

# Curriculum Vitae: Tommaso Cucinotta

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## Personal data

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*Birth date and place:* April 1974, Potenza (Italy)

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## Current status

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**Dec 2015 to date:** *Associate Professor* at the Real-Time Systems Laboratory (ReTiS) of Scuola Superiore Sant'Anna

**July 2019 to date:** *Head* of the Real-Time Systems Laboratory (ReTiS) of Scuola Superiore Sant'Anna

### RESEARCH TOPICS & COMPETENCIES

- Real-time and reliable NoSQL Database systems for cloud services
- Adaptive resource management and scheduling in Cloud Computing & Network Function Virtualization infrastructures
- Artificial Intelligence and Machine Learning to support Data Center Operations in Cloud & NFV infrastructures
- Platforms for real-time data streaming and analytics
- Quality of service control for adaptive soft real-time applications, including multimedia and IMS systems
- Operating Systems for real-time and embedded applications and many-core and massively distributed systems
- Trusted computing and confidentiality in cloud computing
- Smart-cards: interoperability, protocols and architectures
- Digital signatures, biometrics identification, multicast security

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## Experience highlights (details below)

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- 8 Granted and 21 Filed EU and US Patents** in the areas of security, resource management and scheduling
- 35 International Journal Publications**, including [IEEE Transaction on Computers](#), [IEEE Transaction on Cloud Computing](#), [IEEE Transaction on Industrial Informatics](#), and [ACM Transactions on Embedded Computing Systems](#)
- 103 International Conference and Workshop Peer-reviewed Publications and 14 Book Chapters**
- 3 EU Projects scientific responsibility** (overall, raised and managed funds for ~900K EUR), made significant contributions to **8 EU Projects** and other national research projects
- General or program co-chair** of 16 international conferences or workshops
- Guest editor** of 5 special issues of international journals; reviewed several papers for international journals
- Program committee member** of more than 40 international conferences and workshops
- Mentored** 9 PhD students, 13 under-graduate students for their MSc thesis and 3 Bell Labs interns
- >40 teaching assignments**
- 2 years Software Engineer in AWS**, improving performance and scalability of **DynamoDB**
- 5 consultancy assignments by external companies for production-quality software (in the areas of embedded systems, multimedia applications and Linux kernel)
- 14 open-source projects** created and/or contributed to
- Long-standing experience in low-level programming since age of 12, including: development of 100% Assembler applications (text, image, music editors, demos on Commodore 64 and Amiga 500) with direct access to hardware and interrupt registers; writing of malwares propagating through disk boot sector infection; hacking into object code of Windows applications for breaking license verification code

### AWARDS AND RECOGNITIONS

- Apr 2021:** [Best Student Paper Award](#) for co-authored paper at CLOSER 2021
- May 2020:** [Best Paper Award](#) for co-authored paper at CLOSER 2020
- Feb 2020:** [Best Paper Award](#) for co-authored paper at ICN 2020
- Mar 2019:** [Best Paper Award](#) for co-authored paper at ICN 2019
- Apr 2018:** [Best Paper Award](#) for co-authored paper at ICN 2018
- Apr 2014:** Selected as [featured researcher profile](#) in highlight on the Bell Labs website
- Jul 2018:** Eligibility as full professor in Computer Engineering (Abilitazione Scientifica Nazionale da professore di I Fascia nel SC 09/H1 – SSD ING-INF/05)
- Nov 2020:** Eligibility as full professor in Computer Science (Abilitazione Scientifica Nazionale da professore di I Fascia nel SC 01/B1 – SSD INF/01)

- ❑ **Oct 2013:** [IEEE Senior Member grade](#) elevation
- ❑ **Dec 2010:** [Best-paper award](#) for co-authored paper at IEEE SOCA 2010

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### PhD Board Membership

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- ❑ **a.y. 2021/22, 2022/23, 2023/24:** **Board Member** of the National PhD in Artificial Intelligence – AI & Society branch at Scuola Superiore Sant'Anna, jointly offered with University of Pisa, Politecnico di Torino, National Research Council and others
- ❑ **a.y. 2017/18, 2018/19, 2019/20, 2020/21:** **Board Member** of the PhD in Data Science, joint program at Scuola Superiore Sant'Anna, Scuola Normale Superiore, University of Pisa, National Research Council and Scuola IMT Lucca
- ❑ **a.y. 2016/17, 2022/23:** **Board Member** of the PhD in Emerging Digital Technologies at Scuola Superiore Sant'Anna

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### Organization of international peer-reviewed events and editorial roles in peer-reviewed international journals

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- ❑ **Associate Editor** for [IEEE Transactions on Services Computing](#), Oct 2023 to date
- ❑ **Guest Editor** of the Special Issue on Virtualization in High-Performance Cloud Computing of the Elsevier Journal of Systems Architecture (JSA), 2023
- ❑ **General Co-Chair** of the 18<sup>th</sup> International Workshop on Virtualization in High-Performance Cloud Computing (VHPC 2023), May 25<sup>th</sup> 2023, Hamburg, Germany, co-located with ISC-HighPerformance 2023
- ❑ **General Co-Chair** of the 5<sup>th</sup> International Workshop on Power Management and Scheduling in the Linux Kernel (OSPM Summit), Apr 17-19 2023, Ancona (Italy)
- ❑ **General Co-Chair** of the 17<sup>th</sup> International Workshop on Virtualization in High-Performance Cloud Computing (VHPC 2022), June 2<sup>nd</sup> 2022, Hamburg, Germany, co-located with ISC-HighPerformance 2022
- ❑ **Guest Editor** of the Special Issue on the 2020 IEEE Symposium on Real-time Distributed Computing (ISORC 20) of the Elsevier Journal of Systems Architecture (JSA), 2022
- ❑ **Program Co-Chair** of the 23<sup>rd</sup> IEEE International Symposium on Real-Time Distributed Computing (ISORC 2020), May 12-14 2019, Nashville, USA
- ❑ **General Co-Chair** of the 4<sup>th</sup> International Workshop on Power Management and Scheduling in the Linux Kernel (OSPM Summit), May 11-13 2020, Pisa (Italy)
- ❑ **General Co-Chair** of the 3<sup>rd</sup> International Workshop on Power Management and Scheduling in the Linux Kernel (OSPM Summit), May 20-22 2020, Pisa (Italy)
- ❑ **General Co-Chair** of the 2<sup>nd</sup> International Workshop on Power Management and Scheduling in the Linux Kernel (OSPM Summit), April 16-18 2018, Pisa (Italy)
- ❑ **General Co-Chair** of the 1<sup>st</sup> International Workshop on Power Management and Scheduling in the Linux Kernel (OSPM Summit), April 3-4 2017, Pisa (Italy)
- ❑ **General Co-Chair** of the 9<sup>th</sup> International Workshop on Virtualization in High-Performance Cloud Computing (VHPC 2014), August 25-29 2014, Porto, Portugal, co-located with Euro-Par 2014
- ❑ **General Co-Chair** of the 2<sup>nd</sup> International Workshop on Real-Time and Distributed Computing in Emerging Applications (REACTION 2013), December 2013, Vancouver, Canada, co-located with IEEE RTSS 2013
- ❑ **Guest Editor** of the Special Issue on Real-time and distributed computing in emerging applications (REACTION) of the Elsevier Journal of Systems Architecture (JSA), Vol. 61, Issue 5-6, May 2015
- ❑ **General Co-Chair** of the 4<sup>th</sup> International Workshop on Analysis Tools and Methodologies for Embedded and Real-time Systems (WATERS 2013), July 2013, Paris, France, co-located with ECRTS 2013
- ❑ **General Co-Chair** of the International Workshop on Real-Time and Distributed Computing in Emerging Applications (REACTION 2012), December 2012, San Juan, Puerto Rico, co-located with IEEE RTSS 2012
- ❑ **General Co-Chair** of the 3<sup>rd</sup> International Workshop on Analysis Tools and Methodologies for Embedded and Real-time Systems (WATERS 2012), July 2012, Pisa, Italy, co-located with ECRTS 2012
- ❑ **Guest Editor** of two Special Issues on Analysis Tools and Methodologies for Embedded and Real-time Systems (WATERS) of the Elsevier Journal of Systems Architecture (JSA), 2012-2014
- ❑ **General Co-Chair** of the 2<sup>nd</sup> International Workshop on Analysis Tools and Methodologies for Embedded and Real-time Systems (WATERS 2011), July 2011, Porto, Portugal, co-located with ECRTS 2011
- ❑ **Program Co-Chair** of the Fourth IEEE International Workshop on Real-Time Service-Oriented Architecture and Applications (RTSOAA 2011), December 2011, Irvine, CA, co-located with IEEE SOCA 2011.

