

Application to the ... position ...
at ...

Stéphane Ghazzi

April 24, 2020

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Stéphane Ghozzi



Data scientist with a training in theoretical physics, interested in analyzing, visualizing and interpreting data in close collaboration with data owners and users. Works in teams to apply machine learning methods and develop interactive dashboards.

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Experience

Research assistant

Robert Koch Institute

April 15, 2016 – present · 4 yrs

Berlin, Germany

rki.de/signale-project

Machine learning, informatics, statistics and visualizations, Signale team, Department of Infectious-Disease Epidemiology.

Research and development:

- development of outbreak-detection algorithms and modelling of infection dynamics;
- performance evaluation and parameter optimization of the algorithms;
- natural language processing of online articles to support international infectious-disease surveillance;
- interactive visualizations of the results and other data for public-health professionals.

Management and organization:

- speaker for the team (four data scientists, two web developers, an average of two students);
- coordination of the international Topic Group Outbreaks under the Focus Group AI for Health of ITU and WHO: itu.int/en/ITU-T/focusgroups/ai4h/Pages/tg.aspx
- supervision of master theses;
- organization of workshops and hackathons;
- writing of grant applications.

World Health Organization

May 1, 2019 – October 31, 2019 · 6 mos

Geneva, Switzerland

who.int/eios · who.int/emergencies/outbreak-toolkit

Machine learning and web-application development for epidemic intelligence and investigation of outbreaks of unknown origins.

In the Detection, Verification and Risk Assessment (DVA) and the Health Operations Monitoring and Data Collection (MDC) units of the Health Emergency Information and Risk Assessment (HIM) department within the WHO Health Emergencies (WHE) program of WHO.

Visual artist	<p>self employed March 1, 2012 – April 14, 2016 · 4 yrs 1 mo Berlin, Germany stephaneghozzi.com/works Drawing, generative animation, photography, video, computer animation.</p>
	<p>Selected projects and collaborations:</p> <ul style="list-style-type: none"> · 2014: videos exhibited during the <i>backup</i> festival, E-Werk, Weimar; · 2005: twelve illustrations for <i>Trace.project</i>, a compilation album of original electronic music; · 2005: videography for the dance piece <i>Entre-Deux</i> by Mirjam Fruttiger, Paris and Rome (including one-week invitation at the Villa Médicis); · 2004: videography on the documentary <i>Manchay Tiempo</i> by Florence Blum and María Pía Medina-Luna (four-weeks filming in Peru); · 2002: drawings and photographs published in the magazine <i>R de réel</i>.
Postdoctoral researcher	<p>Institute for Theoretical Physics, Cologne University March 1, 2010 – February 29, 2012 · 2 yrs Cologne, Germany www.thp.uni-koeln.de/~lassig Statistical and mechanical models of biological evolution, in the Lässig group.</p>
	<p>Mathematical model and analysis of bacterial growth and gene expression, interpretation of experimental results.</p> <p>Signatures of selection in DNA sequences and comparison with population genetics models:</p> <ul style="list-style-type: none"> · long-term influenza evolution; · transcription-binding-site motifs in yeast. <p>Co-evolution signatures in protein sequences.</p>
Teaching assistant	<p>Cologne University September 1, 2010 – January 30, 2012 · 1 yr 5 mos Cologne, Germany Mathematics and statistical physics for Bachelor students.</p>
	<p>UPMC Sorbonne Universities October 1, 2005 – August 31, 2009 · 3 yrs 11 mos Paris, France Thermodynamics, optics and waves, mathematical methods for Bachelor students.</p>
Doctoral researcher	<p>Laboratory of Statistical Physics, École normale supérieure September 1, 2005 – December 31, 2009 · 4 yrs 4 mos Paris, France www.labos.upmc.fr/ljp/?article7 · www.lps.ens.fr Theoretical and experimental biophysics: Dynamics of gene regulatory networks, in the Chatenay group (now at Laboratoire Jean Perrin).</p>

Won a 60 k€ grant to fund the experimental project (over 3 years, used to buy apparatus and consumables): program “Interface physique, biologie et chimie : soutien à la prise de risque 2007-2009” of the CNRS.

Time series of gene expression levels, via fluorescent microscopy, of the lysis-lysogeny decision network of the bacteriophage Lambda:

- molecular biology (extraction of viral genes, insertion of genes coding for fluorescent protein, modification of bacterial genomes);
- microbiology (bacterial and viral cultures);
- automation and fluorescent microscopy;
- image analysis.

Mathematical analysis of noise statistics of bacterial gene expression.

Computer simulations of the dynamics and evolution of gene regulatory networks.

**Volunteering
Founding
member**

Celsius

August 1, 2007 – August 31, 2009 · 2 yrs 1 mo

Paris, France

Celsius was a think tank with the goal of developing the European project.

- Elaboration of background documents on technical themes;
- preparation, organization of, and follow-up on, two-days meetings in Madrid, Brussels, and Paris, each with more than 30 participants;
- development of publication strategies, print and online.

Internships

Laboratoire de l’Accélérateur Linéaire, Université Paris-Sud

February 1, 2005 – March 31, 2005 · 2 mos

Orsay, France

Theoretical particle physics, in the Davier group: Computation of fundamental physical quantities for high energy physics from particle collision experiments data.

