Serena Bradde

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Summary

I am a creative and highly trained physicist who likes to solve challenges from real-world data by means of analytical and computational techniques. I'm a passionate problem solver with more than 10 scientific papers published interacting with several research groups, I am looking for a position in the industry as part of a collaborative fast-paced team working on real-world problems. I bring to the table a rigorous analytical background as well as a good deal of physical intuition. I have a master understanding of optimisation techniques, inference and statistical physics. I am expert in mathematical methods/mean field modelling, computational algorithms, simulations of agent-based models and proficient in many programming languages. I develop efficient algorithms to perform clustering and motifs search in large data by means of probabilistic graphical models. I have excellent communication and interpersonal skills. Desired position: Research and Data scientist. Desired start date: Fall 2015.

Professional positions

September 2013-Today: Independent Research Fellow at Initiative for the Theoretical Sciences at the Graduate Center, CUNY.
March 2012-September 2013: Doctor Roux-Cantarini Postdoctoral Fellow at Institut Pasteur, Paris, France.
Sept 2010-March 2012: Research Scholar at Memorial Sloan Kettering Cancer Center New York, US

Education

Oct. 2006 - July 2010: PhD. in Statistical Physics at SISSA, Trieste. Thesis: *Statistical Mechanics of the subgraph identification problem.*
Sept. 2004- Jul. 2006: M.S. in Physics at University of Rome, Sapienza. 110/110 cum laude Dissertation: *Inferring DNA sequences from mechanical unzipping data using Statistical Mechanics Method.*
Sept. 2001- Sept. 2004: B.S. in Physics at University of Rome, Sapienza. 110/110 cum laude Dissertation: *Brownian motion, fluctuation dissipation theorem and its violation.*

Experience

- Implemented an algorithm in C that interpolates between hierarchal clustering and K-means to cluster a 50 Giga database of proteins (SCOP) into different families.
- Developed an algorithm in C using statistical physics approximation to identify motifs in metabolic networks of yeast and S cerevisiae (∼1000 of nodes).
- Analysis of the critical properties (such as percolation transition) of complex spatial networks based in relation with its spectral dimension.
- Random matrix theory (Semicircle Law, Tracy-Widom, Marchenko-Pastur) to detect noise from eigenvalues distribution of correlation matrix. Data analysis of time series data using PCA
- Development of analytical techinques to study population dynamics models of co-evolving competitive populations with logistic growth.
- Presented my work at more than 10 international conferences as plenary speaker and in public events of science divulgation, to technical/non technical audiences ranging form 30 to 100 people.
- Teaching assistant and supervisor of 6 graduate students of Cuny for their exam on Basic principle of Theoretical neuroscience course.

Skills

Languages: Italian, maternal language. Excellent knowledge of English, written and oral. Basic knowledge of oral and written French.
Computer skills: C, Matlab, Mathematica, Python, Networkx, awk, good experience with Linux OS and most popular applications.

Selected publications

- S. Bradde, A. Braunstein, H. Mahmoudi, F. Tria, M. Weigt and R. Zecchina
Europhys. Lett., **89**, 37009 (2010).
- S. Bradde, F. Caccioli, L. Dall'Asta and G. Bianconi
Phys. Rev. Lett., **104**, 218701 (2010).
- V. Bucci*, S. Bradde*, G. Biroli and J.B. Xavier
PloS Computational Biology **8**(4):e1002497 (2012).
- S. Taheri-Araghi*, S. Bradde*, J. T. Sauls, N. S. Hill, P. A. Levin, J. Paulsson, M. Vergassola, S. Jun
Current Biology, **25**, 385 (2015).