# Curriculum Vitae et Studiorum

#### Rocco De Nicola

### Short Biography

De Nicola is a full professor of Computer Science at IMT School for Advanced Studies, Lucca and collaborates with the Gran Sasso Science Institute (GSSI) in L'Aquila where he has coordinated for the first four years the PhD program in Computer Science. De Nicola received the Laurea degree in Computer Science from the University of Pisa (Italy) in 1978 and the PhD degree in Computer Science from the University of Edinburgh (UK) in 1985.

From 1995 till 2011, he has been a full professor at Dipartimento di Sistemi e Informatica of the University of Florence (Italy). From 1990 till 1995, a full professor at the Dipartimento di Scienze dell'Informazione of the University of Rome "La Sapienza" (Italy). Before that, he was a full-time researcher at IEI-CNR in Pisa, worked at Edinburgh University and for Italtel in Milano, and held two research grants from Olivetti Ivrea.

De Nicola has been a visiting professor at Technical Universität of Berlin in 1996, at Ecole Normale Superiere de Paris in 2004 and at Ludwig-Maximilians-Universität in Munich in 2004 and in 2013; he has also been a visiting researcher at Microsoft Research Laboratories in Cambridge (UK) in 1999 and 2003.

### Education

- PhD in Computer Science from Department of Computer Science of University of Edinburgh (UK) May 1985.
- Laurea (magna cum laude) in Scienze dell'Informazione at Pisa University December 1978.

### Working Experiences

- July 2011- today. Full Professor of Computer Science at IMT School for Advanced Studies, Lucca.
- November 1995 June 2011. Full Professor of Computer Science at the University of Florence.
- November 1990 October 1995. Full Professor of Computer Science at University "La Sapienza" in Rome.
- October 1982 October 1990. Researcher at Istituto di Elaborazione dell'Informazione of CNR in Pisa.
- March 1981 September 1983. PhD student at University of Edinburgh.
- May 1980 February 1981. Researcher at ITALTEL in Milan.
- April 1978 April 1980. Grant from Olivetti to work on a joint project with Istituto di Elaborazione dell'Informazione (IEI) at CNR in Pisa.

### Research and its outcomes

De Nicola's research aims at understanding the foundations of distributed computing and at applying the formal techniques based on these foundational studies to the development and the analysis of concurrent distributed systems. Current research concentrates on

- Models and Languages for Open Distributed Systems
- Network Aware Programming
- Service-Oriented Computing
- Specification of Qualitative and Quantitative Properties of Distributed Systems
- Abstract Models for Security and Cryptographic Process Calculi
- Types for Access Control
- Cybersecurity

On these topics, De Nicola collaborates with researchers from many national and international institutions and is the author of more than 200 publications in international refereed journals and conference proceedings. De Nicola has also edited books and special issues of journals. The list of the main research-related publications is reported at the end of this document. Here we report some some important recognitions:

**Titles:** De Nicola has been honored with the title of "Commendatore al Merito della Repubblica Italiana".

Honors: De Nicola is a member of Academia Europaea and a fellow of EATCS.

Citations: De Nicola is one the ISI-Thomson highly cited researchers.

A United States Patent 6751619 "Methods and apparatus for tuple management in data processing system" has been registered with Rocco De Nicola and Antony Rowstron as inventors.

De Nicola is a member of IFIP Working Groups 2.2, 1.6 and 1.8. He is also a member of Gruppo 2003 (an association of leading Italian scientists) and has served in the executive board of the association.

### Teaching

At Florence and/or Rome University, De Nicola has taught: Concurrent Programming, Specification and Analysis of Concurrent Systems, Computer Security, Operating Systems, Algorithms and Data Structures, Computer Architectures, Computability and Formal Languages, Foundations of Programming Languages.

De Nicola has supervised the PhD or master work of several students. Some of them (Luca Aceto, Lorenzo Bettini, Michele Boreale, Flavio Corradini, Daniele Gorla, Michele Loreti, Rosario Pugliese, Roberto Segala, Emilio Tuosto, Francesco Tiezzi) are currently playing an important active role in international research and in Italian or European Universities.

