

Alberto Colliva

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PhD student in Complex Systems in Biology at the University of Turin

🌐 <http://personalpages.to.infn.it/colliva/>

During my studies I developed a strong theoretical background in physics and statistics and learned how to face research challenges in different fields spanning from biology to social and economic sciences. Throughout my PhD I became proficient in using computational methods and tools, especially in python programming and machine learning.

Education

- Oct. 2015 - **PhD in Complex Systems for Life Sciences**, *University of Torino*.
expected 2019 MAIN TOPICS: Network Theory and Models, Monte Carlo Simulations, Bioinformatic, Genome Evolution, Enrichment Analyses, Pattern Recognition, Data Mining
- Apr. 2013 **Master Degree in Physics of Complex Systems**, *University of Torino*,
110/110.
CORE COURSES: Dynamical Systems, Stochastic Processes, Statistical Mechanics, Neural Networks, Complex Systems for Biology, Complex Systems for Social Sciences
- Oct. 2010 **Bachelor Degree in Physics**, *University of Torino*, *91/110*.

Publications

- 2018 A. Colliva, A. Mazzolini, M. Osella, M. Caselle, Global effects of GC content on contact probability from Hi-C data., *under review*
- 2018 A. Mazzolini, A. Colliva, M. Osella, M. Caselle, Heaps' law, statistics of shared components and temporal correlations., *under review*
- 2017 A. Rosanova, A. Colliva, M. Osella, M. Caselle, Modelling the evolution of transcription factor binding preferences in complex eukaryotes., *Sci Rep*. 2017 Aug 8
- 2015 A. Colliva, R. Pellegrini, A. Testori, and M. Caselle, Ising model description of Long Range correlations in DNA sequences *Phys. Rev. E* *91*, 052703

Languages

Italian native

English fluent

IELTS **7.5** - L:8.5, R:8.0, W:6.0, S:6.5 (September 2013)

Key Skills

- MODELING Conceive and develop statistical/predictive models and numerical simulations;
mainly used as null models of neutral evolution.
- DATA ANALYSIS Design procedural algorithms to analyze large volumes of data and identify trends;
experience with genomic data, searched for enriched features or correlation patterns.
- DATA GATHERING Build up query scripts to retrieve data from the web and databases;
using python and basic notions of SQL scripting, web parsing and web scraping.
- DATA INTEGRATION Integrate different data sources and deal with imperfections in data;
such as missing values or inconsistent formatting.
- MACHINE LEARNING Implement simple Neural Networks (multilayer perceptron);
experience with supervised learning.
- STORYTELLING Present complex statistical information in an easy to understand visual format;
developed to convey my results to supervisor and colleagues.

PUBLIC SPEAKING Deliver oral presentations to technical and non-technical audiences;
developed at international scientific conferences and periodic group meetings.

Computer skills

Programming expert in python and C++, knowledge of R, Ruby, Perl, Java, MySQL
Machine Learning Scikitlearn, Tensorflow
Graph Mining Igraph, Networkx, Gephi
Big Data analysis Dask Distributed
Web Development basic knowledge of HTML, CSS, JavaScript, D3.js
Miscellaneous Windows, Linux, LaTeX, Office, GitHub

Others

July 2017 - August 2017 **BIG DIVE: Big data, Machine learning, Data visualization** – TOP-IX, Italy
April 2014 - November 2014 University of Turin (TO), Data Mining on academic success, Term employment contract
Project Work **Forecasting in an ASM:** agent toy-model for forecasting stock prices using neural networks