CURRICULUM VITAE

of

Davide Quaglia

(last update January 2018)

1. Life information

Birth: Canelli (AT) - Italy, October 30, 1974.

Nationality: Italy

2. Current position

Davide Quaglia is assistant professor (ricercatore confermato a tempo pieno) at Department of Computer Science of University of Verona, Verona, Italy.

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3. Short introduction

Davide Quaglia received his PhD in Computer Engineering from Politecnico di Torino (Italy) in 2003. Currently he is Assistant Professor at the Computer Science Department of the University of Verona (Italy) where he currently teaches ``Design of Networked Embedded Systems". He is author/co-author of about 70 papers and member of IEEE. He is TPC member of ACM/IEEE DATE and Euromicro DSD. His current research interests include Networked Embedded Systems, Networked Control Systems, Cyber-Physical Systems. He was also co-founder and collaborator of EDALab s.r.l., a spin-off company of the University of Verona.

4. Education

From November 2002 to December 2004 Davide Quaglia was research assistant at the Center for Multimedia Radio Communications (CERCOM) of the “Politecnico di Torino”.

In March 2003 he got the Ph.D in Computer Engineering with a thesis on “Coding and Robust Delivery of Video over Packet Networks” (supervisors: prof. Angelo R. Meo and dr. Juan C. De Martin).

On December 15, 1999 he got the laurea degree (summa cum laude) in Computer Engineering at the “Politecnico di Torino” with a thesis on “Codificatore parallelo MPEG video ad alta qualità su cluster di processori” (supervisor: prof. Angelo Raffaele Meo). The thesis was supported by an annual research grant.

5. Foreign languages

Good knowledge of English.

Basic knowledge of French.

6. Scientific activities

6.1 Research topics and background knowledge

My research addresses the design of a distributed embedded application as a whole system. In particular, I am working on specification, modeling, design exploration, simulation, synthesis with particular emphasis on the role of the network in the distributed system. I am working both on theoretical aspects and tools. Regarding applications of this research, I am focusing on networked control systems and wireless sensor networks.

Current research topics are:

- networked embedded systems
- networked control systems
- wireless sensor networks
- pervasive computing
- precision agriculture

Background knowledge:

- Operating systems
- Computer architectures and system modeling in SystemC
- Programming languages

- Network architectures and protocols, e.g., Ethernet/802.3, IEEE 802.11, IEEE 802.15.4, ZigBee, TCP/IP, IPv6, RTP, RTSP, H.323, SIP.
- Internet applications: transmission of voice/audio/video over IP, streaming techniques, videoconference, Java 2 Enterprise Edition, PHP, Internet services (Telnet, FTP, HTTP, SMTP, POP3).
- Main audio/video compression algorithms and coding formats.
- Simulation environments, e.g., NS-2, SystemC, TOSSIM, MATLAB.
- Misc.: database design, business applications, web-based applications.

6.2 Publications

Refereed international journals

M. Lora, S. Vinco, E. Fraccaroli, D. Quaglia, F. Fummi, Analog Models Manipulation for Effective Integration in Smart System Virtual Platforms, IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems, vol. PP, n. 99, May 2017, pp. 1-1, DOI 10.1109/TCAD.2017.2705129.

K. Grüttner, R. Görgen, S. Schreiner, F. Herrera, P. Peñil, J. Medina, E. Villar, G. Palermo, W. Fornaciari, C. Brandolese, D. Gadioli, E. Vitali, D. Zoni, S. Bocchio, L. Ceva, P. Azzoni, M. Poncino, S. Vinco, E. Macii, S. Cusenza, J. Favaro, R. Valencia, I. Sander, K. Rosvall, N. Khalilzad, D. Quaglia, CONTREX: Design of embedded mixed-criticality CONTRol systems under consideration of EXtra-functional properties, Microprocessors and Microsystems, Vol. 51, June 2017, pp. 39-55, DOI 10.1016/j.micpro.2017.03.012.

R. Muradore, D. Quaglia, Communication-Aware Bandwidth-Optimized Predictive Control of Motor Drives in Electric Vehicles, IEEE Transactions on Industrial Electronics, vol. 63, n. 9, September 2016, pp. 5602-5611, DOI 10.1109/TIE.2016.2558485.

Riccardo Muradore, Davide Quaglia, Energy-Efficient Intrusion Detection and Mitigation for Networked Control Systems Security, IEEE Transactions on Industrial Informatics, vol. 11, n. 3, June 2015, pp. 830-840, DOI 10.1109/TII.2015.2425142.

Emad Ebeid, Franco Fummi, and Davide Quaglia, Model-Driven Design of Network Aspects of Distributed Embedded Systems, IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems, vol. 34, n. 4, April 2015, pp. 603-614, DOI 10.1109/TCAD.2015.2394395.