## **Professional Services and Activities**

De Nicola is currently:

• Editor in chief for the Journal of Logical and Algebraic Methods in Programming (Elsevier)

- Member of the editorial board of Mathematical Structures in Computer Science (Cambridge University Press).
- Member of the editorial board of
  - Electronics Proceedings in Theoretical Computer Science.
  - Springer Nature in Computer Science
- Member of the Steering Committee of
  - COORDINATION International Conference on Coordination Models and Languages.
  - DISCOTEC International Federated Conference on Distributed Computing Techniques.
  - SEFM International Conference on Software Engineering and Formal Methods
- Chair of the Steering Committee of ITASEC The Italian Conference on CyberSecurity.
- Member of the "Giunta Amministrativa" of CINI, a consortium of Italian universities for research in Informatics.
- Deputy director of Cyber Security National Lab of CINI.
- Member of Senato Accademico of IMT School
- Coordinator of the Working Group defining the Research Challenges on Cybersecurity for Piano Nazionale della Ricerca 2021-2027.

De Nicola has been

- Member of the advisory board of CITI: The Research Center for Informatics and Information Technologies (Portugal).
- Member of the advisory board of MT-LAB: Modelling of Information Technology (Denmark).
- Coordinator of the PhD Program in Computer Science at Gran Sasso Science Institute (GSSI) in L'Aquila.
- Coordinator of the PhD Program in Computer Science and Applications at IMT.
- Coordinator of the PhD Program in Informatica ed Applicazioni at University of Florence.
- Director of Studies of the Bachelor (Diploma) and Master (laurea) Curriculae in Informatics at University of Florence.
- Deputy Rector for the management of Information System of University of Florence.
- Vice-President of the board of (5) professors leading CSIAF, the center for computerbased services of University of Florence.
- Deputy Director of Dipartimento di Sistemi ed Informatica at University of Florence.
- Vice-president (Coordinator of the Scientific Committee) of GRIN, the association of all researchers in Computer Science at Italian Universities.
- Chairman of the Steering Committees of the International Conference on Coordination Models and Languages.

- Chairman of the Steering Committees of the International Symposium on Trustworthy Global Computing.
- Member of the Consiglio Accademico of IMT.
- Member of the "Consiglio Direttivo" of IMT, Lucca.
- Member of the Consiglio Consortile of CINECA, a consortium of Italian universities for IT services Committees.
- Member of the "Consiglio di Amministrazione" of LUCENSE, a research company in Lucca.

Moreover, De Nicola has served as General Chair of PLI 2001, Conference Chair of PPDP 2001, Program Chair of COORDINATION 2004, TGC 2005 and ESOP 2007, member of the Steering Committee of ETAPS. He has also been a member of the program committee of important international conferences, such as AMAST, CAAP, CONCUR, COORDINATION, FCT, ICALP, LICS, MA, MFCS, PROCOMET, PPDP.

De Nicola has also been *invited speaker* for many international conferences and schools among which IFIP World Congress 1986, COORDINATION 1999, CONCUR 2000, EX-PRESS 2004, FMCO 2004, DAIS-FMOODS 2005, QAPL 2006, FSEN 2019.

#### **Recent Research Project**

De Nicola is or has recently been principal investigator in projects funded by MIUR, CNR, Microsoft and European Union:

- AGILE: Architectures for Mobility 2001-2004 IST FET Global Computing - EU 150.000 Euro (Site Coordinator)
- MIKADO: Models and Calculi for Mobility 2001-2004 IST FET Global Computing - EU 500.000 Euro (Site Coordinator)
- **NAPI:** Network Aware Programming in Italy 2001-2004 Microsoft Research Cambridge 400.000 Euro (Project Leader)
- **NAPOLI:** Network Aware Programming: Objects Languages and Implementations 2002-2003 MIUR Italy 300.000 Euro (National Coordinator)
- SP4: Architetture Software ad Alta Qualità di Servizio per Global Computing su Cooperative Wide Area Networks 2002-2005 Progetto SP4 - CNR 110.000 Euro (Site Coordinator)
- **SENSORIA:** Software Engineering for Service Oriented Architectures 2005-2008 IST FET Global Computing - EU 400.000 Euro (Site Coordinator)
- **PaCo:** Performability-Aware Computing: Logics, Models, and Languages 2008-2010 MIUR Italy 20.000 Euro (Site Coordinator).
- ASCENS: Autonomic Service-Component Ensembles 2010-2014 IST FET Self-Awareness in Autonomic Systems - EU 400.000 Euro (Site Coordinator)
- **CINA:** Compositionality, Interaction, Negotiation, Autonomicity 2013-2016 MIUR - Italy 600.000 Euro (National Coordinator)
- WILIFE: WIreLess and Ict technologies For Emergency management 2013-2016 Regione Toscana Italy 200.000 Euro (Site Coordinator)

