daniele regoli

PhD - theoretical physics

curriculum vitae

via Bellaria 28
40026 Imola (Bologna) Italy

telephone: +39 3921596835
e-mail astapovo@gmail.com, daniele.regoli@sns.it
born on september 15, 1982 in Imola (Bologna), Italy

"live as if you were to die tomorrow. learn as if you were to live forever."
Mohandas Gandhi

what i do now

from October 2013 — Post-doc position at the Quantitative Finance group of the Scuola Normale Superiore, Pisa, for the project "Stability and coherence with the expectations of the market of the long term scenarios used in the management of financial risks" in collaboration with UniCredit Bank.

advisor — Prof. Stefano Marmi

specific project — "Dynamics of the implicit market ratings for sovereign debt emitters"

main results: — building a building a market implied ratings algorithm with 2-dimensional input space via a Support Vector Machine learning method

principal skills/ issues —
– *credit ratings*. Credit Rating Agencies, implied ratings, Credit Default Swaps pricing models
– *credit scoring models*. statistical and learning methods for ratings and bankruptcy prediction
– *machine learning*. Support Vector Machines, Neural Networks, Genetic Algorithms, Clustering
– *credit migration models*. Markov migration models, Hidden Markov models
– *contingent claims analysis*. Merton model, sovereign CCA: Balance sheet analysis for sovereigns, Central Bank's role)
– *R*, *Python* programming

experience

May 2011- May 2013	Post-doc position at the Department of Mathematics of the University of Padova, working on applications of physics and mathematics in economics, finance and social sciences.
advisor	Prof. Paolo Dai Pra
project	"stochastic models for Economics and Finance with long and short term dependences"
main result	finding a simple stochastic interacting system producing an emergent periodic behavior
principal skills/ issues	stochastic processes – emergent behavior – complex systems – mean-field models – default contagion – growth optimal portfolio

education

10/2010- 04/2011	Financial Mathematics: post-graduate course ("corso di alta formazione") at the Mathematics Department of the University of Bologna about mathematical modelization of financial markets.
director	Prof. Andrea Pascucci
issues	stochastic calculus in finance – Matlab programming – numerical methods for partial differential equations – econometrics – financial derivatives – pricing and hedging methods – interest rates – risk management
01/2008- 04/2011	PhD in Theoretical Physics, University of Bologna.
advisor	Dr. Alexander Kamenshchik
research issues	classical cosmology – renormalization group in gravity – (loop) quantum gravity
thesis	"The relation between Geometry and Matter in Classical and Quantum Gravity and Cosmology" (arXiv:1104.2910 [gr-qc]).
keywords	phantom dark energy models – cosmic magnetic fields – PT symmetric Quantum Theory – Loop Quantum Gravity – Spinfoam models for Quantum Gravity
01/2010- 07/2010	six months period of research at the *Centre de Physique Théorique* in Marseille (France), in the Quantum Gravity group led by Prof. Carlo Rovelli.
19/10/2007	Master's degree cum laude in Theoretical Physics, University of Bologna.
thesis	"Reconstruction of potentials in two-field cosmological models"
issue	classical cosmology
advisor	Prof. Giovanni Venturi
co-advisor	Dr. Alexander Kamenshchik

keywords relativistic cosmology – phantom energy – scalar fields – two-field models

14/10/2005 Bachelor's degree cum laude in Physics, University of Bologna.

thesis "Quantum properties of light"

issue quantum optics

advisor Prof. Elisa Ercolessi

keywords quantum optics – coherent states – Wigner quasi-probability distributions

07/2001 Diploma of scientific high school (100/100), Liceo Scientifico Luigi Valeriani, Imola.

computer skills

OS Windows; GNU-Linux: Ubuntu/Red Hat

office Word, Excel, Powerpoint, OpenOffice

scientific numerical simulations and analysis: R, Matlab, Octave, Scilab;
symbolic calculus: Mathematica, Sage

graphics Gimp/Photoshop, Inkscape, Ipe, …

programming Python, (basics of C++)

typesetting LaTeX

languages

- ● italian: native language
- ◐ english: fluent
- ○ french: basic (but improving, hopefully)

professional interests

- ● quantitative methods applied to economics; mathematical finance
- ◐ probability theory and statistical mechanics, mainly applied to economics and social sciences
- ○ (quantum gravity and Group Field Theory)

keywords probability of default – credit ratings – credit default swap – market implied ratings – machine learning – classification analysis – central banks – Markov processes – stochastic differential equations – infinite dimensional dynamical systems – spin systems – long term behavior of collective systems – financial contagion

a few words about what i am working on.

