a, which studied the relationship between the technology offered by satellites and the reference mode OSI (Open Systems Interconnection) of the ISO (OSI/RM).
4. 1982-1983: member of the board of an Italian research program in telematics and office automation at the Ministry for Coordination of Scientific and Technological Research (MURST).
5. 1984-1987: member of the Technical Consultancy Group of the ESPRIT Information Exchange System of the EEC.
6. General Chairman of the 1992 IEEE Workshop on Metropolitan Area Networks (Taormina - Italy)
7. General Chairman of the European Wireless 2002 conference (Florence - Italy)
8. Co-founder and General Chairman of the ValueTools 2006 conference (Pisa - Italy)
9. Co-chairman of the European Wireless 2010 conference (Lucca - Italy)
10. Since 2009 he is chairman of the Italian Group on Quantitative Methods in Informatics (Informatica Quantitativa - www.infq.it)

11. Chairman of the Italian GII Doctoral School 2012 (<http://gii-infq.lab.imtlucca.it/>) which was held in Lucca from June 25th to July 6th, 2012.

EDITORIAL BOARDS

Lenzini was a member of the editorial board of the following journals:

- Journal of Communications and Networks (ended in 2008)
- Wireless Networks (ended in 2010)
- Computer Networks (ended in 2012)

GUEST EDITORSHIP

1. Luciano Lenzini, John O. Limb, Willie Wu Lu, Izhak Rubin, Moshe Zukerman, *IEEE Journal on Selected Areas in Communications*, special issue entitled Analysis and Synthesis of MAC Protocols, Volume 18, Number 9, September 2000.
2. John Dunlop, Luciano Lenzini, Enzo Mingozzi, *Wireless Networks*, Volume 10, Number 1, January 2004, Selected Papers from the European Wireless 2002 Conference.
3. Luciano Lenzini, Bijan Jabbari, Bernhard Walke, *Computer Networks*, Volume 49, Issue 3, October 2005, Selected Papers from the European Wireless 2004 Conference.
4. Luciano Lenzini, Daniele Miorandi, Vaidyanathan Ramaswami, *Performance Evaluation*, Selected Papers from ValueTools 2006, Volume 65, Issues 6-7, June 2008.
5. Tijani Chahed, Luciano Lenzini, Nahum Shimkin, *Performance Evaluation*, Performance Evaluation Methodologies and Tools: Selected Papers from VALUETOOLS 2008.
6. Eitan Altman, Sajal Das, Luciano Lenzini, Adam Wolisz, *Computer Networks Journal*, Special Issue on Wireless for the Future Internet (2011).

OVERVIEW OF PROJECTS

From 1973 to 1974 Lenzini worked on computer networks at the IBM Scientific Center in Cambridge, Massachusetts, USA. During that period he gained considerable experience in the field of architecture and protocols for computer networks, which at that time were in their very initial stages. He then exploited this knowledge by directing the design and implementation of RPCNET, the first Italian

packet switching network; STELLA, the first European broadcasting satellite packet network, and OSIRIDE, the first Italian OSI compliant network. Furthermore, in the late 1970s he directed the initiative which led to the operation of the first Internet node in Italy. Details are reported below.

RPCNET

1973-1974: RPCNET was the first Italian and one of the few European projects on packet switching networks, designed and developed immediately after ARPANET was put into operation. In 1978-1982 RPCNET was tested by the Italian National Research Council (CNR) in its computing centers throughout Italy in order to evaluate the impact of a packet switching network on the CNR's processing capabilities. RPCNET helped create a culture in computer networks in Italy.

STELLA

1977-1983: Lenzini researched into MAC protocols to access the common channel provided by satellite broadcasting, and designed and directed the international project named STELLA (Satellite Transmission Experiment Linking Laboratories). STELLA was the first European satellite broadcasting packet switching network. Its goal was to interconnect Local Area Networks (installed at European research laboratories) via ESA's Orbit Test Satellite. Also involved in the project were: CERN, Rutherford Lab UK, Desy Lab, Germany, Joint Research Center - EURATOM, Italy, IAS/CNR Italy, Technical University of Graz, Austria, and Trinity College of Dublin, Ireland.

