Curriculum Vitae et Studiorum

Rocco De Nicola

Basic Information

Birth: Calitri(AV) June 26 1954

Citizenship: Italian

Home address: Piazza della Stazione, 22 - I-56125 Pisa (Italy)

Current Position: Full professor at IMT - School for Advanced Studies, Lucca.

Short Biography

Rocco De Nicola, Ph.D. in Computer Science from the University of Edinburgh, is a professor of Computer Science at the IMT School for Advanced Studies Lucca. He has worked for Olivetti, Italtel, the National Research Council (CNR) in Pisa, Sapienza Università di Roma, and Università di Firenze. He has been a visiting professor at Technische Universität Berlin, École Normale Supérieure in Paris, Universitat Politècnica de Catalunya in Barcelona, and Ludwig Maximilian University Muenchen. He has also been a visiting researcher at the Microsoft Research Center in Cambridge, UK.

Currently, De Nicola is the Rector of the IMT School for Advanced Studies Lucca and the President of Gruppo 2003, an association that brings together 120 Italian scientists at the top of the world rankings in the scientific literature according to the Clarivate Highly Cited Researchers List. He is also the deputy director of the CINI National Laboratory for Cybersecurity, the director of the Cybersecurity Competence Center of Tuscany (C3T), and the Coordinator of the National Ph.D. Program in Cybersecurity. In 2005, he was appointed 'Commendatore della Repubblica' (Commander of the Order of Merit of the Italian Republic) by the President of the Republic of Italy, Carlo Azeglio Ciampi.

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, the European Association for Theoretical Computer Science..

Citations: De Nicola is one the ISI-Thomson / Clarivate 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, Yehia Abd Alrahman, 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).
  - 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.
- Deputy director of Cyber Security National Lab of CINI.
- Member of the "Consiglio Scientifico" of LUCENSE, a research company in Lucca.
- Member of the Board of Directors of the SERICS (SEcurity and RIghts In the CyberSpace) Foundation

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 computer-based 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 Senato Accademico of IMT
- Member of the "Consiglio Direttivo" of IMT,
- 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.
- Member of the "Giunta Amministrativa" of CINI, a consortium of Italian universities for research in Informatics.
- Coordinator of the Working Group defining the Research Challenges on Cybersecurity for Piano Nazionale della Ricerca 2021-2027.

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, EXPRESS 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)

SERICS: *SEcurity and RIghts In the CyberSpace* Extended Partnership on Cybersecurity - 2023-2025 IT 1.100.000 Euro (Site Coordinator)

Refereed International Journals

[1] M. Pratelli, M. Petrocchi, F. Saracco, De Nicola, Online disinformation in the 2020 U.S. election: swing vs. safe states. EPJ Data Sci. vol. 13, n. 1, 2024

[2] S. Bistarelli, R. De Nicola, L. Galletta, C. Laneve, I. Mercanti, A. Veschetti, Stochastic modeling and analysis of the bitcoin protocol in the presence of block communication delays. Concurrency and Computation - Practice and Experience. Vol. 35, n. 16, 2023

[3] M. Wirsing, S. Jähnichen, R. De Nicola, Rigorous engineering of collective adaptive systems - 2nd special section. J. Softw. Tools Technol. Transf. 25(5): 617-624 (2023).

[4] R. De Nicola, L. Di Stefano, O. Inverso, S. Valiani Modelling flocks of birds and colonies of ants from the bottom up. J. Softw. Tools Technol. Transf. 25(5): 675-691 (2023).

[5] R. De Nicola, H. C. Melgratti: Multiparty testing preorders. Log. Methods Comput. Sci. 19(1) (2023)

[6] S. Soderi, R. De Nicola, 6G Networks Physical Layer Security Using RGB Visible Light Communications. IEEE Access 10: 5482-5496, 2022.

[7] R. De Nicola, L. Di Stefano, O. Inverso, A. Uwimbabazi: Automated replication of tuple spaces via static analysis. Sci. Comput. Program. 223: 102863, 2022.

[8] R. De Nicola, L. Di Stefano, O. Inverso, Verification of Distributed Systems via Sequential Emulation. ACM Trans. Softw. Eng. Methodol. 31(3): 37:1-37:41, 2022.

[9] J. Hajny, S. Ricci, E. Piesarskas, O. Levillain, L. Galletta, R. De Nicola Framework, Tools and Good Practices for Cybersecurity Curricula. IEEE Access 9: 94723-94747, 2021.