♯ the research project i am involved in, here at the Scuola Normale in Pisa, is in collaboration with (and funded by) UniCredit Group. It deals with looking for smart methodologies to predict/anticipate agency *sovereign ratings* on the basis of market data. Indeed, as it is well known, credit rating agencies are not that timely in updating their 'opinions' on institutions, while the market provides an incredible amount of information, even on short time scales. Given the fundamental role that nowadays ratings have in financial markets, and given the numerous critics to that role and to the mechanism of credit assessment, it is difficult to overestimate the importance of such an issue. Then, broadly speaking, the work i am doing focuses in understanding the entire world of ratings, with particular attention to sovereigns. The actual methodology on which we are focusing is **machine learning** applied to market data (specifically Support Vector Machine, but alternatives are under investigation)

perspectives and aspirations

gershwin: "life is a lot like jazz…it's best when you improvise"

other interests

music (listening, studying, reading…). history. reading (classics, philosophy, art, music, economics, religion,…). writing. art. trees. cooking. cinema. jogging. actually i end up being interested in (almost) everything i do.

schools and collaborations

06/2015 participation to the *Applied Bayesian Statistics (ABS)* school in Como "Modern Bayesian Methods and Computing for the Social Sciences": Bayesian statistics, Hierarchical models, Markov Chain Monte Carlo, JAGS – Professor Jeff Gill, WUSTL.

09/2012 participation to the *Summer School in Probability*, Bologna.

08/2012 participation to the fifth *European Summer School in Financial Mathematics*, held in Paris, École Polytechnique: Optimal Transport and Finance – Professors Filippo Santambrogio and Nizar Touzi; Skorokhod Embedding problems in Finance – Professor Jan Obloj.

07/2011 participation to the Summer School in *"Numerical methods and stochastic calculus in finance"* organized by Scuola Matematica Interuniversitaria (SMI) in Cortona (Italy).

01/2010-07/2010 collaboration with the *Quantum Gravity group* headed by Prof. Carlo Rovelli at the *Centre de Physique Théorique* in Marseille.

21-07/01-08 2008 participation at the *Summer School in Cosmology* organized by the *International Center of Theoretical Physics (ICTP)*, Trieste (Italy).

publications

♭ *preprint* -submitted- S. Marmi, A. Nassigh, and D. Regoli, *"Sovereign ratings implied by coupled CDS-bond market data"* available on SSRN: ssrn.com/abstract=2512238 .

P. Dai Pra, G. Giacomin and D. Regoli, *"Noise-induced periodicity: some stochastic models for complex biological systems"* Mathematical Models and Methods for Planet Earth, Springer INdAM Series 6, 25-35 (2014); DOI: 10.1007/978-3-319-02657-2_3.

P. Dai Pra, M. Fischer and D. Regoli, *"A Curie-Weiss model with dissipation"* Journal of Statistical Physics 152, 1, 37-53 (2013); DOI: 10.1007/s10955-013-0756-2, (arXiv:1305.0288 [math.PR]).

E. Bianchi, D. Regoli and C. Rovelli, *"Face amplitude of spinfoam quantum gravity"* Classical and Quantum Gravity 27, 185009 (2010); DOI: 10.1088/0264-9381/27/18/185009, (arXiv:1005.0764 [gr-qc]).

A. A. Andrianov, F. Cannata, A. Y. Kamenshchik and D. Regoli, *"Phantom Cosmology based on PT-symmetry"*, International Journal of Modern Physics D 19, 97 (2010); DOI: 10.1142/S0218271810016269.

A. A. Andrianov, F. Cannata, A. Y. Kamenshchik and D. Regoli, *"Cosmology of non-Hermitian (C)PT-invariant scalar matter"*, J. Phys. Conf. Ser. 171, 012043 (2009); DOI: 10.1088/1742-6596/171/1/012043.

F. Cannata, A. Y. Kamenshchik and D. Regoli, *"Scalar field cosmological models with finite scale factor singularities"*, Physics Letters B 670, 241-245 (2009); DOI: 10.1016/j.physletb.2008.06.077, (arXiv:0801.2348v1 [gr-qc]). A. A. Andrianov, F. Cannata, A. Y. Kamenshchik and D. Regoli, *"Two-field cosmological models and large-scale cosmic magnetic fields"*, Journal of Cosmology and Astroparticle Physics 10 019 (2008); DOI: 10.1088/1475-7516/2008/10/019, (arXiv:0806.1844v1 [hep-th]).

A. A. Andrianov, F. Cannata, A. Y. Kamenshchik and D. Regoli, *"Reconstruction of scalar potentials in two-field cosmological models"*, Journal of Cosmology and Astroparticle Physics 02 015 (2008); DOI: 10.1088/1475-7516/2008/02/015, (arXiv:0711.4300 [gr-qc]).

teaching

2011/2012 teaching assistant for the class in Statistics of the course of study in Biology at the University of Padova.

Pisa, July 29, 2015

Daniele Regoli

I declare, as per the provision of the law DPR 445/2000, that all the information contained in this document is truthful. I am aware of the rights under Art.13 of law 675/96 and d.lgs. 196/2003 and I consent my personal data to be used solely for selection purposes.

updated on July 29, 2015 · prepared in XeTeX