Emad Ebeid, Franco Fummi, Davide Quaglia, HDL Code Generation from UML/MARTE Sequence Diagrams for Verification and Synthesis, Design Automation for Embedded Systems, vol. 19, n. 3, pp. 277-299, 2015, Springer, DOI 10.1007/s10617-014-9158-1.

Parinaz Sayyah, Mihai T. Lazarescu, Sara Bocchio, Emad Ebeid, Gianluca Palermo, Davide Quaglia, Alberto Rosti, Luciano Lavagno, Virtual Platform-based Design Space Exploration of

Power-Efficient Distributed Embedded Applications, ACM Transactions on Embedded Computing Systems, vol. 14, n. 3, April 2015, pp. 49:1-49:25, DOI 10.1145/2723161.

R. Muradore, L. Repele, D. Quaglia, P. Fiorini, Improving Performance of Networked Control Systems by using Adaptive Buffering, IEEE Transactions on Industrial Electronics, vol. 61, n. 9, September 2014, pp. 4847-4856.

K. Grüttner, P. A. Hartmann, K. Hylla, S. Rosinger, W. Nebel, F. Herrera, E. Villar, C. Brandolese, W. Fornaciari, G. Palermo,C. Ykman-Couvreur, D. Quaglia, F. Ferrero, R. Valencia, The COMPLEX reference framework for HW/SW co-design and power management supporting platform-based design-space exploration. Microprocessors and Microsystems, vol. 37, n. 8, Part C, 2013, pp. 966-980.

D. Quaglia, R. Muradore, R. Bragantini, P. Fiorini, A SystemC/Matlab co-simulation tool for networked control systems. Simulation Modeling Practice and Theory, Elsevier, April 2012, vol. 23, p. 71-86.

N. Bombieri, F. Fummi, D. Quaglia, System/Network Design Space Exploration based on TLM for Networked Embedded Systems, ACM Transactions on Embedded Computing Systems (TECS), March 2010, vol. 9, no. 4.

E. Masala, D. Quaglia, J. C. De Martin, "Variable Time Scale Multimedia Streaming Over IP Networks", IEEE Transactions on Multimedia, December 2008, vol. 10, no. 8, pp. 1657-1670.

B. Montrucchio, D. Quaglia, "New Sorting-Based Lossless Motion Estimation Algorithms and a Partial Distortion Elimination Performance Analysis", IEEE Transactions on Circuits and Systems for Video Technology, vol. 15, no. 2, pp. 210-220, February 2005.

Book chapters

F. Stefanni, D. Quaglia, F. Fummi, SystemC Simulation of Networked Embedded Systems, chapter in Languages for Embedded Systems and their Applications, Springer Lecture Notes in Electrical Engineering, vol. 36, pp. 201-211, 2009.

Tutorials and invited talks

D. Quaglia, M. Poncino, M. Magno, Is Energy Wearable?, Tutorial at IEEE/ACM Design, Automation & Test in Europe Conference & Exhibition (DATE), Lausanne (Switzerland), 27 March 2017.

D. Quaglia, K. Gruettner, Virtual Platforms in the Internet-of-Things Era – State of the Art and New Perspectives, Tutorial at IEEE/ACM Design, Automation & Test in Europe Conference & Exhibition (DATE), Dresden (Germany), 14 March 2016.

D. Quaglia, K. Gruettner, Virtual Integration Testing for Mixed-Criticality Systems under Consideration of Power and Temperature Constraints – A highly integrated Avionics and Payload Computing Use-Case, Tutorial at HIPEAC, Prague (Czech Republic), 18 January 2016.

D. Quaglia, M. Lukasiewycz, R. Muradore, S. Steinhorst, Let's kick start electric vehicles!, Tutorial at IEEE/ACM Design, Automation & Test in Europe Conference & Exhibition (DATE), Grenoble (France), 9 March 2015.

D. Quaglia, M. Poncino, A. Pegatoquet, The power of Power in future wireless smart systems for the Internet of Things, Tutorial at IEEE/ACM Design, Automation & Test in Europe Conference & Exhibition (DATE), Grenoble (France), 9 March 2015

D. Quaglia, D. Drogoudis, D. Bresolin, A Cyber-Physical Approach to Modeling, Simulation and Verification of Smart Systems, Tutorial at IEEE/ACM Design, Automation & Test in Europe Conference & Exhibition (DATE), Dresden (Germany), 24 March 2014

Cyber-physical systems: Modeling, simulation, design and validation, Tutorial at the 2nd Mediterranean Conference on Embedded Computing (MECO), 15-20 June 2013 , doi: 10.1109/MECO.2013.6601389

Communications in Cyber-Physical Systems, Invited talk at the 2nd Mediterranean Conference on Embedded Computing (MECO), 15-20 June 2013 , doi: 10.1109/MECO.2013.6601382

Refereed international conferences

G. Liboni, J. Deantoni, A. Portaluri, D. Quaglia and R. De Simone, Beyond Time-Triggered Co-simulation of Cyber-Physical Systems for Performance and Accuracy Improvements, in Proc. of ACM 10th Workshop on Rapid Simulation and Performance Evaluation: Methods and Tools (RAPIDO), Manchester, United Kingdom, January 22-24, 2018.

