

# Elisa Riccietti – Curriculum vitae

May 19, 2017

## Personal data

**Nationality:** Italian

**Address:** Via Botticelli 90, Prato, 59100

**Date and place of Birth:** 23<sup>rd</sup> February 1990, Firenze

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## Positions and Internships

- **November 2014**– Collaboration with Department of Industrial Engineering, at Università degli Studi di Firenze.
  - Topic: machine learning techniques (Support Vector Machines, Artificial Neural Networks, Self Organizing Maps) with applications to turbomachinery components design.
- **November 2014–November 2017** PhD in Mathematics, Information and Statistical sciences, Università degli Studi di Firenze, Dipartimento di Matematica e Informatica Ulisse Dini. Expected date of award: February 2017.
  - Advisor: Prof. Stefania Bellavia , Department of Industrial Engineering - Numerical Analysis Group.
  - Research interests: development and implementation of numerical optimization methods such as regularized iterative methods for ill-posed nonlinear systems, Levenberg-Marquardt methods for large scale nonlinear noisy least squares problems.
- **February–June 2014** Internship at research center Enel Ingegneria e Ricerca in Pisa.
  - Topic: development of a Particle Swarm Optimization (PSO) and of a Sequential Linear Programming (SLP) solver for the optimization of energy districts.

## Education

- **15 October 2014** Master degree in Mathematics, Numerical Optimization, 110/110 cum laude, Università degli Studi di Firenze.
  - Title: Numerical methods for optimization problems: an application to energetic districts.
  - Advisor: Prof. Stefania Bellavia, Università degli Studi di Firenze, Co-Advisor: Dott. Stefano Sello, Enel Ingegneria e Ricerca.
- **17 October 2012** Bachelor degree in Mathematics, Numerical Analysis, 110/110 cum laude, Università degli Studi di Firenze.
  - Title: Eulers Gamma function and the trapezoidal rule.
  - Advisor: Prof.ssa Alessandra Papini, Università degli Studi di Firenze.

## Visiting

- **June-July 2016, November 2016-January 2017, June-July 2017** Visiting at INP-ENSEEIH, Toulouse, for a collaboration with Prof. Serge Gratton on large-scale nonlinear least-squares problems with noisy function.

## Scholarships awarded

- **October 2014** Winner of a PhD scholarship at Università degli Studi di Firenze.
- **October 2014** Winner of a PhD scholarship at Università degli Studi Insubria.
- **October 2014**, Winner of a PhD scholarship at IMT (Institute for Advanced Studies) Lucca.

## Awards

- May 2016, Winner of the degree award 'Hansjörg Wacker Memorial Prize', jointly funded by ECMI (European Consortium of Mathematics in Industry) and by a consortium of institutions from Linz.
- October 2015, Winner of the degree award 'Premio Laurea Magistrale o Specialistica in Matematica ed Informatica', by Università degli Studi di Firenze.
- October 2015, Winner of the degree award 'Premio di Laurea Magistrale Mario Negri', by Fondo Mario Negri.