- **General Co-Chair** of the 1st International Workshop on Analysis Tools and Methodologies for Embedded and Real-time Systems (WATERS 2010), July 2010, Brussels, Belgium, co-located with ECRTS 2010

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## Research grants

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- **Jan 2020 – Dec 2022: Head** of the research unit at Scuola Superiore Sant'Anna within the AMPERE European Project (H2020 ICT 871669)
- **Feb 2008 – Feb 2011: Head** of the research unit at Scuola Superiore Sant'Anna within the IRMOS European Project (FP7 ICT 214777)
- **Feb 2010 – Jan 2012: Head** of the research unit at Scuola Superiore Sant'Anna within the S(o)OS European Project (FP7 FET 248465)

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## Peer-review for international journals, conferences and workshops

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- **Review Committee Member** for the 2014 EuroSys Roger Needham PhD Award
- **Program Committee member** of IEEE IC2E 2021-2023, IEEE SDN-NFV 2020, IEEE RTAS 2018, 2017, 2013 and 2012, IEEE ICPS 2018, IEEE INDIN 2018, CLOSER 2020, 2019, 2014 and 2013, IEEE ETFA 2021-2019, 2017 and 2012, IEEE SIES 2013
- **Program Committee member** of MobileServerless 2021, VHPC 2021-2018 and 2010-2012, IEEE SOCNE 2017, 2012 and 2011, EwiLi 2017, ACM CF 2017, REACTION 2017, SeaClouds 2014, RTLWS 2012, OPODIS 2011, IEEE/IFIP EUC 2011, IEEE ICSS 2011, CLOSER 2011-2013, CSPNA 2011, IEEE SOCA 2010-2012, SOMRES 2011, the Workshop on trends, issues and challenges in future high-end computing, AHM 2010, CDC, DATE
- **Reviewer** for: IEEE Transactions on Computers, on Automatic Control, on Cloud Computing, on Industrial Informatics, on Parallel and Distributed Systems, on Mobile Computing; Springer Journal on Real-Time Systems, on Service Oriented Computing and Applications; Wiley Software Practice & Experience; Elsevier Journal on Systems and Software, on System Architecture, on Computer and Systems, on Parallel and Distributed Computing.

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## Professional experience

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- **Jul 2014 to Feb 2016:** Senior Software Development Engineer at **Amazon DataBase Services**, Dublin (Ireland), working on aspects related to the real-time performance of AWS DynamoDB.
- **Jan 2012 – Jun 2014:** Researcher (Member of Technical Staff) at Bell Labs, Alcatel-Lucent, Dublin (Ireland).
- **Oct 2011 – Jan 2012:** Research Associate at the Real-Time Systems Laboratory (RETIS) of Scuola Superiore Sant'Anna (SSSA), Pisa (Italy).
- **Oct 2005 – Sep 2011:** Assistant Professor at the Real-Time Systems Laboratory (RETIS) of Scuola Superiore Sant'Anna (SSSA), Pisa (Italy).
- **Feb 2009:** Consultant for Evidence s.r.l., Pisa: development of a G.729 codec for a VoIP gateway – in production
- **Nov 2008 – Jan 2009:** Collaboration for the design and realization of a security mechanism for distributed control applications, European Project CHAT INFISO-ICT-224428 , University of Trento, Italy.
- **Jan 2008:** Collaboration within the European Project INTEREST IST-33661, Evidence s.r.l., Pisa (Italy).
- **Oct 2007:** Collaboration for “Development of the RT-Druid tool”, Evidence s.r.l., Pisa (Italy).
- **Jan 2007:** Collaboration for the “Requirements analysis of the RT-Druid tool”, Evidence s.r.l., Pisa (Italy).
- **Oct 2004 – Jan 2005:** Collaboration within the OCERA FP5 European Research Project IST-2001-35102, SSSA.
- **May – Aug 2005:** Collaboration on “Performance analysis techniques for control systems with computing resources constraints”, European Project RECSYS IST-2001-37170, SSSA.
- **Feb – Mar 2005:** Collaboration within the OCERA FP5 European Research Project IST-2001-35102, SSSA.
- **May – Jun 2004:** Collaboration on Experimentation on Embedded platforms for Multimedia Applications, SSSA.
- **Jan – Apr 2004:** Collaboration to the activities of the FABRIC Research Project IST-2001-37167, SSSA.
- **Jul – Dec 2003:** Collaboration to the activities of the European Research Project ARTIST IST-2001-34820, SSSA.
- **Jun – Jul 2003:** Collaboration for using digital signatures in internal processes, Link Research Project, SSSA.
- **Jul – Aug 2002:** Collaboration on “Support for experimenting with digital signatures in the internal processes”, Project Link “Piano di Potenziamento della Rete di Ricerca e di Sviluppo nel Territorio”, SSSA.
- **Oct 2001:** Technological evaluation of an investment proposal within the “Startech Sviluppo Italia” Program, on the issue of verifying printed digital signatures, Technodeal s.r.l., Pisa (Italy).

- ❑ **Aug – Oct 2001:** *Internship in SCHLUMBERGER SMART CARDS, AUSTIN (TX):* Design and implementation of an open-source middleware for smart cards. Software currently available in most Linux distributions.
- ❑ **Jan – Jun 2001:** Design of an advanced document object model for a *digital library* and implementation within the *Dienst* software by means of the *OLP Protocol*. Project developed in collaboration with “Consorzio Nazionale delle Ricerche, Istituto di Elaborazione dell'Informazione / CNR-IEI”.
- ❑ **Mar – Apr 2001:** Design and realization of a web-based *content management framework* for sharing digital documents. Implemented within the *Zope* application server. Currently online at <http://link.sssup.it>.
- ❑ **Jul – Sep 2001:** Design of a web-based *Electronic Registry System* compliant with the Italian national laws and implementation within the *Zope application server*. Project committed to SSSA by the Authority for Information Technologies in Public Administrations (AIPA).
- ❑ **Jul – Dec 2000:** Realization of a software tool for digital signatures, within the “Project for electronic document security and digital signatures”, SSSA.