M. Lora, S. Centomo, D. Quaglia and F. Fummi, Automatic Integration of Cycle-accurate Descriptions with Continuous-time Models for Cyber-Physical Virtual Platforms, Design, Automation & Test in Europe Conference & Exhibition (DATE), Dresden, 2018.

G. Miorandi, F. Stefanni, F. Fraccaroli and D. Quaglia, A SystemC-based Simulator for Design Space Exploration of Smart Wireless Systems, Design, Automation & Test in Europe Conference & Exhibition (DATE), Dresden, 2018.

A. Castellini, A. Farinelli, G. Minuto, D. Quaglia, I. Secco and F. Tinivella, EXPO-AGRI: Smart Automatic Greenhouse Control, in Proc. of IEEE FoodCAS 2017 Electronics for Better Quality of Food, in IEEE Biomedical Circuits and Systems Conference (BioCAS), Torino, Italy, October 19-21, 2017.

E. Ebeid, R. H. Jacobsen, F. Stefanni, D. Quaglia, Scalable open source smart grid simulator

(SGSim), in Proc. of IEEE Power Energy Society Innovative Smart Grid Technologies Conference (ISGT), Washington, DC, USA April 23-26, 2017.

G. Miorandi, F. Fraccaroli, E. Giordano, M. Magno, W. Vendraminetto and D. Quaglia, Demo Abstract: A Low-Complexity Eyewear System for Direction-based Augmented Reality Applications, in Proc. of ACM Conference on Embedded Networked Sensor Systems (SenSys), Delft, The Netherlands, November 5-8, 2017.

E. Fraccaroli, M. Lora, S. Vinco, D. Quaglia and F. Fummi, Integration of mixed-signal components into virtual platforms for holistic simulation of smart systems, Design, Automation & Test in Europe Conference & Exhibition (DATE), Dresden, 2016, pp. 1586-1591.

E. Ebeid, F. Fummi, D. Quaglia, H. Posadash, E. Villar, A Framework for Design Space Exploration and Performance Analysis of Networked Embedded Systems, 6th ACM Workshop on Rapid Simulation and Performance Evaluation: Methods and Tools, Vienna, Austria, 20-22 January, 2014, pp. 1-8.

E. Ebeid, F. Fummi, D. Quaglia, Communication Alternatives Exploration in Model-Driven Design of Networked Embedded Systems, IEEE International Workshop on Microprocessor Test and Verification (MTV), Austin, TX, USA, 11–13 December, 2013, pp. 100-105.

E. Ebeid, F. Fummi, D. Quaglia, F. Stefanni, Automatic Network Protocol Synthesis from UML Sequence Diagrams, IEEE International Workshop on Microprocessor Test and Verification (MTV), Austin, TX, December 11-13, 2013, pp. 1-6.

G. Botturi, D. Quaglia, E. Ebeid, F. Fummi, Model-Driven Design for the Development of Multi-Platform Smartphone Applications, Forum on Specification & Design Languages (FDL), Paris, France, 2013, IEEE.

E. Ebeid, F. Fummi, D. Quaglia, UML-based Modeling and Simulation of Environmental Effects in Networked Embedded Systems, 16th Euromicro Conference on Digital System Design (DSD), Santander (Spain), 4-6 Sept. 2013, IEEE

G. Lorenzi, D. Quaglia, R. Muradore, P. Fiorini, Passivity-Based Control over Differentiated-Services Packet Networks, 16th Euromicro Conference on Digital System Design (DSD), Santander (Spain), 4-6 Sept. 2013, IEEE

M. Crepaldi, P. Motto Ros, D. Demarchi, J. Buckley, B. O'Flynn, D. Quaglia, A Physical-Aware Abstraction Flow for Efficient Design-Space Exploration of a Wireless Body Area Network Application, 16th Euromicro Conference on Digital System Design (DSD), Santander (Spain), 4-6 Sept. 2013, IEEE

E. Ebeid, F. Fummi, D. Quaglia, A Toolchain for UML-based Modeling and Simulation of Networked Embedded Systems, 15th International Conference on Computer Modelling and Simulation (UKSim), Emmanuel College, Cambridge, UK, April 10-12, 2013, IEEE, pp. 374-379

R. Muradore, D. Quaglia, P. Fiorini, Model predictive control over delay-based differentiated services control networks, IEEE/ACM Design, Automation & Test in Europe Conference &

Exhibition (DATE), Grenoble (France), 18-22 March 2013, 2013, IEEE, pp. 1117-1122

