

# Simone Pernice

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## Curriculum Vitae

### Personal information

**Current position:** Ph.D. Student at the Department of Computer Science in the Università degli Studi di Torino

### Interests

- Stochastic Process
- Mathematical modeling
- Application of stochastic models for systems biology
- Optimization problems
- Theory and application of (Stochastic) Petri Nets (Generalized Stochastic Petri Nets, Stochastic Symmetric Nets)
- Mean Field Theory

### Education

Oct 2017 - Oct 2020 **Ph.D. in Computer Science**, *Department of Computer Science, Scuola di Scienze della natura dell' Università degli Studi di Torino, Italy.*

My Ph.D. is financed by winning a national doctoral grant.  
Supervisors: Beccuti M. and Cordero F.

Jul 2020 **Percorso 24 CFU**, *CIFIS - Formazione degli insegnanti in Piemonte*, 24 CFU (crediti formativi universitari) in the anthro-psycho-pedagogical field and in teaching methodologies and technologies, in order to access teaching in secondary schools. Exams: i) Didattica, Tecnologie e Ricerca Educativa, ii) Aspetti affettivi e relazionali dei gruppi nel contesto scolastico, iii) Pedagogia della scuola e dell'inclusione e iv) Psicologia dell'educazione e dell' apprendimento in contesti scolastici..

15<sup>th</sup> Dec 2016 **M.A. Mathematics: probability and statistics (Laurea LM40-45S)**, *Dipartimento di Matematica "G.P.", Scuola di Scienze della natura dell' Università di Torino, Italy.*

Title: *Analysis of Markovian agent models through Fluid approximation*  
Supervisors: Beccuti M., Balbo G. and Sirovich R.  
Degree: 110/110 cum laude

13<sup>th</sup> Oct 2014 **B.S. Mathematics (Laurea L35-Classe 32)**, *Dipartimento di Matematica "G.P.", Scuola di Scienze della natura dell' Università di Torino, Italy.*

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## Teaching experience

- Nov 2020 - **Teaching Assistant**, Tutoring at the course Elementi di Probabilità e Statistica (mfn0600) del Dipartimento di MATEMATICA "G.Peano", corso di laurea in Informatica dell' Università di Torino", 25hrs.  
Now
- Nov 2020 - **Teaching Assistant**, Tutoring at the course Elaborazione Informatica dei dati sperimentali modulo STATISTICA del Dipartimento di Biotecnologie Molecolari e Scienze della Salute, corso di laurea in Biotecnologie dell' Università di Torino", 24hrs.  
Now
- Sept 2020 - **Teaching Assistant**, Tutoring at the course Elaborazione Informatica dei dati sperimentali modulo INFORMATICA del Dipartimento di Biotecnologie Molecolari e Scienze della Salute, corso di laurea in Biotecnologie dell' Università di Torino", 24hrs.  
Nov 2020
- Jan, Feb, Sept 2020 **Teaching Assistant**, Tutoring at the course Elementi di Probabilità e Statistica del Dipartimento di MATEMATICA "G.Peano", corso di laurea in Informatica dell' Università di Torino", 16hrs.
- Nov 2019 - **Teaching Assistant**, Tutoring at the course Elaborazione Informatica dei dati sperimentali modulo STATISTICA del Dipartimento di Biotecnologie Molecolari e Scienze della Salute, corso di laurea in Biotecnologie dell' Università di Torino", 24hrs.  
Feb 2020
- Oct 2018 - Feb 2019 **Teaching Assistant**, Tutoring at the course Matematica e Biostatistica con Applicazioni Informatiche del Dipartimento di Biotecnologie Molecolari e Scienze della Salute, corso di laurea in Biotecnologie dell' Università di Torino" (INT0824), 40hrs.
- Sept 2013 - **Teaching Assistant**, Tutor at the preparatory course for the university entering students at " Dipartimento di Matematica "Giuseppe Peano" dell' Università di Torino", 20hrs.  
Nov 2013