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#### **PhD and MSc students I acted as supervisor, examiner or defense opponent for**

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- ❑ **Sep 2019 to date:** supervisor of Gabriele Ara for his PhD in Emerging Digital Technologies at Scuola Sant’Anna, focusing on power-aware real-time scheduling on heterogeneous platforms
- ❑ **Sep 2018 to date:** supervisor of Agostino Mascitti for his PhD in Emerging Digital Technologies at Scuola Sant’Anna, focusing on power-aware real-time scheduling on heterogeneous platforms
- ❑ **2017 to date:** co-supervisor of Daniel Bristot de Oliveira for his joint PhD at Scuola Sant’Anna and Universidad Federal de Santa Catarina, focusing on automata-based run-time verification of the Linux kernel
- ❑ **Sep 2017 – Feb 2018:** supervisor of Francesco de Gioia for a MSc thesis at University of Pisa, focusing on “testing in development tool-chains for RISC-V architectures,” carried out as an internship at Gaisler Research (Sweden)
- ❑ **Jul 2017 to 2018:** supervisor of Alessio Balsini for his PhD in Emerging Digital Technologies at Scuola Sant’Anna, focusing on heterogeneous and power-aware real-time scheduling in the Linux kernel
- ❑ **Nov 2016 to 2017:** supervisor of Federico Civerchia in his PhD in Emerging Digital Technologies at Scuola Sant’Anna, focusing on Internet of Things
- ❑ **Mar – Jun 2014:** supervisor of Andrea Meroni during his internship at Bell Labs Ireland about “On-Demand State Migration Protocol for Elastic IMS Cloud Components”, work submitted as MSc thesis at University of Pavia (Italy)
- ❑ **2010-2016:** co-tutor of Juri Lelli for the PhD in Computer Engineering about “Multiprocessor Real-Time Scheduling on General Purpose Operating Systems” at Scuola Superiore Sant’Anna, Pisa (Italy)
- ❑ **Feb – May 2013:** supervisor of Aram Santogidis during his internship at Bell Labs Ireland about “Simulation of Real-Time Cloud Computing Applications”
- ❑ **Jul – Sep 2012:** supervisor of Nilo Redini during his internship at Bell Labs Ireland about “Access control models for a novel Internet-scale file-system”, project submitted as MSc thesis at University of Pisa (Italy)
- ❑ **Jun 2012:** external opponent of Mikael Åsberg for the licensiate thesis defense in Comp. Science and Engineering on “Development of Hierarchical Real-Time Systems” at the Mälardalen University, Västerås (Sweden)
- ❑ **2006-2010:** co-tutor of Fabio Checconi for the PhD in Computer Engineering on “Proportional Share Scheduling in General Purpose Operating Systems: Theory and Practice” at Scuola Superiore Sant’Anna, Pisa (Italy)
- ❑ **2008-2011:** supervisor of Gaetano Anastasi for the PhD in Computer Engineering focusing on “Quality of Service Management in Service Oriented Architectures” at Scuola Superiore Sant’Anna, Pisa (Italy)
- ❑ **2011:** external examiner for the Degree of Master of Information Systems and Technology by Research of Zhe Sun, with a thesis on “Research on a New Peer to Cloud and Peer Model and a Deduplication Storage System” at the University of Wollongong
- ❑ **2010:** supervisor of Giacomo Bagnoli for the MSc thesis in Computer Engineering on “Design and development of a mechanism for low-latency real time audio processing on Linux” at the University of Pisa (Italy)
- ❑ **2009:** supervisor of Andrea Angella for the MSc thesis in Computer Engineering on “SCOTT: un’architettura modulare per il testing di soluzioni basate su smartcard ” at the University of Pisa (Italy)
- ❑ **2009:** supervisor of Emanuele Gringeri for the MSc thesis in Computer Engineering on “Improving security and memory management in the MUSCLE card framework ” at the University of Pisa (Italy)
- ❑ **2008:** supervisor of Alberto Donadoni for the MSc thesis in Computer Engineering on “Progetto e realizzazione di un’architettura software modulare ed estendibile per il monitoraggio e la gestione dei parametri di esecuzione di applicazioni soft real-time” at the University of Pisa (Italy)

- **2006:** supervisor of Riccardo Bresciani for the BSc thesis in Computer Engineering on “Crittografia a Curve Ellittiche su FPGA Altera Cyclone II” at the Scuola Superiore Sant’Anna, Pisa (Italy)
- **2003:** supervisor of Alessandro Pieroni for the MSc thesis in Computer Engineering on “Realizzazione di un’API crittografica per smart-card in Java” at the University of Pisa (Italy)
- **2003-2004:** co-tutor of Riccardo Brigo for the PhD in Computer Engineering on Fingerprint Matching on Programmable Smart-Cards at Scuola Superiore Sant’Anna, Pisa (Italy)
- **2002:** supervisor of Riccardo Brigo for the MSc thesis in Computer Engineering on “Sviluppo di un sistema di protezione per smart-card basato su algoritmi di verifica biometrica on-board” at the University of Pisa
- **2002:** supervisor of Paolo Grimaccia and Matteo Ferrari for the MSc thesis in Computer Engineering on “Progetto e realizzazione di un emulatore Java Card” at the University of Pisa (Italy)

