

CURRICULUM VITÆ ET STUDIORUM

Silvia Gazzola

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Personal Data

Date of Birth: February 9, 1985
Place of Birth: Piacenza - Italy
Nationality: Italian

Current Position

Post-Doctoral Researcher Department of Mathematics, University of Padova (Italy).
(since February 1, 2014)

Current Research Topic: Krylov projection methods for linear inverse problems.
Supervisor: Prof. Michela Redivo Zaglia.

Past Positions

- **Ph.D. Student in Mathematics.**
Doctoral School in Mathematical Sciences - Computational Mathematics Area.
University of Padova (Italy), January 1, 2011–December 31, 2013.

Research Topics

Regularization techniques, Krylov subspace methods, numerical linear algebra, image restoration problems, inverse problems, boundary element methods.

Degrees

- **Ph.D. in Mathematics;** March 10, 2014, University of Padova (Italy).
Grade: excellent.
- **M.Sc. in Pure and Applied Mathematics;** October 19, 2010, University of Parma (Italy).
Grade: 110/110 *cum laude*.
- **B.Sc. in Mathematics;** April 29, 2008, University of Parma (Italy). Grade: 101/110.

Skills

Languages:

- Italian (mother tongue).
- English (very fluent).

Software:

- Operating Systems: Microsoft Windows (excellent), GNU/Linux (basic), Mac OS X (basic).
- Programming Languages: Matlab (excellent), Fortran (basic), C++ (basic).

Visiting Experiences

- *Department of Mathematics, Kent State University, Kent (OH, USA).*
Research Scholar, hosted by Prof. L. Reichel.
September 15 - December 18, 2014.
- *Department of Mathematics and Computer Science, Emory University, Atlanta (GA, USA).*
Hosted by Prof. J. Nagy.
 - October 28 - November 2, 2014;
 - October 18 - November 8, 2013;
 - September 19, 2012 - January 29, 2013 (as a Short-Term Scholar).
- *Department of Mathematics, Virginia Tech, Blacksburg (VA, USA).*
Hosted by Prof. J. Chung.
September 4 - 14, 2014.

Grants and Awards

- “Young Researchers” grant.
Funded by GNCS (Gruppo Nazionale Calcolo Scientifico - Italian Mathematical Association).
One-year funding to attend meetings, workshops, seminars, conferences. September 2014.
- Post-doctoral grant.
Funded by the University of Padova. January 2014.
- SIAM UKIE Prize for the best student talks.
25th Biennial Numerical Analysis Conference, University of Strathclyde. June 2013.
- Three-year doctoral scholarship at the University of Padova.
Funded by CaRiPaRo Foundation. December 2010.

Funded Research Projects

As a participant

- Member of the Project “Multivariate approximation with applications to image reconstruction”, University of Padova. Year: 2012.
- Member of the Project “Numerical methods for ill-posed linear systems with applications to image restoration”, University of Padova. Year: 2011.
- Member of the Project “EX 60%” (“Ricerca Scientifica fondi quota EX 60%”, University of Padova): “Extrapolation Methods and Numerical Linear Algebra: theory, algorithms, and applications”.
Years: 2011, 2012, 2013.
- Member of the Project “EX 60%” (“Ricerca Scientifica fondi quota EX 60%”, University of Padova): “Numerical Approximation: theory, algorithms, and applications”. Year: 2010.

Publications

Refereed Papers in Journals

- S. Gazzola, P. Novati, and M. R. Russo. On Krylov projection methods and Tikhonov regularization. *Electron. Trans. Numer. Anal.*, to appear.
- S. Gazzola, P. Novati, and M. R. Russo. Embedded techniques for choosing the parameter in Tikhonov regularization. *Numer. Linear Algebra Appl.*, 21(6):796–812, 2014.
- S. Gazzola and J. Nagy. Generalized Arnoldi-Tikhonov method for sparse reconstruction. *SIAM J. Sci. Comput.*, 36(2):B225–B247, 2014.
- S. Gazzola and P. Novati. Automatic parameter setting for Arnoldi-Tikhonov methods. *J. Comput. Appl. Math.*, 256:180–195, 2014.
- S. Gazzola and P. Novati. Multi-parameter Arnoldi-Tikhonov methods. *Electron. Trans. Numer. Anal.*, 40:452–475, 2013.
- A. Aimi, S. Gazzola, and C. Guardasoni. Energetic boundary element method analysis of wave propagation in 2D multilayered media. *Math. Methods Appl. Sci.*, 35:1140–1160, 2012.
- A. Aimi, S. Gazzola, and C. Guardasoni. Energetic BEM for domain decomposition in 2D wave propagation problems. *Commun. Appl. Ind. Math.*, 2(1):1–22, 2011.

Submitted Papers

- S. Gazzola and P. Novati. On the inheritance of the Discrete Picard Condition. February 2015.
- S. Gazzola and L. Reichel. A new framework for multi-parameter regularization. January 2015.

Theses

- Regularization techniques based on Krylov methods for ill-posed linear systems. Ph.D. thesis, University of Padova, 2014. Advisor: Dr. P. Novati.
- Un metodo energetico agli elementi di contorno per problemi di propagazione ondosa in multidomini (Energetic boundary element method for wave propagation problems in multilayered media). Master thesis, University of Parma, 2010. Advisor: Dr. A. Aimi. Co-advisor: Dr. C. Guardasoni.