- **QUANTICOL:** A Quantitative Approach to Management and Design of Collective and Adaptive Behaviours, EU 400.000 Euro (Site Coordinator) 2013-2017 IST FET Foundations of Collective Adaptive Systems - EU 400.000 Euro (Site Coordinator)
- **IT-MATTERS:** Methods and Tools for Trustworthy Systems 2019-2021 MIUR - Italy 700.000 Euro (National Coordinator)
- **SPARTA:** Re-imagining the way cybersecurity research, innovation, and training are performed in the European Union - 2019-2022 EU 220.000 Euro (Site Coordinator)
- **TOFFEE:** Tools for Fighting Fakes 2019-2022 IMT Internal PAI project 320.000 Euro (Coordinator)

### **Refereed International Journals**

- A. Balestrucci, R. De Nicola, M. Petrocchi, C. Trubiani A behavioural analysis of credulous Twitter users. Online Social Networks and Media 23, 100133, Elsevier 2021.
- R. De Nicola, T. Duong, M. Loreti: Provably correct implementation of the AbC calculus. Sci. Comput. Program. 202: 102567, Elsevier 2021.
- [3] G. Caldarelli, R. De Nicola, F. Del Vigna, M. Petrocchi, F. Saracco The role of bot squads in the political propaganda on Twitter Communications Physics 3 (1), 1-15, Nature 2020.
- [4] Y. Tonga Uriarte, M. Petrocchi, M. L. Catoni, S. Cresci, R. De Nicola, M. Tesconi, R. Brundo Uriarte: Exploring the relation between festivals and host cities on Twitter: a study on the impacts of Lucca Comics & Games. J. Inf. Technol. Tour. 22(4): 625-648, 2020.
- [5] R. De Nicola, A. Maggi, J. Sifakis: The DReAM framework for dynamic reconfigurable architecture modelling: theory and applications. Int. J. Softw. Tools Technol. Transf. 22(4): 437-455, Springer 2020.
- [6] R. De Nicola, S. Jähnichen, M. Wirsing, Rigorous engineering of collective adaptive systems: special section, Int. J. Softw. Tools Technol. Transf. 22(4): 389-397, Springer 2020.
- [7] R. De Nicola, G.L. Ferrari, R. Pugliese, F. Tiezzi: A formal approach to the engineering of domainspecific distributed systems. J. Log. Algebraic Methods Program. 111: 100511, Elsevier 2020.
- [8] Y. Abd Alrahman, R. De Nicola, M. Loreti: Programming interactions in collective adaptive systems by relying on attribute-based communication. Sci. Comput. Program. 192: 102428, Elsevier 2020.
- [9] R. De Nicola, L. Di Stefano, O. Inverso: Multi-agent systems with virtual stigmergy. Science of Computer Programming, Volume 187, February 2020. Elsevier 2020.
- [10] Y. Abd Alrahman, R. De Nicola, M. Loreti: A calculus for collective-adaptive systems and its behavioural theory, Information and Computation, vol. 268, Elsevier 2019.
- [11] R. Brundo Uriarte, R. De Nicola, V. Scoca, F. Tiezzi: Defining and guaranteeing dynamic service levels in clouds In Future Generation Computer Systems, Volume 99, October 2019, Pages 27-40, Elsevier 2019.
- [12] A. Aral, I. Brandic, R. Brundo Uriarte, R. De Nicola, V. Scoca Addressing Application Latency Requirements through Edge Scheduling, J. Grid Comput., vol. 17 (4), pp. 677–698, Elsevier 2019.
- [13] R. De Nicola, L. Di Stefano, O. Inverso, Toward formal models and languages for verifiable multi-robot systems. Frontiers in Robotics and AI, vol. 5, Article 94, FRONTIERS in Robotics and AI 2018.
- [14] R. Brundo Uriarte, R. De Nicola Blockchain-Based Decentralized Cloud/Fog Solutions: Challenges, Opportunities, and Standards. IEEE Communications Standards Magazine, vol. 2, p. 22-28, IEEE 2018.
- [15] R. De Nicola, Tan Duong, O. Inverso, C. Trubiani, AErlang: Empowering Erlang with attribute-based communication, Science of Computer Programming, vol. 168, p. 71-93, Elsevier 2018.
- [16] V. Buravlev, R. De Nicola, C. A. Mezzina, Evaluating the efficiency of Linda implementations, Concurrency and Computation: Practice and Experience, 30(8), Wiley 2018.
- [17] A. Labella, R. De Nicola, Initial Algebra for a System of Right-Linear Functors, Acta Cybernetica, 23 (1), 191–201, 2017.
- [18] M. Bernardo, R. De Nicola, M. Loreti: Revisiting bisimilarity and its modal logic for nondeterministic and probabilistic processes. Acta Informatica 52: 61-106, Springer 2015.
- [19] M. Boreale, R. Bruni, R. De Nicola, M. Loreti. Sessions and Pipelines for Structured Service Programming, *Mathematical Structures in Computer Science*, 25: 666-709, Cambridge University Press, 2015.
- [20] M. Bernardo, R. De Nicola, M. Loreti: Revisiting Trace and Testing Equivalences for Nondeterministic and Probabilistic Processes. Logical Methods in Computer Science 10(1), 2014.
- [21] R. De Nicola, M. Loreti, R. Pugliese, F. Tiezzi A Formal Approach to Autonomic Systems Programming: The SCEL Language. ACM transactions on Autonomous and Adaptive Systems 9(7), ACM 2014.
- [22] M. Bernardo, R. De Nicola, a M. Loreti: Relating strong behavioral equivalences for processes with nondeterminism and probabilities, *Theoretical Computer Science*, 546(1): 63–92, Elsevier 2014.
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- [26] R. De Nicola and D. Gorla and R.R. Hansen and F. Nielson and H. Riis Nielson and C. W. Probst and R. Pugliese, From Flow Logic to static type systems for coordination languages, *Science of Computer Programming*, 75(6): 376-397, Elsevier 2010.
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- [31] R. De Nicola, D. Gorla, and R. Pugliese. Basic observables for a calculus for global computing. Information and Computation, 205(10): 1491-1525, 2007.
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- [61] Rocco De Nicola. Extensional Equivalences for Transition Systems. Acta Informatica, 24(2):211-237, 1987.
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- [63] Rocco De Nicola and Matthew Hennessy. Testing equivalences for processes. Theoretical Computer Science, 34:83–133, 1984.

