

CURRICULUM VITAE

Federico Giovanni Poloni

Personal information

Born 1st January 1983 in Treviglio (BG), Italy.
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Studies

2008–now attending a Ph.D. course (It: *corso di perfezionamento*) in Mathematics at the *Scuola Normale Superiore*, Pisa, Italy.
2008 Final diploma for the *corso ordinario* at the Scuola Normale Superiore (info: http://en.wikipedia.org/wiki/Scuola_normale). Average exam mark during the five years of the *corso ordinario*: 30/30.
2007 Master degree (It: *laurea specialistica*) in Mathematics at the University of Pisa, Italy, mark 110/110 with honours. Thesis (in Italian): *Methods for the fast solution of a class of algebraic Riccati equations*, supervisors: D. A. Bini and B. Meini. Average exam mark during the course: 29.50/30.
2005 Bachelor degree (It: *laurea triennale*) in Mathematics at the University of Pisa, Italy, mark 110/110 with honours. Thesis (in Italian): *Discrete Fourier transform and canonical factorization in a queuing theory problem*, supervisor: D. A. Bini. Average exam mark during the course: 29.54/30.

Research interests

General field: numerical linear algebra and matrix analysis.

- Matrix equations: Algebraic Riccati equations, quadratic matrix equations, matrix equations in applied probability.
- Matrix structures: displacement structure, Toeplitz and Cauchy-like matrices, fast and superfast algorithms for rank-structured matrices.
- Computational aspects of matrix geometric means

Publications

2010 D. A. Bini, B. Meini, F. Poloni. *An effective matrix geometric mean satisfying the Ando–Li–Mathias properties*. *Math. Comp.* 79 (2010), pp. 437–452.
2009 D. A. Bini, B. Meini, F. Poloni. *Fast solution of a certain Riccati Equation through Cauchy-like matrices*, *Electron. Trans. Numer. Anal.* 33 (2009), pp. 84–104.
2008 D. A. Bini, B. Iannazzo, F. Poloni. *A Fast Newton's Method for a Nonsymmetric Algebraic Riccati Equation*. *SIAM J. Matrix Anal. Appl.* 30 (2008), no. 1, pp. 276–290.

Preprints and e-prints

2009 F. Poloni. *Constructing matrix geometric means*. arXiv:0906.3132v1 [math.NA], <http://arxiv.org/abs/0906.3132>. Submitted for publication.
2008 D. A. Bini, B. Meini, B. Iannazzo, F. Poloni. *Nonsymmetric algebraic Riccati equations associated with an M-matrix: recent advances and algorithms*. Dagstuhl seminar proceedings n. 07461, <http://drops.dagstuhl.de/opus/volltexte/2008/1395>. To appear in *Matrix methods: theory, algorithms and applications*, World Scientific Publishers.

- 2008 D. A. Bini, B. Meini, F. Poloni. *From algebraic Riccati equations to unilateral quadratic matrix equations: old and new algorithms*. Dagstuhl seminar proceedings n. 07461, <http://drops.dagstuhl.de/opus/volltexte/2008/1398>. Submitted for publication.
- 2006 D. A. Bini, F. Poloni. *A note on the location of polynomial roots*. arXiv:math/0609297v1 [math.NA], <http://arxiv.org/pdf/math/0609297>.

Conference talks

- 2009 Monterey, CA (USA), *SIAM Applied Linear Algebra Conference*, minisymposium on functions of matrices; talk: *Geometric means of more than two matrices*
- 2009 Montecatini Terme (Italy), *GNCS Congress*, and Perugia (Italy), *Two days of numerical linear algebra*, talk (in Italian): *An efficient matrix means satisfying the Ando-Li-Mathias properties*.
- 2008 Cortona (Italy), *Structured Linear Algebra Problems: Analysis, Algorithms, and Applications*, talk: *Some implementation issues on the GKO algorithm*.
- 2008 Bologna (Italy), *Two days of numerical linear algebra*, talk: *SDA and cyclic reduction for a rank-structured algebraic Riccati equation*.
- 2007 Schloss Dagstuhl (Germany), *Dagstuhl seminar 07461: Numerical Methods for Structured Markov Chains*, talk: *Old and new algorithms for algebraic Riccati equations*.
- 2007 Moscow (Russia), *2nd International Conference on Matrix Methods and Operator Equations*, talk: *Exploiting displacement structure in the solution of a class of nonsymmetric algebraic Riccati equations*.
- 2007 Padua (Italy), *Two days of numerical linear algebra*, talk (in Italian): *Fast Newton method for an algebraic Riccati equation*.

Summer schools

- 2009 Trieste (Italy), *Summer School and Advanced Workshop on Trends and Developments in Linear Algebra*.
- 2008 Castro Urdiales (Spain), *SIAG/LA-SIMUMAT International Summer School on Numerical Linear Algebra*.

Teaching activities

- 2008–2009 Tutoring activities for first-year students of the Scuola Normale.
- 2008–2009 Two computer lab classes supporting the Numerical Analysis course (bachelor degree in Mathematics) at the University of Pisa in academic years 2008–2009 and 2009–2010.
- 2004–now Many teaching activities for the preparation of high-school students to the Italian and international mathematical Olympiads: lecturer in seminars held in Campobasso (2009), Brescia (2008–2009), Perugia (2007–2008), and Pavia (2005), and in advanced seminars held in Pisa (2004–2005, 2007–2008).

Other work experiences

- 2003–now Collaborations with the organising committee of the Italian mathematical Olympiad: taking part in the Italian Olympiads as organiser and judge (2004–2008); proposing problems; correcting exam papers. Member of the scientific staff following the Italian team to several international competitions: Romanian Master of Mathematics 2009, international mathematical Olympiad 2009. Member of the organizing committee since 2009.
- 2004–2007 system administrator of a small computer lab (12 Linux+Windows workstations, 500+ users, Linux and Windows servers), in collaboration with the computing centre of the Scuola Normale.

Awards

- 2007 *2nd matrix prize for young speakers*, for the talk presented during the 2nd ICMMOE in Moscow (see **Conferences and workshops**).
- 2004 *Championnat international de jeux mathématiques* (CIJM): 1st place in the Italian stage, 1st place in the international finals (Paris, France).
- 2003 CIJM: 4th place in the Italian stage.
- 2002 International mathematical Olympiad (IMO): 2nd place in the Italian Olympiad; 1st place in the Italian team selection test; bronze medal with 17 points (best result *ex aequo* in the Italian team) in the 43rd international mathematical Olympiad in (Glasgow, UK).
- 2001 IMO: 3rd place in the Italian Olympiad; 1st place in the Italian team selection test; honourable mention in the 42nd international mathematical Olympiad (Washington D.C., USA) with 9 points.

Also finalist in the Italian physics Olympiad (2002) and informatics Olympiad (2001).

Language skills

Italian Mother tongue.

English Excellent, both written and spoken.
June 2002: University of Cambridge's *First Certificate in English*, grade A.

French Good, both written and spoken.

Computer skills

Operating systems GNU/Linux: excellent knowledge (use and administration). Windows: good knowledge (use and administration).

Office apps Good knowledge (word processing, spreadsheets, database).

Programming Good knowledge of C++, C, Matlab. Basic knowledge of FORTRAN 90, Perl, shell scripting, Pascal. Programming experiences with the following libraries: Boost, GTK+, GTKmm, TNT Template Numerical Toolkit, ncurses.

Typesetting Good knowledge of L^AT_EX, basic HTML with CSS.

Hobbies

Programming, learning and using GNU/Linux; juggling; basketball; contract bridge; strategy games; reading science-fiction books.

November 3, 2009