Others

- D. Cellai, A. Faqeeh, S. Gazzola, A. Gloster, A. Hegarty, E. Kashdan, A. S. Nielsen, K. O’Sullivan, and A. Parnell. Analysis and interpretation of Tellus Border Electromagnetic Data. Technical Report, 102nd European Study Group with Industry, UCD, 2014. Soon available at <http://mathsci.ucd.ie/esgi/>.
- S. Gazzola. Regularization by means of Generalized Arnoldi-Tikhonov methods. Notes of a seminar, *Seminario Dottorato 2012/2013* (Department of Mathematics, University of Padova), pp. 78–87. Available at http://dottorato.math.unipd.it/sites/default/files/SemDott1213_note.pdf.

Editorial Activities

- Referee Service for: *Applied Mathematics and Computation*, *BIT Numerical Mathematics*, *SIAM Journal on Matrix Analysis and Applications*.
- Managing Editor for: *Electronic Transactions on Numerical Analysis*, October 2014–present.

Attended Conferences, Summer Schools, Workshops, Meetings

- *Inverse Problems and Spectral Theory*, Texas A&M University, College Station (TX, USA), October 17–19, 2014.
- *SIMAI 2014*, Taormina (Italy), July 7–10, 2014.
- *102nd European Study Group with Industry (ESGI102)*, UCD, Dublin (Ireland), June 30–July 4, 2014.
- *Householder Symposium XIX*, Spa (Belgium), June 8–13, 2014.
- *Numerics in Image and Surface Processing*, Workshop, Bologna (Italy), January 30–31, 2014.
- *Nonlinear Evolution Equations and Linear Algebra*, Cagliari (Italy), September 2–5, 2013.
- *25th Biennial Numerical Analysis Conference*, Glasgow (UK), June 25–28, 2013.
- *International Conference on Preconditioning Techniques for Scientific and Industrial Applications*, Oxford (UK), June 19–21, 2013.
- *3rd Dolomites Workshop on Constructive Approximation and Applications*, Alba di Canazei (Italy), September 9–14, 2012.
- *2012 SIAM Conference on Applied Linear Algebra*, Valencia (Spain), June 18–22, 2012.
- *Due Giorni di Algebra Lineare Numerica* (Two Days on Numerical Linear Algebra), Genova (Italy), February 16–17, 2012.
- *International Conference on Scientific Computing (SC2011)*, S. Margherita di Pula (Italy), October 10–14, 2011.
- *XIX Congresso dell'Unione Matematica Italiana* (19th Italian Mathematical Association Conference), Bologna (Italy), September 12–17, 2011.
- *Current Challenges in Stability Issues for Numerical Differential Equations*, CIME-EMS Summer School in Applied Mathematics, Cetraro (Italy), June 27–July 2, 2011.
- *Integral Equations: recent numerical developments and new applications*, Workshop, Parma (Italy), October 29–30, 2009.

Scientific Communications

Talks

- *Adaptive choice of the regularization parameter and matrix for the Arnoldi-Tikhonov methods*, SIMAI 2014, Taormina (Italy). Within the Minisymposium “Numerical methods for inverse problems and image processing”. July 8, 2014.
- *Arnoldi-Tikhonov methods with applications to Sparse Reconstruction*, 25th Biennial Numerical Analysis Conference, Glasgow (UK). June 25, 2013.
- *Regularization by means of Generalized Arnoldi-Tikhonov methods*, Seminario Dottorato, University of Padova, Padova (Italy). March 20, 2013.
- *Automatic parameter setting for Arnoldi-Tikhonov methods*, 3rd Dolomites Workshop on Constructive Approximation and Applications, Alba di Canazei (Italy). September 11, 2012.
- *BEM for wave propagation problems in 2D multilayered media*. NumLab Seminars, University of Padova, Padova (Italy). January 25, 2011.

Invited Seminars

- *Regularizing inverse problems by Krylov subspace methods*, Seminar, Emory University (USA). October 31, 2014.
- *Regularizing inverse problems by Krylov subspace methods*, Computational and Applied Mathematics Seminar, Kent State University (USA). September 26, 2014.
- *Regularization by Krylov subspace methods*, Colloquium, Department of Mathematics, Virginia Tech (USA). September 5, 2014.
- *Regularization by Krylov subspace methods*, Seminar, Emory University (USA). November 1, 2013.
- *Generalized Arnoldi-Tikhonov methods for Sparse Reconstruction*, Seminar, Emory University (USA). January 23, 2013.

Posters

- *Arnoldi-Tikhonov Methods for Sparse Reconstruction*, Inverse Problems and Spectral Theory, College Station (USA). October 18, 2014.
- *Arnoldi-Tikhonov Methods for Sparse Reconstruction*, Householder Symposium XIX, Spa (Belgium). June 10, 2014.
- *Numerical Methods for Image Reconstruction*, Notte dei Ricercatori (Researchers' Night), Padova (Italy). September 27, 2013.
- *Parameter selection strategies for the Arnoldi-Tikhonov methods*, Nonlinear Evolution Equations and Linear Algebra, Cagliari (Italy). September 3, 2013.

Teaching Experiences

- Adjunct instructor: Numerical Analysis courses for undergraduate students in Engineering, University of Padova (Italy). Years: 2012, 2014.
- Course assistant: Numerical Analysis Laboratory for undergraduate students in Engineering, University of Padova (Italy). Years: 2013, 2014.

Professional Memberships

- Member of SIMAI (Italian Society for Applied and Industrial Mathematics). Years: 2011, 2014.
- Member of GNCS (National Scientific Computing Group). Years: 2011, 2012, 2013, 2014.

Other Activities

- Ph.D. students representative in the Faculty Council of the Department of Mathematics, University of Padova. Years: 2011, 2012.
- Ph.D. students representative in the Directive Council of the Doctoral School of Mathematical Sciences, University of Padova. Year: 2012.
- Degree in Guitar, Conservatory of Music, Piacenza (Italy), July 2008.