Alessandro Rudi

efficient (structured) large scale machine learning with statistical guarantees

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Appointments

Sep 2017 - current   **Researcher**, *INRIA - Sierra team, Paris & École Normale Supérieure, Paris.*

Jan 2017 - Aug 2017   **Post-doc**, *LCSL, Massachusetts Institute of Technology & Italian Institute of Technology*, Fast kernel methods for large scale data, with statistical guarantees..

Jan 2014 - Dec 2016   **Post-doc**, *University of Genova, Italy & LCSL MIT-IIT*. Fast and provably accurate large scale Statistical Machine Learning.

Education

May 2012 - Jan 2013   **Visiting PhD**, *CBCL, Massachusetts Institute of Technology*. Statistical Machine Learning for big data.

Jan 2011 - Apr 2014   **PhD in Machine Learning**, *Italian Institute of Technology, University of Genoa*. Topic: Large-scale Machine Learning with statistical guarantees

Jan 2010 - Jul 2010   **Student Excellence Program**, *Sapienza University of Rome*, Italy.

Oct 2008 - Jul 2010   **Master in Computer Science**, *Sapienza University of Rome*, Italy, *110 cum laude/110*, Machine Learning and Computer Vision.

Oct 2005 - Jul 2008   **Bachelor Degree in Computer Science**, *Roma TRE University*, Rome, Italy, *110 cum laude/110*.

Selected Publications - Machine Learning

(COLT 2018)   **Exponential convergence of testing error for stochastic gradient methods**. L. Pillaud-Vivien, A. Rudi, F. Bach, submitted

NIPS 2017 ORAL   **Generalization Properties of Learning with Random Features**. A. Rudi, L. Rosasco, NIPS 2017

NIPS 2017   **FALKON: An Optimal Large Scale Kernel Method**. A. Rudi, L. Carratino, L. Rosasco, NIPS 2017

NIPS 2017   **Consistent Multitask Learning with Nonlinear Output Relations**. A. Rudi, C. Ciliberto, L. Rosasco, NIPS 2017

NIPS 2016	**A Consistent Regularization Framework for Structured Prediction**. A. Rudi, C. Ciliberto, L. Rosasco, NIPS 2016
AISTATS 2016	**NYTRO: When Subsampling meets Early Stopping**. A. Rudi, R. Camoriano, L. Rosasco, AI and Statistics Conference, AISTATS 2016
NIPS 2015 ORAL	**Less is More: Nyström Computational Regularization**. A. Rudi, R. Camoriano, L. Rosasco, NIPS 2015 ORAL
Book Chap. 2014	**Learning Sets and Subspaces**. A. Rudi, G.D. Canas, E. De Vito, L. Rosasco, Regularization, Optimization, Kernel Methods and Support Vector Machines, Chapman & Hall/CRC Machine Learning Series
NIPS 2013	**On the sample complexity of subspace learning**. A. Rudi, G.D. Canas, L. Rosasco, NIPS 2013
PRL 2013	**Geometrical and computational aspects of spectral support estimation for novelty detection**. A. Rudi, F. Odone, E. De Vito, Pattern Recognition Letters Journal 2014
ROKS 2013	**Subspace learning and empirical operator estimation**. A. Rudi, G.D. Canas, L. Rosasco, Advances in Regularization, Optimization, Kernel Methods and Support Vector Machines, ROKS 2013
ESANN 2012	**Adaptive optimization for cross validation**. A. Rudi, G. Chiusano, A. Verri, European Symposium on Artificial Neural Networks, ESANN 2012

Publications - Computer Vision and 3D reconstruction

CVPR 2011	**A general method for the Point of Regard Estimation in 3D Space**. F.Pirri, M.Pizzoli, A. Rudi, In IEEE Proceedings of Computer Vision and Pattern Recognition 2011, CVPR 2011
ACCV 2010	**Linear Solvability in the Viewing Graph**. A.Rudi, M.Pizzoli, F.Pirri, Asian Conference of Computer Vision 2010, ACCV 2010
SPPRA 2010	**An Approach to Projective Reconstruction from Multiple Views**. A.Rudi, S. Fanello et al., Signal Processing, Pattern Recognition and Applications Conference 2010, SPPRA 2010

Teaching Experience

May 2017	**PhD school Regularization methods in Machine Learning**, *Simula, Oslo*.
Jul 2016	**PhD course on large scale Machine Leaning**, *TUM, Munich*, co-instructor.
Jun 2016, 2015, 2014	**Regularization Methods for Machine Learning**. PhD course on advanced machine learning.
Feb - Jun 2016, 2015, 2014	**Intelligent Systems and Machine Learning 2**, *University of Genoa*. Graduate course on advanced machine learning. TA in 2014, 2015 and co-instructor in 2016
Sep - Dec 2012	**"What is Intelligence?" 9.s912**, *Massachusetts Institute of Technology*. Teaching Assistant. Instructors: Tomaso Poggio, Shimon Ullman
Jan - Jun 2010	**Elective AI: Pattern Recognition**, *Sapienza University of Rome*. co-instructor