OSIRIDE

Within the ISO, Lenzini was one of the promoters of the Open Systems Interconnection (OSI), which led to the definition of OSI/RM. The OSI/RM architecture exploited many ideas deriving from his research for RPCNET and STELLA.

In 1982, he initiated OSIRIDE - a CNR project (Open Systems Interconnection Network Italian heterogeneous data), aimed at designing and activating a network of heterogeneous computers adhering to OSI/ISO international standards. OSIRIDE involved collaborations with BULL (Boston & Finix, USA), DIGITAL (Reading, UK), Hewlett-Packard (Grenoble, France), IBM (Sindelfingen, Germany) and Olivetti (Italy), Unisys (Salt Lake City, USA), TECSIEL SpA (Italy), IRI FINSIEL (Italy), and SIP (Italy).

The brand name "OSIRIDE" was patented. This project contributed significantly to the foundation of a software company in Pisa, named TECSIEL, which played a significant role in the implementation of the OSI protocols for the companies involved in the project.

The Cooperation for Open Systems International, the largest worldwide OSI organization bringing together all manufacturers of computers, included OSIRIDE in

the six most important projects worldwide.

INTERNET IN ITALY

In the late 1970s, in cooperation with Robert Kahn and Vint Cerf (the inventors of TCP/IP, Turing Awards in 2004), he directed the initiative which led to the operation of the first Internet node in Italy (the third in Europe after the Norway and the UK). Specifically, towards the end of the 70s, Bob Kahn and Vint Cerf visited CNUCE, to discuss the extension of SATNET to Italy. At that time CNUCE was about to finish the STELLA project. This meant that CNUCE had the necessary competence for collaborating with the Internet/SATNET research community. The interconnection of the Italian section of Internet with the USA, UK and Norway was done via a SATNET gateway. In the mid 1980s the node was operative and the first TCP/IP experimentation started in Italy. From that period on a fruitful TCP/IP experimentation and discussions occurred between researchers from Pisa and from the USA.

ESA SPACE DATA NETWORK

1988-1992: ESA (European Space Agency) project targeted at the design of an architecture and protocols able to use a communication system between ground stations and spacecraft, which at that time was at a design stage in Europe. The key feature of the communication system between the terrestrial receiving/transmitting stations and the spacecraft, was that they communicated using two geostationary satellites, known as Data Relay Satellites, rather than directly. This posed new problems compared to the normal networks of that era because, for example: 1) the propagation delay of the link between the ground and the spacecraft changed as the spacecraft rotated on its orbit, 2) as the spacecraft rotated around the earth it experienced a stretch of orbit in which neither of the two satellite relay data was 'visible', while the remaining stretch of the orbit it had to switch from one data relay satellite to another to communicate with earth.

MOSAICO

1998-2000: Head of the national project entitled “Methodologies and Tools, System Design for High-Performance Distributed Applications” financed by the Italian Government and involving 20 Italian universities.

EuQoS

2004-07: Head of the Italian section of an IP project of the 6th framework program of the EU named EuQoS: End-to-end Quality of Service Support Over Heterogeneous Networks. EuQoS (IST-2-004503-IP) was funded by the European Union 6th Framework Program.

NADIR

2007-2009: Head of NADIR “Design and Performance Evaluation of Distributed Algorithms and Protocols for Mesh Networks with Quality of Service”. NADIR was funded by the Italian Ministry of Education, University and Research (MIUR).

WIMAX/NOKIA

2001-2008: Worked in tight cooperation with the Nokia Research Center in Helsinki in a collaboration to: i) design scheduling algorithms for radio resource allocation both on the base station and user terminals; ii) evaluate the performance of the designed algorithms via simulation. The collaboration led to several patents.

LTE AND BEYOND/TELECOM ITALIA

Since 2006 Lenzini began working with the research laboratory of Telecom Italia located in Turin in the framework of a cooperation targeted at designing scheduling algorithms for radio resource allocation on the base station, relay nodes and user terminals. The collaboration has already led to several patents.

CONGAS

2012 (will start on October the 1st): Head of the University of Pisa Research Unit of an FET Proactive (Objective ICT-2011.9.7) project named CONGAS: *Dynamics and Coevolution in Multi Level Strategic Interaction Games*. CONGAS will last three years and is funded by the European Union 7th Framework Program.