

PERSONAL INFORMATION

Carlo Vallati

Researcher unique identifier(s): Researcher ID, J-9876-2014

Date of birth: 19/02/1983

Web Site: <http://www.iet.unipi.it/c.vallati/>

EDUCATION

PhD in Information Engineering

University of Pisa, Pisa, Italy

1 January 2009 - 24 May 2012

PhD thesis titled: “*Energy efficiency in next generation wireless networks: methodologies, solutions and algorithms*”

Master's Degree in Information Engineering

University of Pisa, Pisa, Italy

25 October 2005 - 28 February 2008

Final evaluation: 110/110 cum laude

M.S. Thesis titled: “*2^kr factorial analysis of power saving class I in IEEE802.16e*”

Bachelor's Degree in Information Engineering

University of Pisa, Pisa, Italy

1 September 2002 - 24 October 2005

Final evaluation: 110/110 cum laude

Bachelor Thesis titled: “*Realization of a driver for UHCI USB controller*”

CURRENT POSITION

Assistant Professor

04 January 2016– today

- Research in several areas, including Internet of Things, Mobile Edge/Fog Computing and wireless and sensor networks
- *Supervisor* for several bachelor's students and graduate students (both MSs and PhD)

PREVIOUS POSITIONS

Postdoctoral researcher

Department of Information Engineering, University of Pisa, Pisa, Italy

2 February 2012 – 03 January 2016

- Research in the field of Internet of Things, focusing on architectural and infrastructural aspects, smart object integration and Quality of Service support for Machine-To-Machine communications
- Involved in *the EU founded project BETaaS*, Building the Environment for the Things as a Service, 7th framework program. Implementation *task leader* for the University of Pisa.
- Research in the field of wireless mesh networks
- Involved in a *research project founded by Fluidmesh Networks (Milan, Italy)* aimed at designing and testing solutions for dynamics frequency selection mechanisms to manage efficiently frequencies co-located with Class C radar systems. *Task leader* for the implementation Work Package

Doctoral student

Department of Information Engineering, University of Pisa, Pisa, Italy

1 January 2009 - 31 December 2011

- Research in the field of wireless mesh networks
- Research in a wide range of topics related with different wireless communications technologies: power-saving mechanisms, multimedia transmission, resource allocation, solutions to improve network reliability
- Research in the field of simulation reliability and data analysis automation

Research fellow

Department of Information Engineering, University of Pisa, Pisa, Italy

1 March 2008 - 31 December 2008

- Research in the field of real time and non-real time scheduling algorithms for IEEE 802.16e networks
- Involved in a *joint project with Nokia Siemens Network*

Intern

Istituto di informatica e telematica, National Research Council - C.N.R, Pisa, Italy

13 February 2006/ 11 July 2006

- *Project developer* for Data Defender, an application for data encryption for handheld and mobile devices

VISITING EXPERIENCE

Visiting Researcher

CReWMaN Lab directed by Prof. Sajal K. Das, Computer Science Department, Missouri University of Science and Technology, Rolla, Missouri, US

01 March 2017/ 24 March 2017

- Kick off a new joint research activity on the study of 6TiSCH networks for the future industrial internet of things

Visiting Researcher

InIT Cloud Computing Laboratory, Zurich University of Applied Sciences, Zurich, Switzerland

18 August 2015/ 10 September 2015

- *Investigation* of possible joint *collaboration activities* in the framework of the future H2020 calls, work on this MSCA proposal

Visiting Student

Network Research Group directed by Prof. Prasant Mohapatra, Computer science department, UC Davis, California, USA

15 September 2010 - 15 March 2011

- Research in the field of resource management in wireless mesh networks and multimedia transmission over LTE networks
- *Responsible for maintenance and upgrade* of QuRiNet, a 36-node outdoor wireless mesh network

FELLOWSHIPS AND AWARDS

- **2013**, *Fast-track award*, Annual workshop of the Italian Group on Quantitative Methods in Informatics (Infq 2013)
- **2011**, *Fast-track award*, Annual workshop of the Italian Group on Quantitative Methods in Informatics (Infq 2011)
- **2011**, *Best paper award*, International Symposium on Wireless Personal Multimedia Communications (WPMC 2011)
- **2010**, *Travel student award*, IEEE International Conference on Mobile Ad-hoc and Sensor Systems (MASS 2010)
- **2010**, *Spotlight paper* for the June issue, IEEE Transaction on Mobile Computing
- **2009 - 2011**, *Three-year grant* issued by the Italian ministry of education and the Tuscany region for the PhD program

