Curriculum vitae
of Luca Gemignani

Personal Data

place of birth	Lucca (LU), Italy
date of birth	March 13, 1963
nationality	Italian
address	via Vittorio Bottego 59, Viareggio (LU), 55049 Italy
e-mail address	luca.gemignani@unipi.it
website	http://pages.di.unipi.it/gemignani/

Education

1978-1982	High School Qualification: Diploma Liceo Scientifico (Scientific Education), Liceo Scientifico Barsanti e Matteucci Viareggio (LU)
1983-1987	Master Degree in Mathematics, University of Pisa. Title of Master Thesis " Numerical Methods for Simultaneously Computing All the Zeros of a Polynomial", supervisor Prof. D.A. Bini

Career Summary

1988-1989	Military service as artillery officer of Italian Army
1989-1991	Data processing center official at Italian National Institute of Social Security (I.N.P.S.) in Florence
1991-1994	Assistant Professor at Mathematics Department of University of Parma, Parma, Italy
1994-1998	Assistant Professor at Computer Science Department of University of Pisa, Pisa, Italy
1998-2012	Associate Professor of Numerical Analysis at Mathematics Department of University of Pisa, Pisa, Italy
2012-	Full Professor of Numerical Analysis at Computer Science Department of University of Pisa, Pisa, Italy
Teaching	From 1991 to today he served as teacher and/or instructor in more than 60 courses of numerical computing, numerical analysis, scientific computing, approximation theory and computational mathematics at the Unversity of Pisa and Parma. Among the courses taught during the three most recent terms:

2018	Numerical Computing with Laboratory for the Bachelor Degree in Biomedical Engeneering at University of Pisa
2018	High Performance Scientific Computing for the Master Degree in Computer Science and Networking at University of Pisa
2019	Numerical Computing for the Bachelor Degree in Computer Science at University of Pisa

Research Research activity falls into the field of computational mathematics. More specific areas are: structured numerical linear algebra, polynomial computations and the exploitation of the symbolic-numeric interface in these fields. The primary focus is concerned with the numerous and varied problems associated with solving (systems of) linear and nonlinear equations, including issues like the complexity analysis and the design of efficient algorithms based on structural properties. The main scientific contributions of Luca Gemignani include:

(a) The design of computationally efficient adaptations of the QR eigenvalue algorithm for computing all the eigenvalues of matrices with recursive and rank structures

(b) The development of fast and numerically reliable algorithms for structured matrices (e.g., Toeplitz, Hankel, Hurwitz, Vandermonde, Bezout and related matrices)

(c) Analysis of the complexity and design of efficient algorithms for the numerical approximation of zeros of polynomials and analytic functions, with applications to spectral factorization problems in control theory and signal processing

(d) Algebraic algorithms for symbolic and numeric-symbolic computations with polynomials and structured matrices

(e) Applications of the structured matrix technology for the analysis and design of solution algorithms for computational problems arising in the field of approximation theory and CAGD

The results of this research activity have been presented at many international conferences of computational mathematics. Luca Gemignani is the author of more than 80 referred publications in international journals; acts as a referee for several prestigious journals in the field of computational mathematics and he has been Editor for a special issue of Linear Algebra and its Applications, 2010. Ad December 2019 the values of "H-index" are 15 (Scopus), 21 (Google Scholar) and 15 (web of science). The most relevant publications are reported below

Relevant Publications

2005	D.A. Bini, L. Gemignani, and V.Y. Pan. "Fast and stable QR eigenvalue algorithms for generalized companion matrices and secular equations". In: *Numerische Mathematik* 100.3 (2005). cited By 59, pp. 373–408. DOI: 10.1007/s00211-005-0595-4
2002	D.A. Bini, L. Gemignani, and B. Meini. "Computations with infinite Toeplitz matrices and polynomials". In: *Linear Algebra*

and Its Applications 343 (2002). cited By 48, pp. 21–61. DOI: [10.1016/S0024-3795(01)00341-X](10.1016/S0024-3795(01)00341-X)