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## Professional experience

- 23<sup>th</sup> May 2019 - 21<sup>th</sup> Oct 2019 **Visiting scholar in Cambridge (UK)** , Visiting scholar in the University of Cambridge, Department of Computer Science and Technology (Cambridge, United Kingdom)., Title of the project: "Exploiting the Colored Petri Net to combine the Flux Balance Analysis with kinetic models based on Differential Equations".  
Supervisors: Full professor Pietro Lió (Full Professor of Computational Biology at the department of Computer Science and Technology of the University of Cambridge) and Assistant Prof. Marco Beccuti (Dept. of Computer Science of University of Turin).
- March 2018 **Spring School**, Bertinoro International Spring School for Graduate Studies in Computer Science 2018.
- Jul 2017 - **Scholarship**, Three months scholarship on the project: "Metodi per l'analisi delle prestazioni e dell'affidabilità del centro di calcolo", at the Department of Computer Science in the Università degli Studi di Torino.  
Oct 2017
- Sept 2015 - **Erasmus**, Participation at Erasmus program at the University of Wroclaw, Poland.  
March 2016
- Feb 2015 - **Part time job for the University**, Dipartimento di Matematica "Giuseppe Peano" dell' Università di Torino.  
Jun 2015  
Working in the library.

## Oral presentation

- 17<sup>th</sup> – 20<sup>th</sup> Jul 2020 **eRum 2020**, Virtual presentation at the European R users meeting (eRum 2020) 17-20 July 2020, Milan, Italy.  
Title: "CONNECTOR: a computational approach to study intratumor heterogeneity."
- 04<sup>th</sup> – 06<sup>th</sup> Sept 2019 **CIBB 2019**, Oral presentation at the 16th International Conference on Computational Intelligence methods for Bioinformatics and Biostatistics (CIBB2019), 04-06 September 2019, Bergamo, Italy.  
Title: "Multiple Sclerosis disease: a computational approach for investigating its drug interactions"
- 11<sup>th</sup> Gen 2019 **DIPINFO si racconta 2019**, Oral presentation at the workshop of the Computer Science Department "DIPINFO si racconta", 10-11 Genuary and 05-06 Febraury 2019, Turin, Italy.  
Title: "Analisi della Sclerosi Multipla usando Reti di Petri."
- 27<sup>th</sup> Aug 2018 **EURO-PAR 2018**, Oral presentation at the workshop on Advances in High-Performance Bioinformatics organised during the 24<sup>th</sup> International European Conference on Parallel and Distriuted Comuting (EURO-PAR 2018), August 27-31, 2018, Turin, Italy.  
Title: "GPU accelerated analysis of Treg-Teff cross regulation in relapsing-remitting multiple sclerosis"
- 29<sup>th</sup> Jun 2018 **BITS 2018**, Oral presentation at the 15<sup>th</sup> Annual Meeting of the Bioinformatics Italian Society (BITS 2018) June 27-29, 2018, University of Turin, Italy.  
Title: "Connector: A computational approach to study intratumor heterogeneity."

## Services to the community

- 2020 Reviewer for the **Performance Evaluation** Journal.  
Reviewer to the 17<sup>th</sup> IEEE International Conference on Computational Intelligence in Bioinformatics and Computational Biology, (**CIBCB2020**).
- 2019 Reviewer for the **BMC bioinformatics** journal.  
Reviewer to the 3<sup>rd</sup> International Workshop on Computational Methods for the Immune System Function, (**CMISF2019**).
- Reviewer to the 16<sup>th</sup> International Conference on Computational Intelligence methods for Bioinformatics and Biostatistics, (**CIBB2019**).
- Subreviewer to the 16<sup>th</sup> IEEE International Conference on Computational Intelligence in Bioinformatics and Computational Biology, (**CIBCB2019**).
- Reviewer to the 27<sup>th</sup> Euromicro International Conference on Parallel, Distributed, and Network-Based Processing, (**PDP2019**).
- 2018 Subreviewer to the 9<sup>th</sup> ACMa Conference on Bioinformatics, Computational Biology, and Health Informatics, (**ACMa BCB 2018**).