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### Teaching experience

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- **Yearly, from a.y. 2016/17 to date:** Courses on “Cloud Computing and Big-Data” and “Cloud Computing and Big-Data Lab” in the PhD in Emerging Digital Technologies at Scuola Superiore Sant’Anna, the PhD in Data Science at Scuola Normale Superiore of Pisa, and the Nation-wide International PhD in Artificial Intelligence at University of Pisa
- **a.y. 2021/22:** Real-Time and High-Performance Computing on Linux, PhD in Emerging Digital Technologies at Scuola Superiore Sant’Anna
- **a.y. 2021/22:** Java Programming Fundamentals, Course for Honor Students at Scuola Superiore Sant’Anna
- **a.y. 2020/21:** Computer Security, Course for Honor Students at Scuola Superiore Sant’Anna
- **a.y. 2020/21:** Advanced Java Programming, Course for Honor Students at Scuola Superiore Sant’Anna
- **a.y. 2020/21:** C/C++ Programming Foundations, Course for Honor Students at Scuola Superiore Sant’Anna
- **Yearly, from a.y. 2016/17 to 2019/20:** Course on “Component-Based Software Design,” MSc degree in Embedded Computing Systems jointly organized by Scuola Sant’Anna and University of Pisa. Course language: English
- **March 2016:** Course “From Classical Distributed Systems to Cloud Computing” - external lecturer for PhD students at the Computer Engineering Dept. of University of Pisa. Course Language: English
- **Yearly, from 2006 to 2011:** Course on “Design of Embedded System”, Faculty of Engineering, University of Siena
- **Yearly, from 2002 to 2011:** International Master on Information Technology and Software Engineering – Module “*System Security and Cryptography*”, SSSA. Course language: English.
- **Yearly, from 2006 to 2011:** International Master on Communication Networks Engineering – Module “*System Security and Cryptography*”, SSSA. Course language: English.
- **Jun 2008:** Course on “Real-time operating systems”, SSSA “UNI-NORGE Project”, Ericsson, Rome.
- **Jun 2006:** Lecture on “Digital Signatures: *technological and juridical framework*”, Specialization course “*Codice dell’Amministrazione Digitale D. Lgs. n.82/2005*”, LiderLab, SSSA.
- **Mar 2006:** Lecture on “Technologies for e-Health Security”, Master on European Procurement and Transplantation Programs Management, SSSA
- **Nov 2005:** Lecture on “Informatics Basics”, Master on Innovation Management, SSSA
- **Oct – Nov 2005:** International Master on Information Technology and Communication Networks Engineering – Module “Java”, SSSA. Course language: English
- **Oct 2005 – Sep 2006:** Course on Industrial Informatics, Faculty of Engineering, University of Siena.
- **Oct – Dec 2005:** Professor assistant for a course on “Java Programming”, Faculty of Engineering, Pisa University.
- **Oct – Nov 2005:** Course on “Computer Architectures I”, Faculty of Engineering, University of Siena.
- **Oct 2005:** Specialization course “*Codice dell’Amministrazione Digitale D. Lgs. n.82/2005*” -- Lecture on “*Digital Signature: a technological viewpoint*”, LiderLab, SSSA.
- **May – Jul 2005:** Course on Industrial Informatics, Faculty of Engineering, University of Siena.
- **Apr 2004:** Course on “*e-commerce: technological issues related to authentication, security and privacy*” within the 2004 Edition of the Specialization Course “*Marketing e Distribuzione di Prodotti Assicurativi*”, SSSA.
- **Oct – Dec 2004:** Professor assistant for a course on “Informatics”, Faculty of Engineering, Pisa University.
- **Feb – May 2004:** Professor assistant for a course on “Informatics”, Faculty of Engineering, Pisa University.
- **Apr – May 2001:** Specialization course “*The Electronic Registry: specialistic knowledge for experts*”, SSSA.
- **May 2001:** Seminar “*Technologies for innovating the Public Administration – Technologies and tools for ICT security*”, SSSA.

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## Education

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- **Jan 2001 – Jul 2004:** PhD in Computer Engineering, Scuola Superiore Sant'Anna University, Pisa (Italy), with *maximum marks* (“100/100 *summa cum laude*”). PhD research title: “*Workflow and digital signature systems for Public Administration and enterprises*”.
- **Sep 1992 – May 2000:** Master Degree in Computer Engineering (“Laurea in Ingegneria Informatica”), University of Pisa (Italy) with *maximum marks* (“110/110 *summa cum laude*”).
- **Sep 1988 – Jun 1992:** Senior High School specializing in Science Education.

### POST-DEGREE STUDIES

- **June 2004 – May 2005:** **Research assistant** at the Real-Time Systems Laboratory (RETIS) of SSSA, for research activities in the European Project ARTIST
- **July 2001:** 13<sup>th</sup> International School for Computer Science Researchers “Foundations of Wide Area Network Programming”, Lipari, Messina (Italy).
- **Aug 2001:** Course on “Technologies and Innovation for improving the Public Administration internal processes”, modules “Digital signature systems” and “Organizational models for the PA innovations”, SSSA.
- **Nov 2002 – Jan 2003:** Course on “Management of internal innovation and external development processes” (with a module about “Team interaction and project management skills”), SSSA.

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## Patents

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1. **T. Cucinotta**, E. Jul. “*Load-balancing and scaling of cloud resources by migrating a data session*,” Patent Grant EP3046028B1, February 19th 2020 (application EP15305031 January 15th 2015).
2. **T. Cucinotta**. “*Method of preventing access to sensitive data of a computing device*,” US Patent **Grant** US10410004B2, Sep 10th, 2019 (application EP20130305396, March 28th, 2013).
3. E. Jul, **T. Cucinotta**, D. Cherubini. “*Secure Data Processing*,” EU Patent **Grant** EP2827276B1, July 3rd, 2019 (application EP20130306038, July 2013).
4. **T. Cucinotta**, S. Betgé-Brezetz. “*Method and system for controlling the exchange of Privacy-Sensitive Information*,” US Patent **Grant** US10237057B2, March 2019 (application EP20130360029, September 2013).
5. **T. Cucinotta**, M. Karnstedt. “*Method for Performing Load Balancing, Distributed Computing Environment and Computer Program Product*,” EU Patent Grant EP2940580B1, March 28th, 2018 (application EP20140305650, April 30th, 2014)
6. E. Jul, D. Cherubini, **T. Cucinotta**, D. Lugones. “*Method for Balancing a Load, a System, an Elasticity Manager and a Computer Program Product*,” US Patent **Grant** US9891941B2, February 2018 (application EP20140306301, October 2014).
7. **T. Cucinotta**, F. Chang, R. Viswanathan. “*Exploiting Probabilistic Latency Expressions For Placing Cloud Applications*,” US Patent **Grant** US9722930 B2, August 2017 (application 14/075727, November 2013).
8. **T. Cucinotta**, D. Cherubini, E. Jul. “*Apparatus and method for secure data processing*.” EU Patent **Grant** EP2672673B1, May 2016 (application 20120360045, June 2012).

### FILED PATENTS

1. H. Gustafsson, L. Abeni, J. Eker, **T. Cucinotta**, R. Mini. “*Methods and Systems for Fault Mitigation with Additional State Transitions in Cloud Systems*,” Filed Patent PCT/IB2023/057199, July 13th 2023
2. **T. Cucinotta**, M. Vannucci, A. Ritacco, G. Lanciano, A. Artale, J. Barata, E. Sposato. “*Metodo per identificare e classificare le modalità comportamentali di una pluralità di dati relativi ad un'infrastruttura telefonica per la network function virtualization*,” Filed IT Patent 102019000014241, August 2019. Extensions: EP3772833A1, February 2021.
3. **T. Cucinotta**, M. Vannucci, A. Ritacco, G. Lanciano, A. Artale, J. Barata, E. Sposato. “*Metodo per predire l'evoluzione temporale di una pluralità di dati relativi ad un'infrastruttura telefonica per la network function virtualization*,” Filed IT Patent 102019000014262, August 2019. Extensions: EP3772834A1, February 2021.
4. **T. Cucinotta**, M. Vannucci, G. Lanciano, F. Galli, F. Brau, A. Artale, E. Sposato, L. N. P. Jorge. “*Metodo per la gestione di risorse di un'infrastruttura per la network function virtualization*,” Filed Patent IT102020000031034, December 16th 2020. Extensions:
5. **T. Cucinotta**, A. Derstepanians, M. Vannucci, A. Artale, S. Fichera, S. Lahiri, K. S. Avhad. “*Metodo per rilevare anomalie in un'infrastruttura per la network function virtualization*,” Filed IT Patent 102023000006180, March 2023.

