

MATTEO PETROSINO

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EDUCATION

Ph.D. student in Biostatistics and Public Health * * *

University of Milano Bicocca, Department of Medicine, (Monza, Italy).

📅 2020-present



M.Sc. in "Stochastics and Data Science" (LM40) **

University of Torino, Department of Mathematics "Giuseppe Peano", (Torino, Italy).

📅 2016-2019

Thesis' title: "A new version of the IP-algorithm adapted to SBFC-model: network dynamics of misinformation spreading".

Bachelor's degree in "Statistica Matematica e Trattamento Informatico dei Dati" - SMID (L35) *

University of Genova, Department of Mathematics DIMA, (Genova, Italy).

📅 2012-2006

Thesis' title: "Multidimensional Item Response Theory: un esempio applicativo".

EDUCATIONAL WORK EXPERIENCES

- **Research grant** (01/04/2020 - 31/10/2020)
Dipartimento di Medicina e Chirurgia (School of Medicine and Surgery), Università degli Studi di Milano-Bicocca
Project topic: "Sistemi dinamici e di machine learning per la pianificazione e l'analisi di studio su biomarkers."
- Private lessons for high school and university students (2011 - present)

OTHER EXPERIENCES

- Poster presentaion *Assessing the role of hyperventilation in patients with traumatic brain injury: longitudinal data analysis from the CENTER-TBI @ "42nd Annual Conference of the International Society for Clinical Biostatistics (ISCB)", 19/07/2021, Lyon.*
- Speaker on *Modeling misinformation spreading via mean field equations and an algorithm to shape influence and passivity of users within a social network @ "First Young Math Researchers", 08/11/2019, Department of Mathematics (DIMA), University of Genova.*

PUBLICATIONS

- Citerio G., Robba C., Rebora P., Petrosino M., Rossi E., Malgeri L., Stocchetti N., Galimberti S., K. Menon D.K. (2021). *Management of arterial partial pressure of carbon dioxide in the first week after traumatic brain injury: results from the CENTER-TBI study.* Intensive Care Medicine volume 47, 961–973. [10.1007/s00134-021-06470-7](https://doi.org/10.1007/s00134-021-06470-7)
- Passarelli, M., Masini, M., Bracco, F., Petrosino, M., Chiorri, C. (2018). *Development and validation of the Facial Expression Recognition Test (FERT).* Psychological Assessment, 30(11), 1479–1490. <https://doi.org/10.1037/pas0000595>

LANGUAGES

Italian - Mother tongue

English

French



PROGRAMMING SKILLS

R/R studio

SQL

C++

SAS

Python

Latex



MAIN EXAMS

- metodi di analisi della sopravvivenza * * *
- graphical models for categorical data with R * * *
- causal diagrams * * *
- statistical inference **
- probability theory **
- stochastic processes **
- bayesian statistics **
- statistics for stochastic processes (*time series: theory and analysis*) **
- stochastic modelling for statistical applications **
- multivariate statistical analysis **
- analisi matematica (I,II,III) *
- algebra lineare e geometria analitica *
- probabilità (I,II) *
- statistica descrittiva (I,II) *
- statistica inferenziale *
- missing data * * *
- longitudinal data analysis * * *
- joint models: frequentist and bayesian approach * * *
- statistical machine learning **
- programming for data science (R software) **
- econometrics **
- complex networks **
- database and algorithms **
- stochastic differential equations **
- functional analysis **
- databases and algorithms **
- programmazione I (C++) *
- biostatistica *
- elementi di machine learning *
- statistica matematica (I,II) *
- fisica I *

THESIS WORKS

"A new version of the IP-algorithm adapted to SBFC-model: network dynamics of misinformation spreading".

The project I proposed consisted of the modification of a stochastic diffusion compartmental model (developed for a PhD thesis in 2017) of a fake news and its debunk spreading within an idealized network (Erdős – Rényi random graphs and Barabasi-Albert model graphs) with the aim of evaluating the new possible diffusion dynamics. The theoretical framework considered techniques borrowed from epidemiology, suitable to study this kind of diffusion within a dynamical system. I therefore attributed two personal traits to the users, the influence and the passivity, which were missing in the previous model, seen as an "attractive" force and a "repulsive" one, respectively, along with spreading process, in order to have distinguishable users within the three compartments (Believer-Fact Checker-Susceptible). These, were updated at each iteration of the system by means of an algorithm developed by myself, with logics adapted to users' allowed state transitions. I entrusted an active role in the information dissemination dynamics to the measures of influence and passivity, using them as terms of a modified set of equations of the original model (SBFC). The evolution of the system dynamics has been simulated with the use of R software. I found that the new dynamics were dependent of the initial probability densities where the starting values of the levels of influence and passivity of users were sampled from; needed to initialize the stochastic diffusion.

"Multidimensional Item Response Theory: un esempio applicativo".

I collaborated within a research project of the Department of Education of the University of Genoa (DiSFor) concerning the construction of a psychological test aimed at recognizing "Ekman's five emotions" starting from facial expressions (produced by actors). My work has focused on statistical validation, with Bayesian inference methods, regarding the incidence and dimensionality of some psychological constructs on the process of recognizing emotions in order to estimate the ability of an individual. The theoretical framework was identified in the multidimensional item response theory (MIRT). This project was followed by a publication reported in this CV. This experience was largely formative for my path getting a first contact with the world of scientific research and giving me the opportunity to shape the future of my studies.

A handwritten signature in black ink, consisting of the letters 'M', 'F', and 'A' in a stylized, cursive font.