M. Lazarescu, P. Sayyah, D. Quaglia, F. Stefanni, SystemC Model Generation for Realistic Simulation of Networked Embedded Systems, 15th Euromicro Conference on Digital System Design (DSD), Cesme/Izmir (Turkey), 5-8 Sept. 2012, IEEE, pp. 423-426

E. Ebeid, F. Fummi, D. Quaglia, F. Stefanni, Refinement of UML/MARTE models for the design of networked embedded systems, IEEE/ACM Design, Automation & Test in Europe Conference & Exhibition (DATE), Dresden, Germany, March 12-16, 2012, IEEE, pp. 1072-1077

R. Muradore, D. Quaglia, P. Fiorini, Predictive Control of Networked Control Systems over Differentiated Services Lossy Networks, IEEE/ACM Design, Automation & Test in Europe Conference & Exhibition (DATE), Dresden (Germany), 12-16 March 2012, IEEE, pp. 1245-1250

E. Ebeid, D. Quaglia, M. Lazarescu, P. Sayyah, S. Bocchio, A. Rosti, Network-aware Design-Space Exploration of a Power-Efficient Embedded Application, IEEE/ACM/IFIP international conference on Hardware/software codesign and system synthesis (CODES+ISSS), Tampere, Finland, October 7-12, 2012, IEEE/ACM/IFIP, pp. 567-574

E. Ebeid, F. Fummi, D. Quaglia, Generation of VHDL code from UML/MARTE sequence diagrams for verification and synthesis, 15th Euromicro Conference on Digital System Design (DSD), Cesme-Izmir (Turkey), Sept. 5-8, 2012, IEEE, pp. 708-714

E. Ebeid, D. Quaglia, F. Fummi, Generation of SystemC/TLM code from UML/MARTE sequence diagrams for verification, 15th IEEE Symposium on Design and Diagnostics of Electronic Circuits and Systems (DDECS), Tallinn, Estonia , April 18-20, 2012, IEEE, pp. 187-190

K. Gruttner, P.A. Hartmann, K. Hylla, S. Rosinger, W. Nebel, F. Herrera, E. Villar, C. Brandolese, W. Fornaciari, G. Palermo, C. Ykman-Couvreur, D. Quaglia, F. Ferrero, R. Valencia, COMPLEX: COdesign and Power Management in PLatform-Based Design Space EXploration, 15th Euromicro Conference on Digital System Design (DSD), Cesme/Izmir (Turkey), 5-8 Sept. 2012, IEEE, pp. 349-358

F. Fummi, D. Quaglia, F. Stefanni, Communication-aware middleware-based design-space exploration for networked embedded systems, IEEE/IFIP 19th International Conference on VLSI and System-on-Chip (VLSI-SoC), pp. 168-171, Hong Kong, China, 3-5 Oct. 2011.

N. Bombieri, F. Fummi, D. Quaglia, S. Vinco, Automatic interface generation for component reuse in HW-SW partitioning, IEEE EUROMICRO Conference on Digital System Design (DSD), pp. 793-796, Oulu, Finland, 31 Aug. - 2 Sept. 2011.

R. Muradore, D. Quaglia, P. Fiorini, Adaptive LQ Control over Differentiated Service Lossy Networks, 18th IFAC World Congress, Milan, Italy, 28 Aug. - 2 Sept., 2011.

D. Quaglia, R. Muradore, P. Fiorini, Plant control over QoS-enabled packet networks, IEEE International Symposium on Industrial Embedded Systems (SIES), pp. 132-139, Vasteras, Sweden, 15-17 June 2011.

F. Fummi, D. Quaglia, F. Stefanni, Communication-Aware Design Flow for Dependable

Networked Embedded Systems, IEEE International Symposium on Circuits and Systems (ISCAS), pp. 2861-2864, Rio De Janeiro, Brazil, 15-18 May 2011.

F. Fummi, G. Lovato, D. Quaglia, F. Stefanni, Modeling of Communication Infrastructure for Design-Space Exploration, ECSI Forum on specification & Design Language (FDL), pp. 92-97, Southampton, United Kingdom, 14-16 Sept. 2010.

F. Fummi, G. Perbellini, D. Quaglia, R. Trenti, Exploration of Network Alternatives for Middleware-centric Embedded System Design, 13th Euromicro Conference on Digital System Design (DSD), pp. 291-297, Lille, France, 1-3 Sept. 2010.

F. Mulas F, A. Acquaviva, S. Carta, G. Fenu, D. Quaglia, F. Fummi, Network-adaptive management of computation energy in wireless sensor networks, ACM Symposium on Applied Computing (SAC), Sierre, Switzerland, pp. 756-763, 22-26 March 2010.

F. Fummi, D. Quaglia, F. Stefanni, Time-Varying Network Fault Model for the Design of Dependable Networked Embedded Systems, 12th Euromicro Conference on Digital System Design (DSD), Patras, Greece, 27-29 Aug., 2009, pp. 225-228.

