Gianmaria De Tommasi

Dipartimento di Ingegneria Elettrica e delle Tecnologie dell'Informazione, University Naples Federico II
Address: Via Claudio 21, 8100, Naples, ITALY · Phone: +39-081-76-83853
Email: detommas@unina.it · Web: http://wpage.unina.it/detommas

Biosketch

Gianmaria De Tommasi was born in [redacted]. He received the Laurea degree (*summa cum laude*) in *Electronic Engineering* from the University of Naples Federico II in 2001.

From September 2000 to September 2001 he worked for a Siemens Industrial Services company located in Torre Annunziata (Naples, Italy), where he designed and developed control systems for industrial automation.

From October 2001 to April 2002 he won the MARS Scholarship Programme and he worked for the Microgravity Advanced Research and Support Center in Naples, where he designed and developed control and data acquisition software.

Since 2002 he is with Department of Electrical Engineering and Information Technologies of the University of Naples Federico II, where he received the *Research Doctorate* degree in *Computer and Automation Engineering* in 2005, and where he is currently *Full Professor* in *Systems and Control Engineering*.

Since 2002 he has been visiting researcher at the Joint European Torus (JET, UK), at the ITER Organization (France), at the Naka Fusion Institute (Japan), and at the Institute of Plasma Physics of the Chinese Academy of Science (People's Republic of China), where he has participated to various projects connected to plasma magnetic control. In May 2019, Gianmaria De Tommasi has been nominated *Deputy Coordinator* for the European contribution to the Integrated Commissioning of the JT-60SA tokamak.

Gianmaria De Tommasi is member *IEEE Member* since 2006, and he has been elevated to *Senior Member* in March 2011.

His current research interests include control of nuclear fusion devices; fault detection, opacity and identification of discrete event systems modelled with Petri nets; privacy of cyber-physical systems; stability of hybrid systems. On these subjects he has published more than 250 journal and conference papers, and coauthored two monographs titled *Finite-Time Stability and Control* and *Finite-Time Stability: An Input-Output Approach* (the complete list of publications can be found at http://wpage.unina.it/detommas/publications.html).

Education

[Dec. 2005] *Research Doctorate degree* - University of Naples Federico II.

[2002-2005] *Research Doctorate* in Computer and Automation Engineering at the University of Naples Federico II (curriculum in Control and Systems Engineering):

Advisor: Prof. Alfredo Pironti

Thesis: *Plasma magnetic and kinetic control in a tokamak*

[Jun. 2001] *Professional Engineer* certificate.

[Mar. 2001] *Laurea degree* in Electronic Engineering, *summa cum laude* – University of Naples Federico II.

University Employment

[2020-pres.] *Full Professor* of Systems and Control Engineering at the Department of Electrical Engineering and Information Technologies, University of Naples Federico II.

[2014-2020] *Associate Professor* of Systems and Control Engineering at the Department of Electrical Engineering and Information Technologies, University of Naples Federico II.

[2006-2014] *Assistant Professor* of Systems and Control Engineering at the Department of Electrical Engineering and Information Technologies, University of Naples Federico II; tenured since March 2009.

Other Appointments/Employments

[Feb. 2021-pres.] *Member* of JT-60SA International Fusion School Advisory Board (JAB)

[Jul. 2019-pres.] *Chair* of the Automation Engineering & Robotics courses at University of Naples Federico II

[2019-pres.] *Deputy Coordinator* for the European contribution to the Integrated Commissioning of the JT-60SA tokamak.

[2018] *Chair* of the EU Remote Experimentation Centre for JT-60SA Working Group setup by EUROfusion.

[2014-pres.] *Visiting Researcher* at the EAST tokamak, Institute of Plasma Physics of the Chinese Academy of Sciences (Hefei, PRC), as member of the *EUROfusion Consortium*.

[2013-pres.] Member of the *Academic Board* of the Ph.D. course "Fusion Science and Engineering", University of Padova, Italy.