6. **T. Cucinotta**, D. Cherubini, E. Jul. "Secure Data Processing," Filed US Patent 14/405894. December 2014.
7. **T. Cucinotta**, D. Cherubini, E. Jul. "Secure Data Processing," Filed US Patent 14/399372. November 2014.
8. **T. Cucinotta**, A. Meroni, V. Hilt. "State Migration for Elastic Virtualized Components," Filed US Patent 14/338502. July 2014.
9. **T. Cucinotta**. "Method for Managing User Requests in a Distributed Computing Environment and Computer Program Product," Filed EU Patent 14305652. April 2014.
10. **T. Cucinotta**. "Method For Virtual Machine Instantiation, Scalable Computing System, Virtual Machine And Computer Program Product," Filed EU Patent 14305558. April 2014.
11. **T. Cucinotta**, I. Bedini. "Method, Processing Framework, Aggregator And Computer Program Product For Processing Data," Filed EU Patent 13360033. October 2013.
12. **T. Cucinotta**. "Method and System for Graphical User Interface Layout Generation, Computer Program Product," Filed EU Patent 13360015. August 2013.
13. **T. Cucinotta**, A. Sala. "Methods and Devices for Protecting Private Data," Filed US Patent 13/944964. July 2013.
14. **T. Cucinotta**, "Methods and Devices for Controlling Access to Distributed Resources," Filed US Patent 13/926832. June 2013.
15. **T. Cucinotta**, I. Bedini. "Method for Data Processing, Element to Process Data, Method for Monitoring Activity and Computer Program Product," Filed EU Patent 13360010. May 2013.
16. **T. Cucinotta**. "Scheduling," Filed EU Patent 20130305397. March 2013.
17. I. Bedini, **T. Cucinotta**, A. Sala, B. Theeten. "Systems And Methods For Self-Adaptive Distributed Systems," Filed US Patent 13/853533. March 2013.
18. **T. Cucinotta**, D. Cherubini, E. Jul. "Collaborative Uses of a Cloud Computing Confidential Domain of Execution," Filed US Patent 13/622007. September 2012.
19. D. Cherubini, **T. Cucinotta**. "System Control," Filed EU Patent 20120360068. September 2012, and Filed US Patent 14/423967
20. **T. Cucinotta**, D. Cherubini, E. Jul. "Secure Data Processing." Filed EU Patent 20120360044. June 2012
21. **T. Cucinotta**, "Task Scheduling." Filed EU Patent 20120360037. May 2012

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## Publications

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### ARTICLES IN INTERNATIONAL PEER-REVIEWED SCIENTIFIC JOURNALS

1. F. Galli, K. Jung, S. Biswas, C. Palamidessi, **T. Cucinotta**. "Advancing Personalized Federated Learning: Group Privacy, Fairness, and Beyond," Springer Nature Computer Science, September 2023
2. G. Lanciano, R. Andreoli, **T. Cucinotta**, D. Bacciu, A. Passarella. "A 2-phase Strategy For Intelligent Cloud Operations," IEEE Access, September 2023
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7. **T. Cucinotta**, L. Abeni., M. Marinoni, R. Mancini and C. Vitucci. "Strong Temporal Isolation among Containers in OpenStack for NFV Services," IEEE Transactions on Cloud Computing, September 2021
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ARTICLES IN PROCEEDINGS OF INTERNATIONAL PEER-REVIEWED CONFERENCES AND WORKSHOPS

1. R. Andreoli, H. Gustafsson, L. Abeni, R. Mini, **T. Cucinotta**. "*Optimal Deployment of Cloud-native Applications with Fault-Tolerance and Time-Critical End-to-End Constraints*," (to appear) in Proceedings of the 16th IEEE/ACM International Conference on Cloud Computing (IEEE/ACM UCC 2023), December 4-7th, 2023, Taormina (Messina), Italy.
2. R. Andreoli, **T. Cucinotta**. "*Inducing Huge Tail Latency on a MongoDB deployment*," in Proceedings of the 11th IEEE International Conference on Cloud Engineering (IC2E 2023), September 25-28, 2023, Boston, Massachusetts, USA.
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12. F. Galli, S. Biswas, K. Jung, **T. Cucinotta**, C. Palamidessi. "*Group Privacy for Personalized Federated Learning*," in Proceedings of the 9th International Conference on Information Systems Security and Privacy (ICISSP 2023), February 22-24, 2023, Lisbon, Portugal
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64. K. Konstanteli, **T. Cucinotta**, K. Psychas, T. Varvarigou. "*Admission Control for Elastic Cloud Services*," in Proceedings of the 5th IEEE International Conference on Cloud Computing (IEEE CLOUD 2012), Honolulu, Hawaii, USA, June 2012
65. K. Konstanteli, **T. Cucinotta**, T. Varvarigou. "*Probabilistic Admission Control for Elastic Cloud Computing*," in Proceedings of the IEEE International Conference on Service-Oriented Computing and Applications (SOCA 2011), Irvine, CA, December 2011
66. **T. Cucinotta**, G. Anastasi. "*A Heuristic for Optimum Allocation of Real-Time Service Workflows*," in Proceedings of the IEEE International Conference on Service-Oriented Computing and Applications (SOCA 2011), Irvine, CA, December 2011
67. L. Abeni and **T. Cucinotta**, "*Efficient Virtualisation of Real-Time Activities*," in Proceedings of the IEEE International Workshop on Real-Time Service-Oriented Architecture and Applications (RTSOAA 2011), December 12-14 2011, Irvine, CA
68. G. F. Anastasi, **T. Cucinotta**, G. Lipari, M. Garcia-Valls, "*A QoS Registry for Adaptive Real-Time Service-Oriented Applications*," in Proceedings of the IEEE International Workshop on Real-Time Service-Oriented Architecture and Applications (RTSOAA 2011), December 12-14 2011, Irvine, CA
69. **T. Cucinotta** and V. Subramanian. "*Characterization and analysis of pipelined applications on the Intel SCC*," 4th MARC Symposium, Potsdam, Germany, December 2011
70. **T. Cucinotta**. "*Optimum Scalability Point for Parallelisable Real-Time Components*," in Proceedings of the International Workshop on Synthesis and Optimization Methods for Real-time and Embedded Systems (SOMRES 2011), co-located with the 32nd IEEE Real-Time Systems Symposium (RTSS 2011), Vienna, Austria, November 29 - December, 2011
71. **T. Cucinotta**, S. Gogouvitis, K. Konstanteli. "*SLAs in Virtualized Cloud Computing Infrastructures with QoS Assurance*," in Proceedings of the International Workshop on eContracting in the Clouds, co-located with the eChallenges 2011 Conference, Florence, Italy, October 2011