### **Edited Books**

- R. De Nicola, eva Kuehn, editors. Software Engineering and Formal Methods 14th International Conference, volume 9763 of Lecture Notes in Computer Science, Springer 2016,
- [2] R. De Nicola, and R. Hennicker, editors. Software, Services, and Systems, volume 8950 of Lecture Notes in Computer Science; Springer, 2015.
- [3] M. Bernardo, R. De Nicola, J. Hillston, editors. Formal Methods for the Quantitative Evaluation of Collective Adaptive Systems - 16th International School on Formal Methods for the Design of Computer, Communication, and Software Systems. volume 9700 of Lecture Notes in Computer Science, Springer 2016.
- [4] R. De Nicola, and C. Julien, editors. Proceedings COORDINATION 2013, volume 7890 of Lecture Notes in Computer Science; Springer, 2013.
- [5] P. Degano, R. De Nicola, and J. Meseguer, editors. Concurrency, Graphs and Models, volume 5065 of Lecture Notes in Computer Science; Springer, 2008.
- [6] R. De Nicola, editor. Programming Languages and Systems, 16th European Symposium on Programming, ESOP 2007, Proceedings, volume 4421 of Lecture Notes in Computer Science. Springer, 2007.
- [7] R. De Nicola, D. Sangiorgi, editors. Special issue on "Types in Concurrency". Acta Informatica, volume 42 N. 2-5. Springer, 2005.
- [8] R. De Nicola, D. Sangiorgi, editors. Trustworthy Global Computing, Selected papers of TGC 2005, volume 3705 of Lecture Notes in Computer Science. Springer, 2004.
- R. De Nicola, G.L. Ferrari, and G. Meredith, editors. Coordination Models and Languages, 6th International Conference, COORDINATION 2004, 2004, Proceedings, volume 2949 of Lecture Notes in Computer Science. Springer, 2004.
- [10] R. De Nicola, U. Montanari, editors. Special issue on "Concurrency and Compositionality". Theoretical Computer Science, Volume 96 (1). Elsevier, 1992.