2004   D.A. Bini, F. Daddi, and L. Gemignani. "On the shifted QR iteration applied to companion matrices". In: *Electronic Transactions on Numerical Analysis* 18 (2004). cited By 33, pp. 137–152

2007   D.A. Bini, Y. Eidelman, L. Gemignanl, and I. Gohberg. "Fast Qr eigenvalue algorithms for hessenberg matrices which are rank-one perturbations of unitary matrices". In: *SIAM Journal on Matrix Analysis and Applications* 29.2 (2007). cited By 32, pp. 566–585. DOI: [10.1137/050627563](10.1137/050627563)

2004   D.A. Bini, L. Gemignani, and V.Y. Pan. "Inverse Power and Durand-Kerner Iterations for Univariate Polynomial Root-Finding". In: *Computers and Mathematics with Applications* 47.2-3 (2004). cited By 32, pp. 447–459

2004   D.A. Bini and L. Gemignani. "Bernstein-Bezoutian matrices". In: *Theoretical Computer Science* 315.2-3 (2004). cited By 27, pp. 319–333. DOI: [10.1016/j.tcs.2004.01.016](10.1016/j.tcs.2004.01.016)

2010   D.A. Bini, P. Boito, Y. Eidelman, L. Gemignani, and I. Gohberg. "A fast implicit QR eigenvalue algorithm for companion matrices". In: *Linear Algebra and Its Applications* 432.8 (2010). cited By 24, pp. 2006–2031. DOI: [10.1016/j.laa.2009.08.003](10.1016/j.laa.2009.08.003)

2005   M. Van Barel, D. Fasino, L. Gemignani, and N. Mastronardi. "Orthogonal rational functions and structured matrices". In: *SIAM Journal on Matrix Analysis and Applications* 26.3 (2005). cited By 23, pp. 810–829. DOI: [10.1137/S0895479803444454](10.1137/S0895479803444454)

2007   Y. Eidelman, I. Gohberg, and L. Gemignani. "On the fast reduction of a quasiseparable matrix to Hessenberg and tridiagonal forms". In: *Linear Algebra and Its Applications* 420.1 (2007). cited By 21, pp. 86–101. DOI: [10.1016/j.laa.2006.06.028](10.1016/j.laa.2006.06.028)

2011   C. Conti, L. Gemignani, and L. Romani. "From approximating to interpolatory non-stationary subdivision schemes with the same generation properties". In: *Advances in Computational Mathematics* 35.2 (2011). cited By 20, pp. 217–241. DOI: [10.1007/s10444-011-9175-6](10.1007/s10444-011-9175-6)

2006   D.A. Bini, L. Gemignani, and F. Tisseur. "The Ehrlich-aberth method for the nonsymmetric tridiagonal eigenvalue problem". In: *SIAM Journal on Matrix Analysis and Applications* 27.1 (2006). cited By 19, pp. 153–175. DOI: [10.1137/S0895479803429788](10.1137/S0895479803429788)

| 1995 | Dario Bini and Luca Gemignani. "Fast parallel computation of the polynomial remainder sequence via Bezout and Hankel matrices". In: *SIAM Journal on Computing* 24.1 (1995). cited By 19, pp. 63–77. DOI: 10.1137/S0097539791201903 |

Administrative Experience

2003-2005	Director of a center of computer services for teaching at the University of Pisa
2005-2006	Member of the mathematics subject area group within the Tuning Project supported by the European Commission for the harmonization of mathematics degree profiles in Europe under the the Bologna process
2012-2014	Member of the board of the PhD program in Computer Science and the Mathematics of Computation at the University of Insubria, Como, Italy

Fundings and Projects

200-2002	Italian national research project PRIN n.MM01151559_004 coordinated by Prof. Verdi Claudio, University of Milan, Italy, entitled " Analysis and Design of Efficient Algorithms for Computational Problems with Structured Matrices"
2003-2004	Research project supported by Italian national group on Scientific Computing entitled "Innovative Numerical Methods for Large and Structured Matrices"
2017-2019	Research project supported by the University of Pisa entitled "Innovative models and algorithms for large and structured computational problems"

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