DESY, Humboldt-Universität zu Berlin

January 17, 2003 – August 31, 2003 · 7 mos

Zeuthen, Germany

Theoretical particle physics, in the Jegerlehner group: Analysis of experimental data with ad hoc and first-principle mathematical models of elementary particles.

Laboratoire Kastler Brossel, École normale supérieure

June 1, 2002 – August 31, 2002 · 3 mos

Paris, France

Experimental quantum physics, in the Grynberg group: Construction of an optical atom trap.

Education

Certifications Coursera

January 1, 2016 – March 31, 2016 · 3 mos

Practical Predictive Analytics: Models and Methods
Machine Learning
Data Manipulation at Scale: Systems and Algorithms

Ph.D.	École normale supérieure September 1, 2005 – December 31, 2009 · 4 yrs 4 mos Paris, France Theoretical and experimental biophysics: Dynamics of gene regulatory networks. See “Experience” above for details.
B.Sc. & M.Sc.	École normale supérieure September 1, 2001 – August 31, 2005 · 4 yrs Paris, France Theoretical and mathematical physics: specialization in particle physics and statistical physics. Competitive fellowship. Activities and societies: President of the Photography and Video-Making student associations in 2002 and 2003: <ul style="list-style-type: none">· presenting, defending, and managing budgets;· initiation and support for members.
M.A.	École nationale supérieure des arts décoratifs September 1, 2003 – August 31, 2004 · 1 yr Paris, France CGI, 3d animation, post-production.

Skills

Programming	R, Python, LaTeX, Mathematica, Matlab, Processing (Java), SQL, Perl, C++, Shell
Tools	Git, Team Foundation Server (agile management: Scrum, Kanban), Photoshop, Illustrator, After Effects, Microsoft Office, 3ds Max, Blender
Languages	French (native) German (professional) English (professional) Japanese (basics)

Publications

- [1] O. Stojanović, J. Leugering, G. Pipa, S. Ghozzi, and A. Ullrich, “A Bayesian Monte Carlo approach for predicting the spread of infectious diseases,” *PLOS ONE*, vol. 14, no. 12, pp. 1–20, 12 2019. [Online]. Available: <https://doi.org/10.1371/journal.pone.0225838>

- [2] A. Abbood, A. Ullrich, R. Busche, and S. Ghazzi, “EventEpi — A Natural Language Processing Framework for Event-Based Surveillance,” *medRxiv*, 2019. [Online]. Available: <https://doi.org/10.1101/19006395>
- [3] B. Zacher, A. Ullrich, and S. Ghazzi, “Supervised Learning for Automated Infectious-Disease-Outbreak Detection,” *Online Journal of Public Health Informatics*, vol. 11, no. 1, 2019. [Online]. Available: <https://doi.org/10.5210/ojphi.v11i1.9770>
- [4] F. Eckelmann, S. Ghazzi, and A. Ullrich, “Dashboards as strategy to integrate multiple data streams for real time surveillance,” *Online Journal of Public Health Informatics*, vol. 11, no. 1, 2019. [Online]. Available: <https://doi.org/10.5210/ojphi.v11i1.9701>
- [5] N. Sarma, A. Ullrich, H. Wilking, S. Ghazzi, A. K. Lindner, C. Weber, A. Holzer, A. Jansen, K. Stark, and S. Vygen-Bonnet, “Surveillance on speed: Being aware of infectious diseases in migrants mass accommodations - an easy and flexible toolkit for field application of syndromic surveillance, Germany, 2016 to 2017,” *Eurosurveillance*, vol. 23, no. 40, 2018. [Online]. Available: <https://doi.org/10.2807/1560-7917.ES.2018.23.40.1700430>
- [6] L. Perfeito, S. Ghazzi, J. Berg, K. Schnetz, and M. Lässig, “Nonlinear Fitness Landscape of a Molecular Pathway,” *PLOS Genetics*, vol. 7, no. 7, pp. 1–10, 07 2011. [Online]. Available: <https://doi.org/10.1371/journal.pgen.1002160>
- [7] S. Ghazzi, J. Wong Ng, D. Chatenay, and J. Robert, “Inference of plasmid-copy-number mean and noise from single-cell gene expression data,” *Phys. Rev. E*, vol. 82, p. 051916, Nov 2010. [Online]. Available: <https://doi.org/10.1103/PhysRevE.82.051916>
- [8] S. Ghazzi, “Expression Dynamics of a Genetic Regulatory Network: the Lysis/Lysogeny Decision of Bacteriophage Lambda,” Theses, Université Pierre et Marie Curie - Paris VI, Dec. 2009. [Online]. Available: <https://tel.archives-ouvertes.fr/tel-00515109>
- [9] S. Ghazzi and F. Jegerlehner, “Isospin violating effects in e^+e^- vs. τ measurements of the pion form factor $|F_\pi|^2(s)$,” *Physics Letters B*, vol. 583, no. 3, pp. 222 – 230, 2004. [Online]. Available: <https://doi.org/10.1016/j.physletb.2004.01.021>

Cover letter

Dear Madam, dear Sir,

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Stéphane Ghazzi

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Research summary

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Referees

1st referee

Referee 1

Title

Department

Institution

Street 0, 00000 City, Country

mail@mail.com

Relationship to referee 1.

2nd referee

Referee 2

Title

Department

Institution

Street 0, 00000 City, Country

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Relationship to referee 2.