ORGANISATION OF SCIENTIFIC MEETINGS

- **2017**, *Co-chair* of the Six IEEE WoWMoM Workshop on the Internet of Things: Smart Objects and Services, *IoT-SoS 2017*, Macau, China
- **2013**, *Vice-chair* of the Second IEEE WoWMoM Workshop on the Internet of Things: Smart Objects and Services, *IoT-SoS 2013*, Madrid, Spain
- **2011**, *Web Chair* for the 12th IEEE International Symposium on a World of Wireless, Mobile and Multimedia Networks, *WoWMoM 2011*, Lucca, Italy
- **2009**, *Local Organization Co-Chair* (with Dr. Daniele Migliorini) for the Fourth International Conference on Performance Evaluation Methodologies and Tools, *Valuetools 2009*, Pisa, Italy
- **2018**, *TPC member*, IEEE International Conference on Smart Computing, SMARTCOMP 2018, Taormina, Italy
- **2018**, *TPC member*, IEEE International Conference on Distributed Computing Systems, ICDCS 2018, Vienna, Austria
- **2018**, *TPC member*, International Symposium on a World of Wireless Mobile and Multimedia Networks, WoWMoM 2018, Chania, Greece
- **2018**, *TPC member*, The Second International Workshop on Pervasive Smart Living Spaces (PerCom), PerLS 2018, Athens, Greece
- **2018**, *TPC member*, International Conference on Embedded Wireless Systems and Networks, EWSN 2018, Madrid, Spain
- **2018**, *TPC member*, International Conference on Computing, Networking and Communications, ICNC 2018, Hawaii, USA
- **2017**, *TPC member*, International Symposium on a World of Wireless Mobile and Multimedia Networks, WoWMoM 2017, Macau, China
- **2017**, *TPC member*, Fifth International Conference on Advances in Computing, Communications and

- Informatics, ICACCI 2017, Karnataka, India
- **2017**, *TPC member*, The Seventh International Conference on Mobile Services, Resources, and Users, MOBILITY17, Venice, Italy
- **2017**, *TPC member*, The Eighth International Conference on Cloud Computing, GRIDs, and Virtualization, CLOUD COMPUTING 2017, Athens, Greece
- **2017**, *TPC member*, International Conference on Computer Applications & Technology, ICCAT 2017, Cairo, Egypt
- **2017**, *TPC member*, International Conference on Computing, Networking and Communications, ICNC 2017, Silicon Valley, USA
- **2016**, *TPC member*, Fifth International Conference on Advances in Computing, Communications and Informatics, ICACCI 2016, Jaipur, India
- **2016**, *TPC member*, World Symposium on Computer Applications and Research, GC-WOC 2016, Malaga, Spain
- **2016**, *TPC member*, International Conference on Computer Communication and Networks, ICCCN 2016, Waikoloa, Hawaii USA
- **2016**, *TPC member*, Global Summit on Computer and Information Technology, GSCIT 2016, Sousse, Tunisia
- **2016**, *TPC member*, International Conference on Future Network System and Security, FNSS 2016, Paris, France
- **2016**, *TPC member*, The Seventh International Conference on Cloud Computing, GRIDs, and Virtualization, CLOUD COMPUTING 2016, Rome, Italy
- **2016**, *TPC member*, International Conference on Computer Communication and Networks, ICCCN 2016, Waikoloa, Hawaii USA
- **2015**, *TPC member*, Forth International Conference on Advances in Computing, Communications and Informatics, ICACCI 2015, Kerala, India
- **2015**, *TPC Member*, Second International Symposium on Computer Vision and the Internet, VisioNet 2015, co-located with ICACCI 2015, Kerala, India
- **2015**, *TPC member*, Fourth International Conference on Advances in Vehicular Systems, Technologies and Applications, Vehicular 2015, St. Julians, Malta
- **2015**, *TPC member*, International Conference on Computer Applications & Technology, ICCAT 2015, Rome, Italy
- **2015**, *TPC member*, World Symposium on Computer Applications and Research, WSCAR 2015, Rome, Italy
- **2014**, *TPC member*, The Third International Conference on Advances in Vehicular Systems, Technologies and Applications, Vehicular 2014, Seville, Spain
- **2014**, *TPC member*, The Third International Conference on Advances in Computing, Communications and Informatics, ICACCI 2014, Greater Noida, India
- **2014**, *TPC Member*, The First International Symposium on Computer Vision and the Internet, VisioNet 2014, co-located with ICACCI 2014, Greater Noida, India
- **2013**, *TPC member* of the 5th International Workshop on Hot Topics in Mesh Networking, IEEE HotMesh 2013, Madrid, Spain
- **2013**, *TPC member*, The Second International Conference on Advances in Vehicular Systems, Technologies and Applications, Vehicular 2013, Nice, France
- **2012**, *TPC member*, The First International Conference on Advances in Vehicular Systems, Technologies and Applications, Vehicular 2012, Venice, Italy