D. Botturi, P. Fiorini, R. Muradore, D. Quaglia, Simulation of Networked Control Systems with Applications to Telerobotics, European Control Conference (ECC), Budapest, Hungary, 23-26 Aug., 2009, pp. 1481-1486.

A. Acquaviva, F. Fummi, G. Perbellini and D. Quaglia, Flexible Energy-Aware Simulation of Heterogeneous Wireless Sensor Networks, IEEE Design Automation and Test in Europe Conference (DATE), Nice, France, 20-24 April, 2009.

F. Fummi, G. Perbellini, D. Quaglia, S. Saggin, S. Vinco, Mixing simulated and actual hardware devices to validate device drivers in a complex embedded platform, IEEE Microprocessor Test and Verification (MTV), Austin, Texas, 07-08 Dec. 2009, IEEE, pp. 471-476

F. Fummi, G. Perbellini, D. Quaglia, S. Vinco, A SystemC-centric Approach for Simulation and Generation of WSN Applications Targeted to ZigBee, IEEE International Conference on Mobile and Ubiquitous Systems: Computing, Networking and Services (MobiQuitous), Toronto, Canada, 13-16 July, 2009, pp. 320-321

S. Cordibella, F. Fummi, G. Perbellini, D. Quaglia, A HW/SW co-simulation framework for the verification of multi-CPU systems, IEEE Workshop on High Level Design Validation and Test (HLDVT), Lake Tahoe, Nevada. November 19-21, 2008, pp. 125-131.

F. Fummi, D. Quaglia, F. Stefanni, Network Fault Model for Dependability Assessment of Networked Embedded Systems, IEEE International Symposium on Defect and Fault Tolerance of VLSI Systems (DFT 2008), Boston, MA, 1-3 Oct. 2008, pp. 54-62.

F. Fummi, D. Quaglia, F. Stefanni, A SystemC-based Framework for Modeling and Simulation of Networked Embedded Systems, ECSI Forum on specification & Design Language (FDL), Stuttgard, Germany, September 23-25, 2008, pp. 49-54.

A. Acquaviva, F. Fummi, G. Perbellini, D. Quaglia, An Energy-Aware Co-Simulation Framework

for the Design of Wireless Sensor Networks, ACM/IEEE GLSVLSI, Orlando, Florida, May 4-6, 2008.

E. Alessio, A. Bragagnini, G. Perbellini, D. Quaglia, Gateway and Middleware Design: trusted WSN-TLC network communication and enhanced WSN management, IEEE International Conference on Electronics, Circuits and Systems, Marrakech, Morocco, Dec. 11-14, 2007.

A. Bragagnini, F. Fummi, A. Huebner, G. Perbellini, D. Quaglia, Co-simulation Framework for the ANGEL Platform, IEEE International Conference on Electronics, Circuits and Systems, Marrakech, Morocco, Dec. 11-14, 2007.

F. Fummi, G. Perbellini, D. Quaglia, S. Vinco, AME: an Abstract Middleware Environment for Validating Networked Embedded Systems Applications, IEEE High-Level Design and Test Workshop, Irvine, CA, 7-9 Nov. 2007.

E. Alessio, F. Fummi, D. Quaglia, M. Turolla, Modeling and Simulation Alternatives for the Design of Networked Embedded Systems, IEEE Design, Automation and Test in Europe (DATE), Nice, France, 16-20 April, 2007.

F. Fummi, G. Perbellini, R. Pietrangeli, D. Quaglia, A Middleware-Centric Design Flow for Networked Embedded Systems, IEEE Design Automation and Test in Europe Conference (DATE), Nice, France, 16-20 April, 2007.

N. Bombieri, F. Fummi, D. Quaglia, TLM/Network Design Space Exploration for Networked Embedded Systems, ACM/IEEE International Conference on Hardware/Software Codesign and System Synthesis (CODES+ISSS), Seoul, Corea, 22-25 October, 2006.

F. Fummi, D. Quaglia, F. Ricciato, M. Turolla, “Modeling and Simulation of Mobile Gateways Interacting with Wireless Sensor Networks”, IEEE Design, Automation and Test in Europe (DATE), 6-10 March, 2006.

E. Masala, D. Quaglia, J.C. De Martin, “Variable Time-Scale Streaming For Multimedia Transmission Over IP Networks”, 13th European Signal Processing Conference (EUSIPCO), Antalya, Turkey, Sep 2005.

E. Masala, D. Quaglia, “Perceptually Optimized MPEG Compression of Synthetic Video Sequences”, IEEE International Conference on Image Processing (ICIP), Genova, Italy, September 2005, pp. 601-604.

D. Quaglia, A. Gattuso, “Model-Based MPEG Compression of Synthetic Video Sequences”, IEEE International Conference on Image Processing (ICIP), Singapore, October 2004, pp. 1109-1112.