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## Scientific publications

### In Refereed International Journals:

2020

1. P. Castagno, S. Pernice, G. Ghetti, M. Povero, L. Pradelli, D. Paolotti, G. Balbo, Matteo Sereno, Marco Beccuti. A computational framework for modeling and studying pertussis epidemiology and vaccination. BMC Bioinformatics 21, 344 (2020). <https://doi.org/10.1186/s12859-020-03648-6>
2. S. Pernice, P. Castagno, L. Marcotulli, M. M. Maule, L. Richiardi, G. Moirano, M. Sereno, F. Cordero, M. Beccuti. Impacts of Reopening Strategies for COVID-19 Epidemic: A Modeling Study in Piedmont Region. BMC Infectious Diseases. 20, 798 (2020). <https://doi.org/10.1186/s12879-020-05490-w>
3. S. Pernice, L. Follia, A. Maglione, M. Pennisi, F. Pappalardo, F. Novelli, M. Clerico, M. Beccuti, F. Cordero, S. Rolla. Computational modeling of the immune response in Multiple Sclerosis using Epimod framework. BMC Bioinformatics. (Accepted and to be published)

### 2019

4. S. Pernice, L. Follia, G. Balbo, M. Luciano, G. Sartini, N. Totis, P. Lio I. Merelli, F. Cordero and M. Beccuti; ***Integrating Petri nets and Flux Balance methods in computational biology models: a methodological and computational practice.*** October 2019. Fundamenta Informaticae 171(1-4):367-392. DOI: 10.3233/FI-2020-1888
5. S. Pernice, M. Pennisi, G. Romano, A. Maglione, S. Cutrupi, F. Pappalardo, G. Balbo, M. Beccuti, F. Cordero and R. A. Calogero; ***A computational approach based on the Colored Petri Net formalism for studying Multiple Sclerosis.*** December 2019. BMC Bioinformatics 20(S6). DOI: 10.1186/s12859-019-3196-4.

### In Proceeding of Refereed International Conferences/Workshops:

### 2020

1. S. Pernice, M. Beccuti, G. Romano, M. Pennisi, A. Maglione, S. Cutrupi, F. Pappalardo, L. Capra, G. Franceschinis, M. D. Pierro, G. Balbo, F. Cordero and R. A. Calogero. ***Multiple Sclerosis disease: a computational approach for investigating its drug interactions.*** Proceedings of the 16<sup>th</sup> International Conference on Computational Intelligence methods for Bioinformatics and Biostatistics, (CIBB 2019). Bergamo, Italy, September 04-06 2019. (To be published)

### 2019

2. S. Pernice, G. Romano, G. Russo, M. Beccuti, M. Pennisi and F. Pappalardo. ***Exploiting Stochastic Petri Net formalism to capture the Relapsing Remitting Multiple Sclerosis variability under Daclizumab administration.*** 2019 IEEE International Conference on Bioinformatics and Biomedicine (BIBM), San Diego, CA, USA, 2019, pp. 2168-2175. DOI: 10.1109/BIBM47256.2019.8983368.

3. L. Capra, M. Beccuti, M. D. Pierro, L. Follia, G. Franceschinis and S. Pernice. ***A Tool for the Automatic Derivation of Symbolic ODE from Symmetric Net Models***. Proceedings of the 27<sup>th</sup> IEEE International Symposium on the Modeling, Analysis, and Simulation of Computer and Telecommunication Systems, (MASCOTS 2019). Rennes, France, October 22-25 2019. Pp. 36-48. DOI: 10.1109/MASCOTS.2019.00015.
4. G. Piaggieschi, N. Licheri, G. Romano, S. Pernice, L. Follia and G. Ferrero, ***MethylFASTQ: a tool simulating bisulfite sequencing data***. Proceedings of the 27<sup>th</sup> Euromicro International Conference on Parallel, Distributed, and Network-Based Processing (PDP 2019).