Grants & Awards

Jan 2016 - Jan 2017 **180K Grant on Large Scale Nonparametric Learning**, *funded by AirForce - European Division to LCSL at IIT, Italy.*
substantial contribution in finding the funding opportunity and writing the project

Students

Sep 2017 -current **Phd student: Loucas Pillaud-Vivienne**, *INRIA - Paris.*
together with Francis Bach: paper submitted to major ML conference

Jan 2017 - current **Phd students: Luigi Carratino and Gian Maria Marconi**, *Università di Genova.*
1 paper on major ML conference

Jan 2017 - Aug 2017 **Master student (internship): Clement Vignac**, *from Ecòle Polytechnique.*
paper for NIPS 2018 in preparation

Jan 2014 - Dec 2016 **Phd student: Raffaello Camoriano**, *Università di Genova.*
3 papers on major ML conferences

Mar - Jun 2015 **Master student (internship): Thomas Angles**, *from Ecòle Polytechnique.*
paper winning the Ecòle Polytechnique "Research internship award" 2015 as best research internship thesis and published on AISTATS 2016

Mar - Jun 2014 **Master student (internship): Alessio Russo**, from Università di Genova.

Organization

Jun 2016 **Workshop on inverse problems and ML**, *(in conjunction with RegML 2016) 160+ participants* , Speakers: Gad Geiger (MIT), Massi Pontil (UCL), Thomas Vetter (Uni. Basel), Federico Girosi (Uni. Western Sydney & Capital Markets CRC Limited), Alessandro Verri (Uni. Genova).

Jun 2016 **Regularization Methods for Machine Learning (RegML 2016)**, *120 participants, 250+ applications. Instructor: Lorenzo Rosasco. PhD course on advanced machine learning*, `lcsl.mit.edu/courses/regml/regml2016/`.

Jan 2015 **Gaussian Process Winter School**, *Instructor: Neil Lawrence. PhD course on Gaussian processes. 50 participants, 100+ applications.*.

2015 2014 2013 **Machine Learning Seminar Series, UniGe - IIT**.
More than 25 speakers on large scale and real time ML, representation learning, optimization, control. Among them: Jan Peters, Shimon Ullman, Neil Lawrence, Thomas Serre, Laslo Gyorfi, Tomaso Poggio, Alberto Bemporad, Mikhail Belkin, Mauro Maggioni, Marco Cuturi, Gilles Blanchard

Software Development

Jan 2014 - Dec 2016 **Grand Unified Regularized Least Squares**, *LCSL, Massachusetts Institute of Technology*, C++ and Matlab library that implements the state of the art of ML techniques for large-scale supervised learning.
http://lcsl.mit.edu/#/downloads/gurls

Invited Talks

Jan 2018	Workshop: Theoretical and algorithmic underpinnings of Big Data, Newton Institute, Cambridge.
Jan 2018	Quantum computing group, UCL, London.
May 2017	Regularization and Machine Learning school at Simula, Oslo, Norway.
Mar 2017	Bocconi University, Milan, Italy.
Jan 2017	INRIA - Paris, Sierra team.
Dec 2015	NIPS 2015 Oral.
Oct 2015	Mikhail Belkin AI Group at Ohio State University.
Sep 2015	Workshop on inverse problems and ML at RICAM, Austria (by Sergei Pereverzyev).
Aug 2015	Mathematical and Computational Foundations of Learning Theory, Dagstuhl 2015.
Dec 2014	Workshop on Machine Learning and Data Mining 2014.
Nov 2014	Workshop on Humanoids 2014.
Sep 2014	Workshop on Optimization and dynamical processes in statistical learning and inverse problems 2014.
Jul 2014	VVV 2014, Summer school on Humanoid robotics and ML.
Jul 2013	Workshop on Regularization Optimization Kernels and SVMs 2013, speaker.
Apr 2013	University of Siena, Italy.
Dec 2012	CBCL ML Lunch, Massachusetts Institute of Technology, MA.

Expertise

machine learning	approximation techniques for large scale learning problems, advanced statistical machine learning, kernel methods, gaussian processes, spectral methods and inverse problems.
computer vision	structure from motion, stereo vision, multiple view geometry.
mathematics	numerical linear algebra, optimization, advanced probability and statistics, operator theory, functional analysis, spectral theory, harmonic analysis.

Other

Feb - Jan 2009	**Junior Researcher**, *Easy Automation s.r.l*, Rome, Italy. Computer Vision Techniques in the infrared spectrum to analyze glass quality for the Automotive Industry
Sep 2007 - Feb 2008	**Software Engineer**, *Easy Automation s.r.l*, Rome, Italy. Software Developer for different platforms in factory scenarios with multiple robots and machines

Languages

English	Fluent	Italian	Mother Tongue

Computer skills

Programming Languages	C, C++, Python, Java, Javascript, Php	Environments	PyTorch, Matlab, Mathematica, LaTeX

Date: Feb 26th, 2018
Alessandro Rudi