Fabio De Vito, Davide Quaglia, Juan Carlos De Martin, “Model based Distortion Estimation For Perceptual Classification of Video Packets”, IEEE International Workshop on Multimedia Signal Processing (MMSP), Siena, September 2004, pp. 79-82.

C. Grasso, D. Quaglia, L. Farinetti, G. Fiorio, J. C. De Martin, “Wide-band Compensation of Presbycusis”, IASTED International Conference on Signal Processing, Pattern Recognition, and Applications (SPPRA 2003), Rhodes, Greece, June 2003, pp. 104-108.

G. Davini, D. Quaglia, J.C. De Martin, C. Casetti, “Perceptually-Evaluated Loss-Delay Controlled Adaptive Transmission of MPEG Video over IP”, Proceedings of IEEE International Conference on Communications, Anchorage, Alaska, May 11-15, 2003, vol. 1, pp. 577-581.

D. Quaglia, J. C. De Martin, “Adaptive Packet Classification for Constant Perceptual Quality of Service Delivery of Video Streams over Time-varying Networks”, IEEE International Conference on Multimedia and Expo (ICME 2003), Baltimora, July 2003, vol. 3, pp. 369-372.

D. Quaglia, J.C. De Martin, “Delivery of MPEG Video Streams with Constant Perceptual Quality of Service”, 2002 IEEE International Conference on Multimedia and Expo, Lausanne, Aug. 2002, vol. 2, pp. 85-88.

D. Quaglia, A. Montuori, E. Pasero, J.C. De Martin, “Interactive DSP Educational Platform for Real-Time Subband Audio Coding”, IEEE International Conference on Acoustics Speech and Signal Processing (ICASSP), Orlando, May 2002, vol. 4, pp. 4136-4139.

D. Quaglia, B. Montrucchio, Sobol Partial Distortion Algorithm for Fast Full Search in Block Motion Estimation, Eurographics Multimedia Workshop 2001, Manchester, Sept. 2001, pp. 87-94.

E. Masala, D. Quaglia, J.C. De Martin, Adaptive Picture Slicing for Distortion-Based Classification of Video Packets, IEEE International Workshop on Multimedia Signal Processing, Cannes, France, Oct. 2001, pp. 111-116.

J.C. De Martin, D. Quaglia, Distortion-Based Packet Marking for MPEG Video Transmission over Diffserv Networks, IEEE International Conference on Multimedia and Expo, Tokyo, Aug. 2001, pp. 521-524.

Refereed national conferences

J.C. De Martin, D. Quaglia, E. Masala, A.R. Meo, “Classificazione Percettiva di Dati Multimediali”, XXXIX Congresso Annuale Associazione Italiana per il Calcolo Automatico (AICA), Como, Sett. 2001, pp. 341-351.

6.3 Research projects

2017-2018: Local project “Directional Augmented REality (DARE)”. Augmented Reality (AR) technologies for eye-wear and head-mounted devices currently require large form factors, weight, cost as well as more frequent recharging cycles that reduce usability. This comes as no surprise since connectivity, image capture & processing, localization, orientation, and direction lead to high processing and power requirements. A multi-antenna system, patented by the industrial partner, enables a new generation of smart eye-wear that elegantly requires less hardware, connectivity, and power to provide AR functionalities. They will allow users to locate nearby radio emitting sources that highlight objects of interest (including people or retail items). This solution, is supported by existing standards like Bluetooth Low Energy, Apple’s iBeacon and Google’s Eddystone. It also

fosters dynamic scenarios for people interaction. This project aims at developing embedded technology for low-cost, low-form factor, low-power equipment to be unobtrusively integrated into traditional glasses. The research methodology will follow two paths. On one side, an actual prototype will be built by using hardware components off-the-shelf. On the other side, a complete simulation platform will be created to reproduce the behavior of the final glasses.

2017-2018: Project funded by Regione del Veneto “Greenhouse automatic control by using cloud technology and Internet of Things”. The project aims at improving prediction models and control algorithms for protected crops in the specific context of Vertical Farming.

2017-2018: Project funded by Fondazione CARIGE “Studenti in cammino nel verde 2.0 (I-PLANTS)”. The project, in partnership with Consiglio per la Ricerca in agricoltura e l’analisi dell’Economia Agraria (CREA), aims at developing a smartphone app for the interaction between people (in particular students) with plants in a botanic garden.

2017-2018: Project funded by Parco Regionale Alpi Liguri “Improvement of smartphone app for turism”. The project aims at developing a multi-platform multi-language smartphone app to improve the experience of Parco’s visitors especially concerning discontinuous Internet connectivity in rural areas.