[10] R. Brundo Uriarte, H. Zhou, K. Kritikos, Z. Shi, Z. Zhao, R. De Nicola: Distributed service-level agreement management with smart contracts and blockchain. Concurr. Comput. Pract. Exp. 33(14), 2021.

[11] Guido Caldarelli, R. De Nicola, Marinella Petrocchi, Manuel Pratelli, Fabio Saracco: Flow of online misinformation during the peak of the COVID-19 pandemic in Italy. EPJ Data Sci. 10(1): 34, 2021.

[12] R. De Nicola , M. Petrocchi, M. Pratelli: On the efficacy of old features for the detection of new bots. Inf. Process. Manag. 58(6): 102685, 2021.

[13] 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.

[14] R. De Nicola, T. Duong, M. Loreti: Provably correct implementation of the AbC calculus. Sci. Comput. Program. 202: 102567, Elsevier 2021.

[15] 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.

[16] 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.

[17] 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.

[18] 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.

[19] R. De Nicola, G.L. Ferrari, R. Pugliese, F. Tiezzi: A formal approach to the engineering of domain-specific distributed systems. J. Log. Algebraic Methods Program. 111: 100511, Elsevier 2020.

[20] 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.

[21] R. De Nicola, L. Di Stefano, O. Inverso: Multi-agent systems with virtual stigmergy. Science of Computer Programming, Volume 187, February 2020. Elsevier 2020.

[22] 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.

[23] 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.

[24] 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.

[25] 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.

[26] 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.

[27] 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.

[28] V. Buravlev, R. De Nicola, C. A. Mezzina, Evaluating the efficiency of Linda implementations, Concurrency and Computation: Practice and Experience, 30(8), Wiley 2018.

[29] A. Labella, R. De Nicola, Initial Algebra for a System of Right-Linear Functors, Acta Cybernetica, 23 (1), 191–201, 2017.

[30] 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.

[31] 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.

[32] 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.

[33] 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.

[34] 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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[37] R. De Nicola and D. Gorla and A. Labella Tree-functors, determinacy and bisimulations, *Mathematical Structures in Computer Science*, 20(3):319-358, 2010.

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[42] R. De Nicola, J.-P. Katoen, D. Latella, M. Loreti and M. Massink, Model checking mobile stochastic logic, *Theoretical Computer Science*, 382(1): Elsevier 42-70, 2007.

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[45] R. De Nicola, D. Gorla, and R. Pugliese. On the expressive power of klaim-based calculi. *Theoretical Computer Science*, 356(3): 387-421, Elsevier 2006.

[46] R. De Nicola, D. Gorla, and R. Pugliese. Confining data and processes in global computing applications. *Science of Computer Programming*, 63(1): 57-87, Elsevier 2006.

[47] R. De Nicola, D. Sangiorgi: Types in concurrency. *Acta Informatica* 42(2-3): 79-81, Springer 2005.

[48] L. Bettini, R. De Nicola, and M. Loreti. Formulae meet programs over the net: A framework for correct network aware programming. *Autom. Softw. Eng.*, 11(3):245–288, 2004.

[49] R. De Nicola and M. Loreti. A modal logic for mobile agents. *ACM Transaction on Computational Logic*, 5(1):79–128, ACM 2004.

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[57] Rocco De Nicola, Gian Luigi Ferrari, Rosario Pugliese, and Betti Venneri. Types for access control. *Theoretical Computer Science*, 240(1):215–254, 2000.

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[66] Michele Boreale and Rocco De Nicola. Testing equivalence for mobile processes. *Information and Computation*, 120(2):279–303, 1995.

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[75] Rocco De Nicola and Matthew Hennessy. Testing equivalences for processes. *Theoretical Computer Science*, 34:83–133, 1984.

Edited Books

[1] 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.

[9] 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.

[11] P. Bottoni, R. De Nicola, D. Gorla: Essays for a Tribute to Anna Labella - Special Issue. J. Log. Algebraic Methods Program. 121: 100663. 2021

Invited Contributions to Books or Conference Proceedings

[1] G. Caldarelli, R. De Nicola, M. Petrocchi, F. Saracco Information spreading and the role of automated accounts onTwitter: 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.

[4] R. De Nicola and T. Duong and O. Inverso and F. Mazzanti: Verifying Properties of Systems Relying on Attribute-Based Communication, AErlang: Empowering Erlang with Attribute-Based Communication, Lecture Notes in Computer Science 10500, 169–190, Springer 2017.

[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.

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