## Talks

- *A Levenberg-Marquardt Method for Large-Scale Noisy Nonlinear Least Squares Problems*, SIOPT 2017, Vancouver, Canada, 22/05/2017-25/05/2017.
- *Levenberg-Marquardt methods for the solution of ill-posed nonlinear least squares problems*, talk given for the PhD course, Università di Firenze, 27/09/2016.
- *Levenberg-Marquardt method for ill-posed large scale nonlinear least squares problems*, poster, OIP2016-Optimization Techniques for Inverse Problems III, Modena, 19/09/2016- 21/09/2016.
- *Support Vector Machine classification applied to the parametric design of centrifugal pumps*, Congresso Nazionale SIMAI2016, Milano, 13/09/2016-16/09/2016.
- *Regularizing trust-region approaches for ill-posed nonlinear systems and nonlinear least squares*, 20th Conference of the International Linear Algebra Society (ILAS), Leuven, Belgium, 11/07/2016-15/07/2016, invited speaker.
- *Numerical methods for optimization problems: an application to energetic districts*, 19th European Conference on Mathematics for Industry, Santiago de Compostela, Spain, 13/06/2016-17/06/2016, invited speaker for receiving the degree award 'Hansjrg Wacker Memorial Prize'.
- *Solving ill-posed nonlinear systems with noisy data: a regularizing trust-region approach*, "PING - Inverse Problems in Geophysics" Workshop Firenze, 6/04/2016.
- *A regularization trust-region approach for ill-posed nonlinear systems*, Workshop 'Optimization and Data Assimilation', CERFACS, Toulouse (France), 13/01/2016-15/01/2016.
- *On an Adaptive Regularization for Ill-posed Nonlinear Systems and its Trust-Region Implementation* Networking in Numerical Analysis 2015 a two day meeting in Bertinoro', Bertinoro (FC), 21/2015-22/11/2015.
- *Trust-region methods for ill-posed nonlinear systems*, talk given for the PhD course, Università di Firenze, 15/10/2015.
- *On an Adaptive Regularization for Ill-posed Nonlinear Systems and its Trust-Region Implementation*, XX Congresso UMI, Siena, 12/09/2015.
- *Support Vector Machine methods for optimization*, talk given for the optimization course, Università di Firenze, 10/05/2015.

## Participation to Schools and other Conferences

- Summer school on optimization, big data and applications (OBA), Veroli, Italy, 02/07/2017-08/07/2017.
- ISMP 2015, 22nd International Symposium on Mathematical Programming, Pittsburgh (USA), 12/07/2015- 17/07/2015.
- Exploiting Hidden Structure in Matrix Computations. Algorithms and Applications, CIME-EMS Summer School in Applied Mathematics 2015 - Cetraro (CS), 22/06/2015-26/06/2015.

## Participation to research projects

- 2017 INDAM-GNCS Project *Numerical methods for large scale constrained optimization problems and applications*, Coordinator: Prof. Luca Bergamaschi, Università di Padova.
- 2016 INDAM-GNCS Project *PING - Inverse Problems in Geophysics*, Coordinator: Prof. Giuseppe Rodriguez , Università di Cagliari.
- 2015 INDAM-GNCS Project *Regularizing methods for optimization problems and applications* , Coordinator: Prof. Stefania Bellavia, Università degli Studi di Firenze.

## Publications

### Journal articles

- S.Bellavia, B.Morini, E.Riccietti, *On an adaptive regularization for ill-posed nonlinear systems and its trust-region implementation*, Computational Optimization and Applications, pp 1-30, 2015.

### Preprints

- S.Bellavia, S.Gratton, E.Riccietti, *A Levenberg-Marquardt method for large nonlinear least-squares problems with noisy functions and gradients*, submitted.
- E. Riccietti, J.Bellucci, M.Checucci, M.Marconcini, A.Arnese, *Support Vector Machine classification applied to the parametric design of centrifugal pumps*, submitted to Engineering Optimization, second revision.
- S.Bellavia, E.Riccietti, *On Non-stationary Tikhonov procedures for discrete ill-posed nonlinear least squares problems*, submitted to Inverse Problems, second revision.
- E.Riccietti, S.Bellavia, S.Sello, *Sequential Linear Programming and Particle Swarm Optimization for the optimization of energy districts*, submitted to Engineering Optimization, second revision.

### Proceedings

- E.Riccietti, S.Bellavia, S.Sello, *Numerical methods for optimization problems arising in energetic districts*, accepted in ECMI proceedings.

### Thesis

- E. Riccietti, *Numerical methods for optimization problems: an application to energetic districts* - Master Thesis, 2014.

## Teaching

Tutor for the course Calcolo Numerico, degree course in Mechanical Engineering at Università degli Studi Firenze.