72. **T. Cucinotta**, F. Checconi, D. Giani, "Improving Responsiveness for Virtualized Networking Under Intensive Computing Workloads," in Proceedings of the 13<sup>th</sup> Real-Time Linux Workshop (RTLWS 2011), Prague, Czech Republic, October 2011
73. J. Lelli, G. Lipari, D. Faggioli, **T. Cucinotta**, "An efficient and scalable implementation of global EDF in Linux," in Proc. of the 7<sup>th</sup> International Workshop on Operating Systems Platforms for Embedded Real-Time Applications (OSPERT 2011), Porto, Portugal, July 2011
74. **T. Cucinotta**, D. Faggioli, G. Bagnoli, "Low-Latency Audio on Linux by Means of Real-Time Scheduling," in Proceedings of the Linux Audio Conference (LAC 2011), Maynooth, Ireland, May 2011
75. S. Kumar, **T. Cucinotta**, G. Lipari, "A Latency Simulator for Many-core Systems," in Proceedings of the 44th Annual Simulation Symposium (ANSS 2011), part of the Spring Simulation Multiconference (SpringSim'11), Boston, USA, April 2011
76. **T. Cucinotta**, F. Checconi, G. Kousiouris, D. Kyriazis, T. Varvarigou, A. Mazzetti, Z. Zlatev, J. Papay, M. Boniface, S. Berger, D. Lamp, T. Voith, M. Stein, "Virtualised e-Learning with Real-Time Guarantees on the IRMOS Platform," in Proceedings of the IEEE International Conference on Service-Oriented Computing and Applications (SOCA 2010), Perth, Australia, December 2010. **Best Paper Award**
77. D. Kyriazis, A. Menychtas, G. Kousiouris, K. Oberle, T. Voith, M. Boniface, E. Oliveros, **T. Cucinotta**, S. Berger, "A Real-time Service Oriented Infrastructure," Proceedings of the Annual International Conference on Real-Time and Embedded Systems (RTES 2010), Singapore, November 2010
78. **T. Cucinotta**, D. Giani, D. Faggioli, F. Checconi, "Effective Real-Time Computing on Linux," in Proceedings of the 12<sup>th</sup> Real-Time Linux Workshop (RTLWS 2010), Nairobi, Kenya, October 2010
79. **T. Cucinotta**, D. Giani, D. Faggioli and Fabio Checconi, "Providing Performance Guarantees to Virtual Machines using Real-Time Scheduling," in Proceedings of the 5<sup>th</sup> Workshop on Virtualization and High-Performance Cloud Computing (VHPC 2010), Ischia (Naples), Italy, August 2010
80. **T. Cucinotta**, D. Faggioli, "An Exception Based Approach to Timing Constraints Violations in Real-Time and Multimedia Applications," in Proceedings of the IEEE Symposium on Industrial Embedded Systems (SIES 2010), Trento, Italy, July 2010
81. D. Faggioli, G. Lipari, **T. Cucinotta**, "The Multiprocessor BandWidth Inheritance Protocol," in Proceedings of the 22<sup>nd</sup> Euromicro Conference on Real-Time Systems (ECRTS 2010), Bruxelles, Belgium, July 2010
82. **T. Cucinotta**, F. Checconi, L. Abeni, L. Palopoli, "Self-tuning Schedulers for Legacy Real-Time Applications," in Proceedings of the 5<sup>th</sup> ACM European Conference on Computer Systems (EuroSys 2010), Paris, France, April 2010
83. **T. Cucinotta**, Konstanteli K., Varvarigou T., "Advance Reservations for Distributed Real-Time Workflows with Probabilistic Service Guarantees," in Proceedings of the IEEE International Conference on Service-Oriented Computing and Applications (SOCA 2009), Taipei, Taiwan, December 2009
84. **T. Cucinotta**, L. Abeni, L. Palopoli, F. Checconi, "The Wizard of OS: a Heartbeat for Legacy Multimedia Applications," in Proceedings of the 7<sup>th</sup> IEEE Workshop on Embedded Systems for Real-Time Multimedia (ESTIMedia 2009), Grenoble, October 2009
85. **T. Cucinotta**, G. Lipari, L. Palopoli, L. Abeni, Santos R., "Multi-level feedback control for Quality of Service Management," in Proc. of the 14<sup>th</sup> IEEE International Conference on Emerging Technologies and Factory Automation, Palma de Mallorca (ETFA 2009), Spain, September 2009
86. F. Checconi, **T. Cucinotta**, M. Stein, "Real-Time Issues in Live Migration of Virtual Machines," in Proceedings of the 4<sup>th</sup> Workshop on Virtualization and High-Performance Cloud Computing (VHPC 2009), Delft, The Netherlands, August 2009
87. **T. Cucinotta**, G. Anastasi, L. Abeni, "Respecting temporal constraints in virtualised services," in Proc. of the 2<sup>nd</sup> IEEE International Workshop on Real-Time Service-Oriented Architecture and Applications (RTSOAA 2009), Seattle, Washington, July 2009
88. K. Konstanteli, D. Kyriazis, T. Varvarigou, **T. Cucinotta**, G. Anastasi, "Real-time guarantees in flexible advance reservations," in Proc. of the 2<sup>nd</sup> IEEE International Workshop on Real-Time Service-Oriented Architecture and Applications (RTSOAA 2009), Seattle, Washington, July 2009

89. F. Checconi, **T. Cucinotta**, D. Faggioli, G. Lipari, "*Hierarchical Multiprocessor CPU Reservations for the Linux Kernel*," in Proc. of the 5<sup>th</sup> International Workshop on Operating Systems Platforms for Embedded Real-Time Applications (OSPERT 2009), Dublin, Ireland, June 2009
90. **T. Cucinotta**, D. Faggioli, A. Evangelista, "*Exception-Based Management of Timing Constraints Violations for Soft Real-Time Applications*," in Proc. of the 5<sup>th</sup> International Workshop on Operating Systems Platforms for Embedded Real-Time Applications (OSPERT 2009), Dublin, Ireland, June 2009
91. **T. Cucinotta**, G. Anastasi, L. Abeni, "*Real-Time Virtual Machines*," in Proc. of the 29th Real-Time System Symposium (RTSS 2008) – Work in Progress Session, Barcelona, December 2008
92. **T. Cucinotta**, L. Abeni, S. K. Baruah, G. Lipari, L. Palopoli, "*Weighted Feedback Reclaiming for Multimedia Applications*", in Proc. of the 6<sup>th</sup> IEEE Workshop on Embedded Systems for Real-Time Multimedia (ESTIMedia 2008), Atlanta, Georgia, United States, October 2008
93. **T. Cucinotta**, D. Faggioli, G. Lipari, "*An Efficient Implementation of the BandWidth Inheritance Protocol for Handling Hard and Soft Real-Time Applications in the Linux Kernel*", in Proc. of the Fourth International Workshop on Operating Systems Platforms for Embedded Real-Time Applications (OSPERT 2008), Prague, Czech Republic, July, 2008
94. **T. Cucinotta**, "*Access Control for Adaptive Reservations on Multi-User Systems*", in Proc. of the 14<sup>th</sup> IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS 2008), St. Louis (MO), USA, April 2008
95. **T. Cucinotta**, L. Palopoli, "*Feedback scheduling for pipelines of tasks*", in Proc. of the 10<sup>th</sup> International Conference on Hybrid Systems: Computation and Control (HSCC 2007), Pisa, Italy, April 2007
96. **T. Cucinotta**, L. Palopoli, L. Marzario, A. Mancina, P. Valente, "*A unified framework for managing different resources with QoS guarantees*", in Proc. of the 1<sup>st</sup> International Workshop on Operating System Platforms for Embedded Real-Time Applications (OSPERT 2005), Palma de Mallorca, Balearic Islands, Spain, July 2005
97. **T. Cucinotta**, M. Di Natale, D. Corcoran, "*Breaking down architectural gaps in smart-card middleware design*", in Proc. of the 1<sup>st</sup> International Conference on Trust and Privacy in Digital Business (TrustBus '04), Zaragoza (Spain), September 2004
98. **T. Cucinotta**, Brigo R., M. Di Natale, "*Hybrid fingerprint matching on programmable smart cards*", in Proc. of the 1<sup>st</sup> International Conference on Trust and Privacy in Digital Business (TrustBus '04), Zaragoza (Spain), September 2004
99. **T. Cucinotta**, D. Corcoran, M. Di Natale, "*A protocol for programmable smart cards*", Trust and Privacy in Digital Business Workshop, Prague, Czech Republic. In Proc. of the 14<sup>th</sup> International Workshop on Database and Expert Systems Applications (DEXA 2003), September 2003.
100. **T. Cucinotta**, M. Di Natale, S. Kolachalam, "*A Modular Open Source Architecture for ICT Services in the Public Administration*", in Proc. of the 2<sup>nd</sup> EGOV Conference, Prague, Czech Republic, Lecture Notes in Computer Science Series, Vol. 2739, September 2003
101. **T. Cucinotta**, G. Cecchetti, G. Ferraro, "*Adopting redundancy techniques for multicast stream authentication*", in Proc. of the 9<sup>th</sup> IEEE Workshop on Future Trends of Distributed Computing Systems (FTDCS 2003), Puerto Rico, May 2003. IEEE Computer Society
102. **T. Cucinotta**, L. Palopoli, L. Marzario, G. Lipari, L. Abeni, "*Adaptive reservations in a Linux environment*", in Proc. of the 10<sup>th</sup> IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS 2004), Toronto, Canada, May 2004
103. **T. Cucinotta**, L. Palopoli, L. Marzario, "*Stochastic feedback-based control of QoS in soft real-time systems*", in Proceedings of the 43<sup>rd</sup> IEEE Conference on Decision and Control (CDC 2004), Bahamas, December 2004
104. L. Palopoli, **T. Cucinotta**, A. Bicchi, "*Quality of service control for soft real-time applications*", in Proc. of the 42<sup>nd</sup> IEEE Conference on Decision and Control (CDC 2003), Hawaii, USA, Dec. 2003

