Mauro Leoncini

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Working position

Full Professor of Computer Science
Department of Physics, Computer Science and Mathematics
University of Modena and Reggio Emilia

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Institutional activities at the University of Modena and Reggio Emilia

2023- Head of the Degree Program in Computer Science.

2019-2023 Member of the Joint Teachers-Students Commission (CPDS)

2019-2021 Member of the Department Board

2015-2023 Responsible for student tutoring.

2007 - 2014 Head of the Degree Program in Computer Science.

2007 Secretary of the Council of the Faculty of Mathematical, Physical and Natural Sciences.

2003 - 2007 Responsible for the activities guidance and tutoring of the Degree Program in Computer Science.

2002 Head of the Degree program in "Economics, Networks, Information".

Teaching activity

2022- Languages and Compilers, Bachelor Degree in Computer Science.

2019- Cryptography Algorithms, Master Degree in Computer Science.

2018- Computer Science, Bachelor Degree in Chemistry.

2018-2021 Dynamic languages, Bachelor Degree in Computer Science.

2017-2018 Introduction to Computer Science (Informatica Generale), Bachelor Degree in Mathematics.

2003-2018 Algorithms and Data Structures, Bachelor Degree in Computer Science.

2013-2015,2019- Several introductory courses to Computer Science for degrees in Health Professions (Obstetrics, Physiotherapy, ...), Pharmacy and Chemistry.

2013 - 2015 Approximation Algorithms, Master Degree in Mathematics.

2008 - 2015 Formal Languages and Compilation, Bachelor Degree in Computer Science.

Reasearch projects

Smartchain: Head of the industrial research project POR FESR Emilia Romagna textitSmartchain (2021-2022).

H2020: Participation in EU H2020 projects *Hercules* (High-Performance Real-Time Architectures for Low-Power Embedded Systems), *Fractal* (ECSEL-2 project, n 877056), *SECREDAS* (Cyber-Security for Cross Domain Reliable Dependable Automated Systems) and *I-MECH* (project ECSEL-2016 - Intelligent Motion Control Platform for Smart Mechatronic Systems)

2016-2019 Participation in a European initiative *ENABLE S3* (Enable Validation for Highly Automated Safe and Secure Systems)

2015-2016 Participation in the EU FP7 project *TETRACOM* (TETRACOM TTP)

2013-2016 Participation in the EU FP7 project *PSocrates* (Parallel SOftware framework for time CRitical mAny-core sysTEmS)

2016-17: Responsible for the research contract industrial *Efficient algorithms for services context-dependent*, commissioned by Expert System of Modena (12K EUR).

20014-16: Participant in the project funded by Cassa di Risparmio di Modena Foundation *Algorithms and Models for Building context-dependent Information delivery Tools* ("Applied Research for Innovation" project)

2013: Head of the industrial research contract *Uncovering relationships in large social networks: systems and algorithms*, commissioned by Expert System of Modena (10K EUR).

2013: Head of the industrial research contract *Optimization of communication between semantic services in Linux environment*, commissioned by Expert System of Modena (5K Euro).

Research interests

Analysis and synthesis of efficient algorithms in various computational models: sequential, parallel, distributed, wireless.
Computational complexity.
Efficient algorithms and software implementations for molecular biology problems.

Recent and main publications

1. Alessandro Gualtieri, Mauro Leoncini, et al. PRIN 2017 Fibres - A Multidisciplinary Mineralogical, Crystal-Chemical and Biological Project. What have we learned after four years of research? *PERIODICO DI MINERALOGIA*, Vol. 92, pp. 143-158 (2023).

2. A. Artioli, L. Bedogni, and M. Leoncini. Re-identification Attack based on Few-Hints Dataset Enrichment for Ubiquitous Applications. *IEEE World Forum on Internet of Things*, Yokohama (JP), October 26 – November 11, 2022.

3. E. Burani, G. Cabri, and M. Leoncini. An Algorithm to Predict E-Bike Power Consumption Based on Planned Routes. *Electronics*, Vol. 11, p. 1105-1119 (2022).

4. A. F. Gualtieri, M. Leoncini, L. Rinaldi, A. Zoboli, and D. Di Giuseppe. WebFPTI: A tool to predict the toxicity/pathogenicity of mineral fibres including asbestos. *Earth Science Informatics*, Vol. 14, p. 2401-2409 (2021).

5. G. De Marco, M. Leoncini, and M. Montangero. Distributed balanced color assignment on arbitrary networks. *Theoretical Computer Science*, Vol. 809, pp 313-326 (2020).