EDITORIAL BOARDS

- **2017-today**, *Applied Sciences*, MDPI

REFREE ACTIVITY

- **Reviewer** for the following journals: IEEE/ACM Transactions on Networking, IEEE Transactions on Mobile Computing, IEEE Internet of Things Journal, Pervasive and Mobile Computing, Computer Communications, Computer Networks (Elsevier), IEEE Wireless Communications Letters, Simulation Modelling Practice and Theory, Ad Hoc Networks, Journal of Engineering
- **Reviewer** for the following conferences: SMARTCOMP 2017, WF-IoT 2016, MSWiM'16, GC 2016, INFOCOM 2016, WF-IoT 2015, GC' 15 - Wireless Networks, MSWiM'15, EW2015, ICC'15 (01) SAC 4-IoT, IEEE WoWMoM 2015, IEEE SPICES 2015, MSWiM'14, ICSPCT 2014, IEEE WoWMoM 2014, INFOCOM'2014, WF-IoT 2014, GC13, MSWiM'13, SustainIT 2013, PIMRC'13, IEEE WoWMoM 2013, IEEE HotMESH 2013, INFOCOM'2013, GC12, IEEE WoWMoM 2012, ICC'12, INFOCOM'2012, GC'11, BWA 2010, GC10, ISDA 2010, PIMRC 2010, EW2010, WD'09, GC'09, PIMRC'09, HotMESH 2009, EW09

MEMBERSHIPS OF SCIENTIFIC SOCIETIES

- 2009 - 2012, *IEEE Member*
- 2009 - today, Member of the *Italian Group on Quantitative Methods in Informatics*, Infq

PROJECTS

- 2017 - 2018, *Experimental assessment of congestion control strategies for the Constrained Application Protocol (CoAP)*, **Principal Investigator**, funded by European Project WiSHFUL under the 5th Open Call for experiments
- 2011 - 2015, *Secondlife - Second Life of the Public Services*, funded by the Italian ministry for economic development
- 2012 - 2015, *BETaaS, Building the Environment for the Things as a Service*, FP7-ICT-2011-8 n. 317674. Funded by the European Union within the 7th Framework Program
- 2010-2011, Development of a protocol for Dynamic Frequency Selection in wireless mesh networks. Funded by Fluidmesh Networks (Milan, Italy)
- 2008, Performance Evaluation of IEEE 802.16e. Funded by Nokia Research Centre (Helsinki, Finland)

MAJOR COLLABORATIONS

- 2017 - today, *Computer Science Department*, Missouri University of Science and Technology, Rolla, Missouri, US, CReWMaN Lab directed by Prof. Sajal K. Das, study of the performance of 6TiSCH networks for industrial wireless sensor networks
- 2013 - today, *Istituto di informatica e telematica, C.N.R*, Pisa, Italy, study of the performance of the RPL protocol in low-power and lossy networks
- 2010 - 2012, *UC Davis, Computer Science Department*, Davis, USA, Network Research Group directed by Prof. Prasant Mohapatra, study of the channel allocation problem in wireless mesh networks, management and upgrade of QuRiNet, a 36-node outdoor wireless mesh network
- 2010 - 2011, *University College Dublin*, Performance Engineering Laboratory, Dublin, Ireland, study of multimedia transmission over LTE