ARTICLES IN PROCEEDINGS OF ITALIAN PEER-REVIEWED CONFERENCES AND WORKSHOPS

105. M. Di Natale, **T. Cucinotta**, P. Ancilotti, "*Lo sviluppo di una architettura modulare open-source per i servizi della PA: considerazioni tecniche e organizzative*", in proceedings of SALPA: Sapere Aperto e Libero nella Pubblica Amministrazione, Marzo 2004, Pisa

BOOK CHAPTERS

1. **T. Cucinotta**. "Cybersecurity (in Distributed Computing Systems)," Encyclopedia of Law and Data Science, pp. 92-97, ed. G. Comandé, Edward Elgar Publishing, February 2022. ISBN: 978-1-83910-458-9
2. L. Schubert L., S. Wesner, D. R. Bonilla, **T. Cucinotta**. "Autonomic Distribution and Adaptation," Programming Multi-core and Many-Core Computing Systems. Wiley Interscience. February 2017. ISBN: 978-0-470-93690-0
3. **T. Cucinotta**, G. Lipari, L. Schubert. "Operating System and Scheduling for Future Multi-core and Many-Core Platforms," Programming Multi-core and Many-Core Computing Systems. Wiley Interscience. February 2017. ISBN: 978-0-470-93690-0
4. S. V. Gogouvitis, K. G. Konstanteli, D. P. Kyriazis, G. Katsaros, **T. Cucinotta**, M. Boniface. "Workflow management systems in distributed environments," Enterprise Resource Planning: Concepts, Methodologies, Tools, and Applications, Management Association. Vol. 1-3, pp. 142-159, 2013. IGI Global, Hershey, PA. ISBN: 9781466641549, doi: 10.4018/978-1-4666-4153-2.ch009
5. **T. Cucinotta**, S. V. Gogouvitis. "Real-Time Attributes in Operating Systems," Achieving Real-Time in Distributed Computing: From Grids to Clouds. IGI Global, July 2011. DOI: 10.4018/978-1-60960-827-9
6. G. Katsaros, **T. Cucinotta**. "Programming Interfaces for Realtime and Cloud-based Computing," Achieving Real-Time in Distributed Computing: From Grids to Clouds. IGI Global, July 2011. DOI: 10.4018/978-1-60960-827-9
7. V. S. V. Gogouvitis, K. G. Konstanteli, D. Kyriazis, G. Katsaros, **T. Cucinotta**, M. Boniface. "Workflow Management Systems in Distributed Environments," Achieving Real-Time in Distributed Computing: From Grids to Clouds. IGI Global. July 2011. DOI: 10.4018/978-1-60960-827-9
8. E. Oliveros, **T. Cucinotta**, S. C. Phillips, X. Yang, T. Voith, S. Middleton. "Monitoring and Metering in the Cloud," Achieving Real-Time in Distributed Computing: From Grids to Clouds. IGI Global, July 2011. DOI: 10.4018/978-1-60960-827-9
9. S. Narasimhamurthy, M. Muggeridge, S. Waldschmidt, F. Checconi, **T. Cucinotta**. "Data Storage in Cloud Based Real-Time Environments," Achieving Real-Time in Distributed Computing: From Grids to Clouds. IGI Global, July 2011. DOI: 10.4018/978-1-60960-827-9
10. S. Berger, D. Lamp, M. Stein, T. Voith, **T. Cucinotta**, M. Bertogna. "Execution & Resource Management in QoS-aware Virtualized Infrastructures," Achieving Real-Time in Distributed Computing: From Grids to Clouds. IGI Global, July 2011. DOI: 10.4018/978-1-60960-827-9

#### CHAPTERS IN ITALIAN BOOKS

11. **T. Cucinotta**. "Regolamento UE/679/2016 e soluzioni tecnologiche: un cambio di prospettiva," capitolo all'interno del volume "Manuale per il trattamento dei dati personali," a cura di G. Comandé e G. Malgieri, pp. 123-127, Il Sole 24 Ore, Marzo 2018. ISBN: 9788832491326
12. **T. Cucinotta**. "Privacy nell'era dei big-data e il cittadino «privato»," capitolo all'interno del volume "Manuale per il trattamento dei dati personali," a cura di G. Comandé e G. Malgieri, pp. 127-129, Il Sole 24 Ore, Marzo 2018. ISBN: 9788832491326
13. **T. Cucinotta**, "Firma digitale e lavoro cooperativo: aspetti tecnologici", I nuovi scenari del marketing assicurativo, IRSA, 2004
14. **T. Cucinotta**, "Firma digitale e assicurazioni: aspetti tecnologici", L'economia digitale e il settore assicurativo, DEA Quaderni di Impresa Assicurativa, Giuffrè Editore, 2003

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#### Software development in open-source projects

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- ❑ **2022**: patches to [Gnuplot](#), [adding the cubic root function](#), and fixing a [bug in handling covariance fitting variables](#)
- ❑ **2020-2023**: creator of the [distwalk](#) distributed processing benchmark: <https://github.com/tomcucinotta/distwalk>
- ❑ **2017**: patches to [auto-connect ALSA midi inputs](#), both at start and at [runtime](#), in the fluidsynth software synthesizer
- ❑ **2017**: [bugfix in the real-time meter display](#) code and [speed-up of the audio processing pipeline](#) of MuseScore
- ❑ **2016**: contributed patches to the [mainline Linux kernel](#) to [speed-up heap operations](#) within SCHED\_DEADLINE, [refactor the heap code](#) and [fix a wrap-around bug](#) in deadline comparisons
- ❑ **2007 to date**: active contributor to the LyX open-source project (C++): <http://www.lyx.org>  
Developed advanced format-aware find/replace, XMPP-based chat, external material management, bugfixes
- ❑ **2008-2010**: IRMOS real-time scheduler for the Linux kernel (C): <http://lwn.net/Articles/398470/>  
Contributed to the design of the main scheduler features