[2013-pres.] *Visiting Researcher* at the International Fusion Energy Research Centre in Rokkasho (Japan) and at the Naka Fusion Institute (Japan) as part of the European team for the ITER Remote Experiment Centre and as member of the European team for the integrated commissioning of the JT-60SA tokamak.

[2013-2015] *Seconded National Expert* at the European Agency Fusion for Energy, Barcelona, Spain.

[2009-pres.] *Visiting Researcher* at the ITER Organization, St. Paul-lez-Durance (France).

[2002-pres.] *Scientific consultant* as expert in control systems analysis and design for the *CREATE Consortium*, Naples (Italy).

[2002-2018] *Visiting Researcher* at the JET tokamak, Culham Science Centre (UK), as member of the *EURATOM-ENEA-CREATE Association* and for the *EUROfusion Consortium*.

[Oct. 2001-Apr. 2002] Winner of the *MARS Scholarship Programme 2001* at the *Microgravity Advanced Research & Support Center*, Naples (Italy).

[Sep. 2000-Sep. 2001] *Scholarship winner* employed in a research project for *PdA Impianti* a company of the Siemens Industrial Services group locate in Torre Annunziata (Italy).

Scientific Activity

Grants & Projects

[2019-pres.] Member of the JT-60SA *Integrated Project Team (IPT)*.

[2018] Participation to the task titled "Control laws and observers to improve runaway electrons beam stabilization" at the JET tokamak for the 2018-2019 experimental campaign.

[2015-2017] Participation to the EUROfusion Enabling Research project titled "Fast Model Predictive Control for Magnetic Plasma Control".

[2013-2015] *Responsible Officer* of the European contribution to the following tasks of the ITER Remote Experimentation Centre (REC) (activity carried out as Seconded National Expert at Fusion For Energy): Remote Experiment System; Remote Data Access Software; Plasma Simulator.

[2013-2020] Member of the ITER REC *Integrated Project Team (IPT)*.

[2013-2016] Participation to the National Research Project *Effetti tridimensionali, non lineari e multiphysics nella modellistica e nel controllo dei dispositivi per la fusione termonucleare controllata*, supported by the Ministry of University, Scientific Research and Technology.

[2013] Participation to the task *T13-12: Develop and promote the use of Extreme Shape Controller (XSC) and Current limit avoidance (CLA) in JET scenarios* during the JET experimental campaign.

[2011-2012] *Scientific Coordinator* of the experiment titled "Application of the Current Limit Avoidance (CLA) in condition of low disruption probability and low forces at disruption" during the JET experimental campaign.

[2010-2012] *Project Leader* of the *Current Limit Avoidance Implementation Project* for the JET tokamak.

[2010-pres.] Expert member of the *ITER Plasma Control Group (PCG)*.

[2009-pres.] Member of the design team of the following ITER contracts: Development Of A Rapid Prototype Simulator For The Central Safety System, Engineering Models for Feedback Control and Machine Protection, Preliminary Design of the ITER Plasma Control System, Final Design of the ITER Plasma Control System, Design of the controllers for the Correction Coils.

[2007-2009] Participation to the *Plasma Control Upgrade* project for the JET tokamak.

[2006-2008] Participation to the National Research Project *Modelling and Control of Resistive Wall Modes in toroidal fusion devices in presence of 3D conductors*, supported by the Ministry of University, Scientific Research and Technology.

[2002-2003] Participation to the *eXtreme Shape Controller* project for the JET tokamak.

Research Collaborations

[2013-pres.] Institute of Plasma Physics of the Chinese Academy of Science (People's Republic of China) on the following topic: design of advanced plasma magnetic control systems.

[2013-pres.] National Institutes for Quantum and Radiological Science and Technology (Japan) on the following topics: remote experimentation systems; plasma magnetic modelling and control.

[2012-2018] Institut Jožef Stefan in Ljubljana (Slovenia) on the following topic: design of model predictive control for fusion devices.

[2009-pres.] ITER Organization, St. Paul-lez-Durance (France) on the following topics: modelling support for the design of the safety and interlock systems; design of the plasma control system.