INVITED TALKS

- **C. Vallati**. "The 6TiSCH architecture for industrial wireless IP-based networks: overview and open research issues", March 13, Missouri University of Science and Technology, Rolla, Missouri, USA.
- **C. Vallati**. "QoS support in the BETaaS platform", BETaaS workshop, 11 May 2014, Aalborg, Denmark.
- G. Stea, **C. Vallati**. "Resource allocation in LTE", 2 April 2012, University of Pisa, Pisa, Italy.
- **C. Vallati**. "LTE, tutorial and research prospective", 4 March 2011, Dept. of Computer Science, UC Davis, CA, USA.
- **C. Vallati**. "Channel assignment in wireless mesh networks", 12 December 2010, Dept. of Computer Science, UC Davis, CA, USA.

RELEVANT PUBLICATIONS

A full list of publications is available on: <http://www.iet.unipi.it/c.vallati/publications.shtml>

Book chapter:

- G. Tanganelli, **C. Vallati**, E. Mingozzi, "Ensuring Quality of Service in the Internet of Things" in *New Advances in the Internet of Things* (eds Yager, Ronald R., Pascual Espada, Jordán), 2017, Springer International Publishing, New York, USA. Print ISBN: 978-3-319-58189-7, Online ISBN: 978-3-319-58190-3
- **C. Vallati**, V. Omwando, P. Mohapatra, "The experimental work vs. simulation in the study of mobile ad hoc networks" in *Mobile Ad Hoc Networking: Cutting Edge Directions, Second Edition* (eds S. Basagni, M. Conti, S. Giordano, I. Stojmenovic), 2013, John Wiley & Sons, Inc., Hoboken, NJ, USA. Print ISBN: 9781118087282, Online ISBN: 9781118511305.

Journals:

- G. Tanganelli, **C. Vallati**, E. Mingozzi, Edge-centric Distributed Discovery and Access in the Internet of Things *IEEE Internet of Things Journal*, Accepted, In Press.
- **C. Vallati**, S. Brienza, M. Palmieri, G. Anastasi, Improving network formation in IEEE 802.15.4e DSME, In *Computer Communications*, Volume 114, 2017, Pages 1-9
- E. Ancillotti, **C. Vallati**, R. Bruno, E. Mingozzi, A Reinforcement Learning-based Link Quality Estimation Strategy for RPL and its Impact on Topology Management, *Computer Communications*, Vol. 112, pp. 1-13, November 2017
- P. Perazzo, **C. Vallati**, G. Anastasi, G. Dini, "DIO Suppression Attack Against Routing in the Internet of Things," in *IEEE Communications Letters*, vol. PP, no. 99, pp. 1-1