2016-2018: Local project “EXtra-field Plant Observation for monitoring and forecast of agricultural infections”. The project, spanning over 2 years, aims at improving knowledge, methodologies, and technology for greenhouse control to increase productivity and reduce plant pathogens. The research has the following objectives: 1. development of a ZigBee wireless sensor for contactless measurement of leaf temperature; 2. further investigation of the binomia "Basil-Peronospora" through fine-grain sensor monitoring; 3. creation of a mathematical model linking physical environmental parameters, plant grow, and disease development; 4. creation of a prediction model of plant grow and disease development as a function of physical environmental parameters and weather forecast; 5. creation of a monitoring and control system fostering plant grow and reducing disease development with application to the binomia "Basil-Peronospora"; 6. wireless extension of the current control architecture with compliance to industrial standards like ZigBee.

2013-2016: European project “Design of embedded mixed-criticality CONTRol systems under consideration of EXtra-functional properties (CONTREX)” FP7-ICT-2013-9-611146: Up to now mission & safety critical services of SoS (Systems of Systems) have been running on dedicated and often custom designed HW/SW platforms. In the near future such systems will be accessible, connected with or executed on devices comprising off-the-shelf HW/SW components. Significant improvements have been achieved supporting the design of mixed-critical systems by developing predictable computing platforms and mechanisms for segregation between applications of different criticalities sharing computing resources. Such platforms enable techniques for the compositional certification of applications’ correctness, run-time properties and reliability. CONTREX will complement these important activities with an analysis and segregation along the extra-functional properties real-time, power, temperature and reliability.

2011-2014: European project “SMArt systems Co-design (SMAC)” FP7-ICT-2011-7-288827: Smart systems consist of heterogeneous subsystems and components providing different functionalities; they are normally implemented as “Multi-Package on a Board”. To fully exploit the potential of current nanoelectronics technologies, as well as to enable the integration of existing/new IPs and “More than Moore” devices, smart system miniaturization and “Multi-Chip in a Package” implementation are unavoidable. Such goals are only achievable if a flexible software platform (i.e., the SMAC platform) for smart subsystems/components design and integration is made available to designers and system integrators. The platform must include methodologies and EDA tools enabling multi-disciplinary and multi-scale modeling and design, simulation of multi-domain systems, subsystems and components at all levels of abstraction, system integration and exploration for optimization of specific metrics, such as power, performance, reliability and robustness.

2012-2013: “Integrated traceability and real-time process verification applied the production of flour from organic grains from stone mills (E-FLOUR)”: The main objective of the project is the integration of automatic identification through interactive labels, traceability in the production process of different flour cereals, monitoring of the environment and the monitoring of nutritional and microbiological quality of the raw cereals. The exploitation of such integrated information for the real-time verification of the business process.

2009-2013: National project “E-Cube”: The E-Cube project proposes to study, develop and implement innovative HW/SW technologies which enable the efficient management of energy in the components of the system. Special attention is given to the identification of architectures and solutions which ensure the identification and authentication of the user, by exploiting a service personalization which will take into account the requirements of both the user and overall community.

2009-2013: European project “COdesign and power Management in PLatform-based design space EXploration (COMPLEX)” FP7-IST-247999: The main objective of the COMPLEX project is to increase the competitiveness of the European semiconductor, system integrator and EDA industry by addressing the problem of platform-based design space exploration (DSE) under consideration of power and performance constraints early in the design process. High performance usually causes high power consumption. A main challenge in today’s embedded system design is to find the perfect balance between performance and power. This balance can not be found efficiently and at high quality, because until now no generic framework for accurately and jointly estimating performance and power consumption starting at the algorithmic level is available. This can only be achieved in cooperation on a European level, taking into account European platform providers, system developers/integrators, EDA companies, Universities and research institutes from both, the HW and the embedded SW world. Davide Quaglia is contributing to the creation of a virtual platform by providing tools to generate abstract SystemC modules starting from Matlab/Stateflow descriptions, RTL SystemC modules, and network scenarios.

2009-2010: “An Embedded Networked Architecture to control the fermentative processes for starter cultures to be used for wine production (eWINE)”: The project aims at developing a

networked embedded architecture (an EPC-GLOBAL compliant middleware called eEPC) to control the fermentative processes for starter cultures to be used for wine production. In particular, it is necessary to design an open-platform solution in order to apply the architecture to any hardware/software configuration (e.g., PC, Tabled-PC, Palm, touch-screen, mobile terminal, etc.). In this way, the use of eEPC in any steps of the supply-chain is guaranteed.

2008-2011: European project "Control for coordination of distributed systems (CON4COORD)" FP7-ICT-2007-2-223844: the project aims at developing methodologies and tools for the control of very large distributed systems connected through traditional commuication networks; the personal contribution to the project is the study of methodologies for modelling and simulation to support control design and the study of coimmunication techniques suitable for the delivery of control information on traditional networks.