[2009-pres.] Istituto Superior Técnico of Lisbon (Portugal) on the following topics: design of real-time systems for fusion devices, plasma magnetic control.

[2009-pres.] University of Rome Tor Vergata (Italy) on the following topics: anti wind-up systems for magnetic control in fusion device, control of runaway electrons.

[2007-pres.] University of Naples Parthenope (Italy) on the following topic: finite time stabilization of hybrid systems.

[2007-pres.] University of Catanzaro (Italy) on the following topic: finite time stabilization of hybrid systems.

[2005-pres.] University of Salerno (Italy) on the following topics: fault detection and diagnosability of discrete event systems; identification of discrete event systems modeled with timed Petri nets; enforcement of privacy in cyber-physical systems.

[2002-2019] JET (Joint European Torus) tokamak, Culham Science Centre, Abingdon (UK) on the following topics: design and development of plasma current, position and shape controller; development of a flexible and reusable software architecture for portable real-time applications; plasma control support during the experimental campaigns.

Teaching Activity

Academic Courses - Current Classes

[2005/2006-2020/2021] *Industrial Automation Technologies* (Tecnologie dei Sistemi di Automazione e Controllo), 1st Level *Laurea* in Automation Engineering at University of Naples Federico II.

[2019/2020-2020/2021] *Discrete Event Systems and Supervisory Control* (in English), 2nd Level *Laurea Magistrale* in Automation Engineering at University of Naples Federico II.

Academic Courses - Past Classes

[2017/2018-2018/2019] *IT Technologies for Industrial Automation* (Tecnologie Informatiche per l'Automazione Industriale), 1st Level *Laurea* in Computer Science Engineering at University of Naples Federico II.

[2013/2014-2018/2019] *Discrete Event Systems* (Sistemi ad Eventi Discreti), 2nd Level *Laurea Magistrale* in Automation Engineering at University of Naples Federico II.

[2008/2009-2010/2011] *Supervisory Control* (Controllo di Supervisione), 2nd Level *Laurea* in Automation Engineering at University of Naples Federico II.

[2010/2011] *System Theory* (Teoria dei Sistemi), 1st Level *Laurea* in Automation Engineering at University of Naples Federico II.

[2008/2009] *Digital Control* (Controllo Digitale), 2nd Level *Laurea* in Automation Engineering at University of Naples Federico II.

[2007/2008] *Fundamentals of Dynamical Systems* (Fondamenti di Sistemi Dinamici), 1st Level *Laurea* in Electronic Engineering at Italian Air Force Academy.

[2006/2007] *Fundamentals of Automation* (Elementi di Automazione), 1st Level *Laurea* in Computer Engineering at University of Naples Federico II.

Other Courses

[Dec. 2020] Lecturer of the *ad hoc* course titled *From observability to privacy and security in discrete event systems*, for the ITEE PhD programme, University of Naples Federico II.

[Oct. 2020] Training course on *HW and SW technologies for industrial automation* for the Leonardo Labs - Aerotech Academy, Naples.

[Jun. 2019] Lecturer at the *Advanced Course on Plasma Diagnostics and Control* held at the University of Padova and Consorzio RFX, Padova, Italy.

[Dec. 2017] Seminars on Plasma Magnetic Control in Tokamaks at Instituto Superior Técnico/IPFN, Lisboa, Portugal.

[May 2017] Lecturer at the *Advanced Course on Plasma Diagnostics and Control* held at the University of Padova and Consorzio RFX, Padova, Italy.

[Apr. 2017] Lecturer at *International School of Fusion Reactors Technology* held at the *Ettore Majorana Centre*, Erice, Italy.

[Apr. 2016 and May 2017] Seminar on Real-time control systems in fusion experimental devices held at the *University of Salerno*, Salerno, Italy.

[Oct. 2012] Training course on *Digital control* and *Nonlinear simulations* for Ansaldo Breda, Naples, Italy.

[Jan. 2012] Seminars on Plasma Control in Tokamaks at Department of Systems and Control held at *Institut Jožef Stefan*, Ljubljana, Slovenia.