## 2018

5. S. Pernice, M. Beccuti, P. Do', M. Pennisi, and F. Pappalardo, ***Title Estimating Daclizumab effects in Multiple Sclerosis using Stochastic Symmetric Nets***. IEEE 2nd International Workshop on Computational Methods for the Immune System Function (CMISF 2018) conference proceedings, 3-6 December 2018, Madrid, Spain.
6. M. Beccuti, L. Capra, M. De Pierro, G. Franceschinis and S. Pernice, ***Deriving Symbolic Ordinary Differential Equations from Stochastic Symmetric Nets without unfolding***. Volume 11178 LNCS, 2018, Pages 30-45 15<sup>th</sup> European Performance Engineering Workshop, EPEW 2018, 29-30 October 2018, Paris, France. ISBN: 978-303002226-6.
7. M. Beccuti, P. Cazzaniga, M. Pennisi, D. Besozzi, M. S. Nobile, S. Pernice, G. Russo, A. Tangherloni and F. Pappalardo, ***GPU accelerated analysis of Treg-Teff cross regulation in relapsing-remitting multiple sclerosis***. Proceedings of the 24<sup>th</sup> International European Conference on Parallel and Distributed Computing Workshops (Euro-Par 2018), 27-31 August 2018, Turin, Italy.
8. L. Follia, F. Tordini, S. Pernice, G. Romano, G.B. Piaggieschi, G. Ferrero, ***ParallNormal: An Efficient Variant Calling Pipeline for Unmatched Sequencing Data***. Proceedings of the 26<sup>th</sup> Euromicro International Conference on Parallel, Distributed, and Network-Based Processing (PDP 2018), pages 423-429, Cambridge, United Kingdom, 21-23 March 2018. ISBN: 978-153864975-6.

## In refereed International Conferences

## 2018

1. S. Pernice, J. Giordano, R. Sirovich, M. Arigoni, J. Erriquez, M. Beccuti, M. Olivero, F. Cordero, M. F. Di Renzo, and R. A. Calogero, ***Connector: A computational approach to study intratumor heterogeneity***. 15<sup>th</sup> Annual Meeting of the Bioinformatics Italian Society (BITS 2018) 27-29 June 2018, University of Turin, Italy.

Poster:

**2019**

1. L. Follia, M. Ferrero, G. Ferrero, S. Pernice, G. Dalmaso, L. Visentin, R. Sirovich and F. Cordero; ***Mathematical evolutionary cancer models: a new frontier for cancer treatment.*** BITS annual meeting 2019. Palermo, Italy June 26-28, 2019.

**2018**

2. P. Castagno, S. Pernice, M. Povero, G. Ghetti, L. Pradelli, D. Paolotti, A. Tozzi, M. Beccuti, M. Sereno; ***A computational model for studying the effects of different vaccine policies on pertussis epidemiology.*** BITS annual meeting 2018. Turin, Italy June 27-29, 2018.

**Participation in committees**

**Program Committee**, PC member of *Advances in High-Performance Bioinformatics and Biomedicine (PDP2019)*.

27-29 Jun 2018 **Local Committee**, Member of the local committee at the 15<sup>th</sup> Annual Meeting of the Bioinformatics Italian Society (BITS 2018) June 27-29, 2018, University of Turin, Italy.

**Computer skills**

Basic C++, Visual Basic Excel, Geogebra  
Intermediate MATLAB, L<sup>A</sup>T<sub>E</sub>X, OpenOffice  
Advanced R

**Languages**

Italian **Mothertongue**  
English **Intermediate** *Good English communication skills gained through my experiences as visiting PhD student in Cambridge, UK, and as Erasmus student in Wroclaw, PL*