- ❑ **2012**: contributed to the MuseScore open-source music notation editor (C++): <http://www.musescore.org/>  
Feature for automatic detection of repeating segments in scores and application of corresponding notation
- ❑ **2011**: contributed to the Jack2 open-source low-latency audio infrastructure (C++): <http://repo.or.cz/w/jack2.git>  
Designed and contributed to the integration of Jack2 with the AQuoSA deadline-based scheduler on Linux
- ❑ **2011**: creator of the MCoreSim network-on-a-chip simulator (OMNeT++): <http://sourceforge.net/projects/mcoresim/>
- ❑ **2010**: contributed to the OWL open-source document management system (PHP)  
Tiny patch for faster access to the external link feature
- ❑ **2009-2012**: Contributed to the RTSim real-time systems simulator (C++): <https://sourceforge.net/projects/rtsim/>
- ❑ **2009-2023**: Creator of the Open Macro Library (OML): <http://oml.sourceforge.net>, <https://github.com/tomcucinotta/oml>
- ❑ **2006-2010**: Adaptive Quality of Service Architecture (AQuoSA) for Linux kernel (C): <http://aquosa.sourceforge.net>
- ❑ **2006-2009**: Creator of the ARSim Adaptive Reservations simulator (C++): <http://gna.org/projects/arsim/>
- ❑ **2001**: MuscleCard, open-source smartcard middleware for Linux (JavaCard/C/C++): <http://www.musclecard.com>
- ❑ **2000-2006**: Creator of SmartSign: <http://smartsign.sourceforge.net>
- ❑ **2000-2001**: Designed/developed open-source registry for Public Administration (Python), in production for 6 years
- ❑ **2000**: Dienst digital library software (Perl): Design and implementation of an advanced document object model

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### Informal university assignments

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- ❑ Semiformal design, using Unified Modeling Language (UML), of a *system for event based emulation of generic digital circuits*.
- ❑ Design and realization, using C++, of a command line *discrete event based emulator* for the PIC16C84 microcontroller.
- ❑ Design and realization, using C, of a simplified *transport level network protocol* (OSI terminology).
- ❑ Implementation, using Matlab, of the *Simplex algorithm* for the resolution of Linear Programming optimization problems.
- ❑ Design and realization, using Visual C++, of a *program for the automatic generation of a web page (HTML/Javascript)* supporting students in the selection of the study plan.

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### Computer science background

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#### RESEARCH TOPICS WITH STATE-OF-THE-ART KNOWLEDGE

- ❑ Scheduling of soft real-time tasks and virtual machines for quality of service control
- ❑ Operating Systems for multi-core and many-core systems
- ❑ Secure processing architectures
- ❑ Protocols and architectures for smart-card interoperability
- ❑ Access control models: Role Based Access Control (RBAC) and its variants, Multi Level Security (MLS)
- ❑ Key management algorithms and protocols for secure data streaming
- ❑ Formal methods: Burrows, Abadi, Needham (BAN) logic of authentication and its variants

#### SECURITY-SPECIFIC STANDARDS, PROTOCOLS, LIBRARIES AND TOOLS

- ❑ PKCS standards, ISO 7816 standards, PCSC Standards, X.509, S/MIME, XML-Signature
- ❑ Secure Socket Layer (SSL) protocol, Secure SHell (SSH) protocol
- ❑ Detailed knowledge of cryptosystems: RSA, DSA, DES, Rijaendel (AES), Elliptic Curve (EC)
- ❑ Biometrics recognition techniques, BioAPI, Biometrika FX2000 and FX3 SDK
- ❑ Microsoft CryptoAPI, Java Security Architecture (JSA) and API, JavaCard-2.x, Open Card Framework (OCF), OpenSSL, OpenSSH, Pretty Good Privacy (PGP), ModSSL for Apache
- ❑ Schlumberger Cyberflex Access Toolkit, CompEd DigitalSign and DigitalSign API

#### EMBEDDED SYSTEMS DEVELOPMENT AND DESIGN

- ❑ Z-World: Rabbit Core Module 3000, Dynamic C
- ❑ Texas Instruments: TMS320C6711, Code Composer Studio
- ❑ Altera: Stratix EP1S40 FPGA, Nios II CPU Core, Quartus II, SOPC Builder, Nios II IDE, ModelSim
- ❑ Verilog Hardware Description Language (Verilog HDL), VHDL

#### PROGRAMMING LANGUAGES & FRAMEWORKS

- ❑ C/C++, Java 1.x and 5.0, Design Patterns, OpenMP, MPI, Storm

- gcc, gcov, gdb, Valgrind, advanced knowledge of GNU make, autotools (autoconf/automake)
- Standard Template Library (STL), Boost library, OpenGL, DirectX
- Assembler Intel 80x86, Assembler Motorola 68000
- Unix Bourne Again Shell (BASH) scripting, Regular Expressions
- Microsoft Visual C++ v5.0, Microsoft Visual Basic, Rational Rose '98, Kdevelop, Eclipse
- Microsoft Windows API, Microsoft Foundation Classes (MFC)
- X Toolkit, Motif, Qt, KDE, Gtk, WxWindows
- JavaScript, JScript, Perl, Php, Python, Visual Basic and VBA, VBScript, Pascal, Basic
- Octave, Gnuplot, Matlab, GLPK, Symphony
- Intel Integrated Performance Primitives (IPP) library, SIP, Metaswitch Clearwater

#### OTHER LANGUAGES

- XML, Dynamic HTML, Cascaded Style Sheets (CSS), LaTeX, Unified Modeling Language (UML) Notation
- Structured Query Language (SQL), CORBA Interface Description Language (IDL)
- Ontology Web Language (OWL), Protégé Ontology Editor

#### OPERATING SYSTEMS

- Linux administration, kernel tuning and hacking (driver and scheduler development). Experienced with Solaris
- Android OS and programming
- Microsoft Windows 95/98/NT/ME/2000/XP, MS DOS

#### VARIOUS

- Z Object Publishing Environment (Zope)
- Microsoft Office (and MS Office Automation), Microsoft Front Page
- Italian law on digital signatures: "Codice [...]" (D. Lgs. 82/2005), "Testo Unico [...]" (DPR 445/2000)
- European Directive 1999/93/CE: "Community Framework for Electronic Signatures"

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#### **Foreign languages**

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- Excellent knowledge of both spoken and written *English*.
- Basic knowledge of *German*.

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#### **Personal interests**

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- Computer Security, Smart Cards, Biometrics Identification
- Hardware architectures for cryptographic accelerators and 3D accelerators
- 3D graphics and rendering engines
- Audio signal processing algorithms, audio signal and voice synthesis and recognition
- Neural networks, Artificial Intelligence, semantics-based computing