[Jun. 2010] Lecturer at the *4th ITER International Summer School* held at the University of Texas at Austin.

[Nov. 2009] Lecturer at the *EFDA Goal Oriented Training in Theory on Magnetic Control of Tokamak Plasmas* held at University of Naples Federico II.

Boards and Committees

[Apr. 2021] Member of the Exam Committee for the Ph.D. programme of Dr. Luca Calacci - University of Rome "Tor Vergata" (Italy).

[Jan. 2021] Member of the Exam Committee for the Ph.D. programme of Dr. Lilia Doménica Corona Rivera - Instituto Superior Técnico - Univeridade Técnica de Lisboa (Portugal).

[Mar. 2020] Member of the Exam Committee for the Ph.D. course titled Fusion Science and Engineering - University of Padova (Italy).

[Jul. 2018] Member of the Exam Committee for the Ph.D. programme of Dr. Martynas Prokopas - Instituto Superior Técnico - Univeridade Técnica de Lisboa (Portugal).

[Jul. 2018] Member of the Exam Committee for the Ph.D. programme of Dr. Miguel da Gama Falcão Correia - Instituto Superior Técnico - Univeridade Técnica de Lisboa (Portugal).

[Apr. 2018] Member of the Exam Committee for the Ph.D. course titled Fusion Science and Engineering - University of Padova (Italy).

[Mar. 2018] Member of the Exam Committee for the Ph.D. course titled Information Engineering - University of Naples "Parthenope" (Italy).

[Jun. 2017] Member of the Exam Committee for the Ph.D. programme of Mr. Luca Boncagni - University of Rome "Tor Vergata" (Italy).

[Apr. 2014] Member of the Exam Committee for the Ph.D. course titled *Biomedical and Computer Science Engineering* at the University of Catanzaro (Italy).

[Apr. 2011] Member of the *panel for the evaluation* of the Ph.D. programme of Dr. André Neto - Istituto Superior Técnico of Lisbon (Portugal).

[2011-pres.] Referee for the Evaluation of research projects on behalf of the Italian Ministry of Education, University and Research.

[Mar. 2011] Member of the Exam Committee for the Ph.D. course titled *Electrical and Automation Engineering* at the University of Reggio Calabria (Italy).

[Jan. 2010] Member of the Exam Committee for the Ph.D. course titled *Biomedical and Computer Science Engineering* at the University of Catanzaro (Italy).

[Feb. 2009] Member of the Exam Committee for the Ph.D. course titled *Electrical and Automation Engineering* at the University of Reggio Calabria (Italy).

Editorial Service

[2018] *Editor* of the 14th IFAC Workshop on Discrete Event Systems (WODES'18) held in Sorrento, Italy, May 2018.

[2014] *Guest Editor* of the Fusion Engineering and Design special issue titled "Design and implementation of real-time systems for magnetic confined fusion devices"

Conference Service

[2010-pres.] Member of the IEEE Control System Society Conference Editorial Board.

[2019] Associate Editor of 2019 European Control Conference

[2019] Co-chair of the tutorial committee of the 3rd IEEE International Conference on Robotic Computing (IEEE IRC 2019)

[2018] Associate Editor of 2018 European Control Conference

[2018] Member of the Program Committee of the IEEE International Conference on Systems, Man, and Cybernetics 2018 - IEEE SMC 2018.

[2017] Member of the Program Committee of 14th IEEE International Conference on Networking, Sensing and Control 2017, ICNSC 2017.

[2016] Member of the Program Committee of the IEEE International Conference on Systems, Man, and Cybernetics 2016 - IEEE SMC 2016.

[2016] Associate Editor of IEEE CASE/ISAM 2016.

[2014] Member of the Program Committee of the IEEE International Conference on Systems, Man, and Cybernetics 2014 - IEEE SMC 2014.

[2013] Member of the Program Committee of the IEEE International Conference on Systems, Man, and Cybernetics 2013 - IEEE SMC 2013.