2007-2009: Local project "Configurable Embedded Platform for Broadband Wireless Communications over Transportation Systems (WirelessTransPlat)". The project aims at developing a configurable embedded platform for broadband wireless communications in transportation systems. In particular the project aims at providing: 1) broadband network interconnection within trains (on-board vehicular wireless LAN) to transmit information and audio/video content between coaches; 2) broadband interconnection of the on-board vehicular wireless LAN with the terrestrial network to allow information delivery and access to the public Internet; 3) interconnection between railway stations for video surveillance and remote monitoring of systems. To demonstrate the results of the project we will develop a prototype of the embedded platform and a streaming application for the delivery of multimedia contents over the on-board vehicular wireless LAN.

2006-2008: European project "Advanced Networked embedded platform as a Gateway to Enhance quality of Life (ANGEL)" FP6-2005-IST-5-033506. The main objective of this proposal is to develop methods and tools for building heterogeneous systems in which WSN's and traditional communication networks cooperate to monitor and improve the quality of life in common habitats, e.g., home, car and city environment. In particular the maintenance of the personal health potentiality will be addressed. In the analyzed scenario, users communicate with WSN's through a dedicated node called gateway. This node is responsible for injecting queries into the network, gathering responses and presenting them to users. The gateway communicates with the WSN through short-range wireless links, and it interacts with the user directly or remotely through traditional communication networks both wireline and mobile. The project considers the mobile handset as the ad hoc gateway. The usage of a co-simulation tool, based on NS-2, SystemC and ISS, guarantees the optimized interaction between the ad hoc network and the mobile infrastructure.

2005-2006: national project PRIN 2005 named "Modelling, simulation and verification of platforms for MPSoC's". The main effort of this research unit has been spent developing a platform modeling/simulation/verification framework that allows the exploitation of the following aspects: 1) Hardware/network co-simulation via the integration of the system level SystemC language with network simulators, 2) Hardware/software/middleware co-simulation via the

integration of the system level SystemC language with compiled embedded software, 3) Assertion-based verification of the hardware part via the integration of the SystemVerilog language with the co-simulation framework and/or supporting SystemC/PSL descriptions. The SystemC extension of C++ will be the reference system-level design language of the project due to its characteristics. On the contrary, SystemVerilog will be exploited to allows assertion-based verification at behavioral and register transfer level (RTL). Both languages are joint into the modeling/verification framework.

6.4 Activity in international technical program committees

Davide Quaglia is active member of the following technical program committees:
- Design Automation and Test in Europe (DATE)
- ACM Workshop on Rapid Simulation and Performance Evaluation: Methods and Tools (RAPIDO)
- EUROMICRO Conference on Digital System Design (DSD)

Davide Quaglia was guest editor of the Special Section on Cyber-Physical Systems: Extending the Networks to the Real-World di Elsevier Microprocessors and Microsystems Volume 39, Issue 8, Pages 599-1318 (November 2015) together with Prof. Marc Geilen. In 2015 the journal was in Q3 regarding ING-INF/05 topics.

In 2014 Davide Quaglia was General Chair of EUROMICRO Conference on Digital System Design (DSD) and Euromicro Conference on Software Engineering and Advanced Applications (SEAA).

Davide Quaglia has been reviewer of:
- IEEE Transactions on Circuits and Systems for Video Technology
- IEEE Transactions on Image Processing
- IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems
- IEEE International Symposium on Circuits and Systems (ISCAS)
- Vehicular Technology Conference
- IEEE International Conference on Communications (ICC)
- IEEE Design, Automation and Test in Europe (DATE)
- IEEE Design and Automation Conference (DAC)

7 Teaching activities

Since 2006 Davide Quaglia has been member of the Council of the PhD School in Computer Science - Department Computer Science. In that context he taught “Multimedia Communications” in 2008 and “Modeling and Simulation of Heterogeneous Systems” in 2016.

Since 2005 Davide Quaglia has been member of Collegio Didattico di Informatica - Department Computer Science for the following teaching activities:

- **HW Architectures for Bioinformatics** – BSc, University of Verona *(2008/2009 up to present)*
- **Networked Embedded Systems** – MSc, University of Verona *(2011/2012 up to present)*
- **Network Programming** – BSc, University of Verona *(2014/2015 up to present)*
- **Computer Networks** – BSc, University of Verona *(2006/2007 up to 2008/2009)*
- **Multimedia Architectures** – MSc, University of Verona *(2004/2005 up to 2010/2011 and 2016/2017)*

Since 2005 Davide Quaglia has been supervisor of about 50 bachelor and master thesis in the Department of Computer Science of University of Verona.

8 Technology transfer

Davide Quaglia has been responsible of four agreements with external institutions for technology transfer.

In 2007 Davide Quaglia was co-founder of EDALab s.r.l., a spin-off company of the University of Verona.

9 International collaborations

Davide Quaglia got a grant for a position of invited researcher at Laboratoire d'Electronique, Antennes et Télécommunications (LEAT) of the University of Nice-Sophia Antipolis (October 2014).

Davide Quaglia collaborates with the INRIA research center in Nice-Sophia Antipolis.

Verona - Italy, January 19, 2018 Signature: _____