### Invited Contributions to Books or Conference Proceedings

- G. Caldarelli, R. De Nicola, M. Petrocchi, F. Saracco Information spreading and the role of automated accounts on Twitter: Two case studies. In "Democracy and Fake News: Information Manipulation and Post-Truth Politics", S. Giusti and E. Piras (editors), Routledge 2021
- [2] A. Maggi, R. De Nicola, J. Sifakis: A Logic-Inspired Approach to Reconfigurable System Modelling. In "From Reactive Systems to Cyber-Physical Systems" Lecture Notes in Computer Science vol. 11500, pp. 181-20, Springer 2019.
- [3] R. De Nicola, T. Duong, O. Inverso, F. Mazzanti: A Systematic Approach to Programming and Verifying Attribute-Based Communication Systems. In "From Software Engineering to Formal Methods and Tools, and Back", Lecture Notes in Computer Science vol. 11865, pp. 377-396, Springer 2019.

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- [5] M. Andric, R. De Nicola, A. Lluch-Lafuente: Replicating Data for Better Performances in X10. In Semantics, Logics, and Calculi - Essays Dedicated to Hanne Riis Nielson and Flemming Nielson on the Occasion of Their 60th Birthdays Lecture Notes in Computer Science, vol. 9560, pp. 236–251, Springer 2016.
- [6] R. De Nicola C.A. Mezzina, H. Torres Vieira: Global Protocol Implementations via Attribute-Based Communication. Programming Languages with Applications to Biology and Security - Essays Dedicated to Pierpaolo Degano on the Occasion of His 65th Birthday. Lecture Notes in Computer Science, vol. 9465, pp. 219-237, Springer 2015.
- [7] R. De Nicola, R. Hennicker A Homage to Martin Wirsing. In Software, Services, and Systems- Essays Dedicated to Martin Wirsing on the Occasion of His Retirement from the Chair of Programming and Software Engineering vol. 8950 of Lecture Notes in Computer Science p. 1-12, Springer, 2015.
- [8] R. De Nicola, A. Lluch-Lafuente, M. Loreti, A. Morichetta, R. Pugliese, V. Senni, F. Tiezzi: Programming and Verifying Component Ensembles. in *From Programs to Systems. The Systems perspective in Computing, essays in Honor of Joseph Sifakis* Lecture Notes in Computer Science vol. 8415, 69-83, Springer 2014.
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- [11] M. Wirsing, R. De Nicola, M. Hoelzl: Introduction to "Rigorous Engineering of Autonomic Ensembles"-Track Introduction. Proc. ISoLA (1), Lecture Notes in Computer Science Vol. 8802, 96-98. Springer 2014.
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- [14] R. De Nicola Behavioral Equivalences, in *Encyclopedia of Parallel Computing*, Ed. David Padua, Springer 10 pages, 2011.
- [15] M. Bernardo, R. De Nicola and M. Loreti Uniform Labeled Transition Systems for Nondeterministic, Probabilistic, and Stochastic Processes Calculi, *First International Workshop on Process Algebra and Coordination*, volume 60 of *Electronic Proceeding in Theoretical Computer Science* pages 66-75, 2011.
- [16] M. Bernardo, R. De Nicola and M. Loreti Uniform Labeled Transition Systems for Nondeterministic, Probabilistic, and Stochastic Processes, *Trustworthly Global Computing - 5th International Symposium*, *TGC 2010*, volume 6084 of *Lecture Notes in Computer Science* pages 35-56; Springer, 2010.
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- [23] R. De Nicola and M. Loreti. MoMo: A Modal Logic for Reasoning About Mobility, In Frank S. de Boer et al., editors, *Formal Methods for Components and Objects*, number 3657 in LNCS. pages 95–119. Springer, 2005.
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Herewith, I declare that the information provided in this curriculum vitae is true and accurate. I authorise the processing of personal data according the Italian Legislative Decree no. 196/2003 and art. 13 GDPR 679/16.