- **C. Vallati**, A. Viridis, E. Mingozzi, G. Stea, "MEC come home! Connecting things in future smart homes using LTE D2D communications", *IEEE Consumer Electronics Magazine*, Vol. 5, No. 4, pp. 77-83, October 2016.
- **C. Vallati**, E. Mingozzi, C. Benedetto, Efficient Handoff Based on Link Quality Prediction for Video Streaming in Urban Transport Systems, *Wireless Communications and Mobile Computing*, 2016, to appear.
- **C. Vallati**, E. Mingozzi, G. Tanganelli, N. Buonaccorsi, N. Valdambri, N. Zonidis, B. Martínez, A. Mamelli, D. Sommacampagna, B. Anggorojati, S. Kyriazakos, N. Prasad, F. Nieto De-Santos, O. Barreto Rodriguez, "BETaaS: A Platform for Development and Execution of Machine-to-Machine Applications in the Internet of Things", *Wireless Personal Communications*, May 2015. ISSN 1572-834X.
- **C. Vallati**, E. Mingozzi, "Efficient Design of Wireless Mesh Networks with Robust Dynamic Frequency Selection Capability", *Computer Networks*, Vol. 83, pp. 15–29, June 2015. ISSN 1389-1286.
- B. Anggorojati, S. Kyriazakos, N. Prasad, **C. Vallati**, E. Mingozzi, G. Tanganelli, N. Buonaccorsi, B. Martínez, F. Nieto De-Santos, N. Zonidis, G. Labropoulous, A. Mamelli, D. Sommacampagna, "BETaaS platform – a Things as a Service Environment for future M2M marketplaces", *EAI Endorsed Transactions on Cloud Systems*, Vol. 1, Num. 1, pp. 1-9, February 2015. ISSN 2410-6895.
- E. Mingozzi, G. Tanganelli, **C. Vallati**, "A framework for QoS Support in Things-as-a-Service oriented architectures", *Journal of Communication, Navigation, Sensing and Services (CONASENSE)*, Vol. 1, Num. 2, pp. 105-128, August 2014. ISSN 2246-2139.
- L. Bisti, L. Lenzini, E. Mingozzi, **C. Vallati**, A. Erta, U. Malesci, "Improved Network Resilience of Wireless Mesh Networks Using MPLS and Fast Re-Routing Techniques". *Ad Hoc Networks*, Vol. 9, Num. 8, pp. 1448-1460, November 2011. ISSN 1570-8705.
- D. Migliorini, E. Mingozzi, **C. Vallati**, "Performance evaluation of H.264/SVC video streaming over mobile WiMAX". *Computer Networks*, Vol. 55, Num. 15, pp. 3578 – 3591, October, 2011. ISSN 1389-1286.
- C. Cicconetti, L. Lenzini, E. Mingozzi, **C. Vallati**, "Reducing Power Consumption with QoS Constraints in IEEE 802.16e Wireless Networks". *IEEE Transactions on Mobile Computing*, Vol. 9, Num. 7, pp. 1008-1021, July 2010. ISSN 1536-1233.

Conferences and workshops:

- S. Bolettieri, **C. Vallati**, G. Tanganelli, E. Mingozzi, Highlighting Some Shortcomings of the CoCoA+ Congestion Control Algorithm, *Proceedings of the 16th International Conference on Ad Hoc Networks and Wireless (ADHOC-NOW 2017)*, Messina, Italy, September 20-22, 2017.
- P. Perazzo, **C. Vallati**, G. Anastasi, G. Dini, An Implementation and Evaluation of the Security Features of RPL, *Proceedings of the 16th International Conference on Ad Hoc Networks and Wireless (ADHOC-NOW 2017)*, Messina, Italy, September 20-22, 2017.
- G. Tanganelli, **C. Vallati**, E. Mingozzi, "A Fog-based Distributed Look-up Service for Intelligent Transportation Systems", *Proceedings of the 4th IEEE International Workshop on Smart Vehicles - co-located with IEEE WoWMoM 2017*, Macau, P.R. China, June 12, 2017.
- F. Righetti, **C. Vallati**, G. Anastasi and S. Das, "Performance Evaluation the 6top Protocol and Analysis of its Interplay with Routing," *2017 IEEE International Conference on Smart Computing (SMARTCOMP)*, Hong Kong, China, 2017, pp. 1-6.
- D. Costa, E. Mingozzi, G. Tanganelli, **C. Vallati**, "An AllJoyn to CoAP Bridge". *Proceedings of the IEEE 3rd World Forum on Internet of Things (IEEE WF-IoT 2016)*, Reston (VA), USA, December 12-14, 2016.
- G. Tanganelli, E. Mingozzi, **C. Vallati**, M. Kovatsch, "Efficient Proxying of CoAP Observe with Quality of Service Support". *Proceedings of the IEEE 3rd World Forum on Internet of Things (IEEE WF-IoT 2016)*, Reston (VA), USA, December 12-14, 2016.
- **C. Vallati**, E. Ancillotti, R. Bruno, E. Mingozzi, G. Anastasi, Interplay of Link Quality Estimation and RPL performance: an Experimental Study, *Proceedings of the 13th ACM International Symposium on Performance Evaluation of Wireless Ad Hoc, Sensor, and Ubiquitous Networks (ACM PE-WASUN 2016) - co-located with ACM MSWiM 2016*, Valletta, Malta, November 13-17, 2016.
- E. Mingozzi, G. Tanganelli, **C. Vallati**, B. Martínez, I. Mendia, M. Gonzalez-Rodriguez, Semantic-based Context Modeling for Quality of Service Support in IoT Platforms, *Proceedings of the IEEE the 5th Workshop on the Internet of Things: Smart Objects and Services (IEEE IoT-SoS 2016) - co-located with IEEE WoWMoM 2016*, Coimbra, Portugal, June 21, 2016.
- **C. Vallati**, A. Viridis, E. Mingozzi, G. Stea, "Exploiting LTE D2D Communications in M2M Fog Platforms: Deployment and Practical Issues", *Proceedings of the IEEE 2nd World Forum on Internet of Things (IEEE WF-IoT 2015)*, Milan, Italy, December 14-16, 2015.
- G. Tanganelli, **C. Vallati**, E. Mingozzi, "CoAPthon: Easy Development of CoAP-based IoT Applications with Python", *Proceedings of the IEEE 2nd World Forum on Internet of Things (IEEE WF-IoT 2015)*, Milan, Italy, December 14-16, 2015.
- E. Mingozzi, G. Tanganelli, **C. Vallati**, "CoAP Proxy Virtualization for the Web of Things". *Proceedings of the 6th IEEE International Conference on Cloud Computing Technologies and Science (IEEE CloudCom*