6. G. De Marco, M. Leoncini, and M. Montangero. A Distributed Message-Optimal Assignment on Rings. *Journal of Parallel and Distributed Computing*, vol. 132, October 2019, pages 284-298.

   https://doi.org/10.1016/j.jpdc.2019.05.007

7. M. Leoncini, M. Montangero, P. Valente, A Parallel Branch-and-Bound Algorithm to Compute a Tighter Tardiness Bound for Preemptive Global EDF, *Real-Time Systems* Journal, 55(2), 349-386, 2019. https://doi.org/10.1007/s11241-018-9319-6

8. G. De Marco, M. Leoncini, L. Mazzali, and M. Montangero, Distributed Beta-Assignment on graphs, in *Proc. of 18th Italian Conference on Theoretical Computer Science* (ICTCS 2017), Napoli, Italy, 26-28 September 2017, CEUR Workshop Proceedings, Vol 1949, 109-120, 2017.

9. E. Bergamini, R. D'Aurizio, M. Leoncini, M. Pellegrini. CNVScan: detecting borderline copy number variations in NGS data via scan statistics, *Proc. 6th ACM Conference on Bioinformatics, Computational Biology, and Health Informatics* (ACM BCB), Atlanta, GA (USA), September 09-12, 2015, 335-344.

10. M. Leoncini, M. Montangero, M. Pellegrini, and K. P. Tillan. CM-Stalker: a combinatorial tool for composite motif discovery, *IEEE/ACM Transactions on Computational Biology and Bioinformatics*, 12(5), 1123-1136 (2015).

11. M. Leoncini, M. Montangero, M. Pellegrini, and K. P. Tillan. CMF: a combinatorial tool to find composite motifs, Proc. *LION 7 (Learning and Intelligent OptimizatioN) Conference*, Catania (Italy), 7-11

12. M. Federico, M. Leoncini, M. Montangero e P. Valente: Direct vs 2-Stage Approaches to Structured Motif Finding, *Algorithms for Molecular Biology*, 2012, 7:20.

13. F. Geraci, M. Leoncini, M. Montangero, M. Pellegrini, and M.E. Renda, K-Boost: a Scalable Algorithm for High-Quality Clustering of Microarray Gene Expression Data, *Journal of Computational Biology*, 16(6), pp. 859-873 (2009).

14. D. M. Blough, M. Leoncini, G. Resta, and P.Santi, Topology Control with Better Radio Models: Implications for Energy and Multi-Hop Interference, *Performance Evaluation*, 64:5 (2007), pp. 379-398.

15. B. Codenotti, M. Leoncini e G. Resta, Efficient Computation of Nash Equilibria for Very Sparse Win-Lose Games, Proc. *European Symposium on Algorithms* (ESA 2006), *Lecture Notes in Computer Science*, Vol. 4168, pp. 232-243.

16. D. M. Blough, M. Leoncini, G. Resta e P.Santi, The k-Neighbors Approach to Interference Bounded and Symmetric Topology Control in Ad Hoc Networks, *IEEE Transactions on Mobile Computing*, Vol. 5, Issue 9 (2006), pp. 1267-1282.

17. I. Bar-On e M. Leoncini, Reliable Parallel Solution of Bidiagonal Systems, *Numerische Mathematik* **90** (2002), 415-440.

18. B. Codenotti, M. Leoncini e F. P. Preparata, The role of arithmetic in fast parallel matrix inversion, *Algorithmica* **30** (2001), 685-707.

19. I. Bar-On e M. Leoncini, Reliable solution of tridiagonal systems of linear equations. *SIAM J. of Numerical Analysis* **38** (2000), 1134-1153.

20. M. Leoncini, G. Manzini e L. Margara, Parallel complexity of numerically accurate linear system solvers, *SIAM J. Computing* **28** (1999), 2030-2058.

21. B. Codenotti, B. N. Datta, K. Datta e M. Leoncini, Parallel Algorithms for Certain Matrix Computations, *Theoretical Computer Science* **180** (1997), 287-308.

22. I. Bar-On, B. Codenotti e M. Leoncini, A Fast Parallel Cholesky Decomposition Algorithm for Tridiagonal Symmetric Matrices, *SIAM J. Matrix Analysis and Applications* **18** (1997), 403-418.

23. M. Leoncini, On the Parallel Complexity of Gaussian Elimination with Pivoting, *Journal of Computer and System Sciences* **53** (1996), 380-394.

24. V. Brimkov, B. Codenotti, M. Leoncini e G. Resta, Strong NP-completeness of a Matrix Similarity Problem, *Theoretical Computer Science* **165** (1996), 483-490.

25. M. Leoncini, On Speed versus Accuracy: Some Case Studies, *Journal of Complexity*, **12** (1996), 239-253.

26. B. Codenotti, M. Leoncini e G. Resta, Oracle Computations in Parallel Numerical Linear Algebra, *Theoretical Computer Science* **127** (1994), 99-121.