2014), Singapore, 15-18 December 2014.

- G. Tanganelli, **C. Vallati**, E. Mingozzi, “Energy-Efficient QoS-aware Service Allocation for the Cloud of Things”. Proceedings of the IEEE Workshop on Emerging Issues in Cloud (EIC 2014) - co-located with IEEE CloudCom 2014, Singapore, 15-18 December 2014.
- B. Anggorojati, S. Kyriazakos, N. Prasad, **C. Vallati**, E. Mingozzi, G. Tanganelli, N. Buonaccorsi, B. Martínez, F. Nieto De-Santos, N. Zonidis, G. Labropoulous, A. Mamelli, D. Sommacampagna, “BETaaS Platform – A Things as a Service Environment for Future M2M Marketplaces”, First International Summit, IoT360 2014, Rome, Italy, 27-28 October 2014.
- E. Ancillotti, R. Bruno, M. Conti, E. Mingozzi, **C. Vallati**, “Trickle-L²: lightweight link quality estimation through Trickle in RPL networks”, Proceedings of the 15th International Symposium on a World of Wireless Mobile and Multimedia Networks (WoWMoM 2014), Sydney, Australia, 16-19 June 2014.
- E. Mingozzi, G. Tanganelli, **C. Vallati**, “A framework for QoS Negotiation in Things-as-a-Service oriented Wireless Communications”. Proceedings of the 4th International Conference on Wireless Communications, Vehicular Technology, Information Theory and Aerospace & Electronic Systems (Wireless VITAE 2014), Aalborg, Denmark, 11-14 Maggio 2014.
- **C. Vallati**, E. Mingozzi, “Trickle-F: fair broadcast suppression to improve energy-efficient route formation with the RPL routing protocol”, Proceedings of the 3rd IFIP Conference on Sustainable Internet and ICT for Sustainability (SustainIT 2013), Palermo, Italy, 30-31 October 2013.
- E. Mingozzi, G. Tanganelli, **C. Vallati**, V. Di Gregorio, “An Open Framework for Accessing Things as a Service”, Proceedings of the 16th International Symposium on Wireless Personal Multimedia Communications (WPMC 2013), Atlantic City, NJ, USA, 24-27 June 2013.
- P Mcdonagh, **C. Vallati**, A Pande, P. Mohapatra, P A Perry, E Mingozzi, “Investigation of Scalable Video Delivery using H.264 SVC on an LTE Network”. Proceedings of 14th Symposium on Wireless Personal Multimedia Communications (WPMC 2011), Brest, France, 3-7 October 2011
- C. Cicconetti, L. Lenzini, D. Migliorini, E. Mingozzi, **C. Vallati**, “Design and Performance Evaluation of an Energy-Aware Scheduling Framework for Mobile WiMAX”. Proceedings of the 13th ACM Symposium on Modeling, Analysis and Simulation of Wireless and Mobile Systems (MSWiM'10), Bodrum, Turkey, 17-21 October 2010.

November 7, 2017