

Massimiliano Russo

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Current position

Postdoctoral research fellow, *Harvard Medical School program in Therapeutic Sciences within the Harvard-MIT Center for Regulatory Science*, I am also part of Prof. Lorenzo Trippa's group at the Dana-Farber Cancer Institute (DFCI) department of Data Science.

Research interests Analysis and design of clinical trials; Decision theory; Bayesian nonparametrics; Tensor factorization; Categorical data; Complex data; Hierarchical models; Models for latent variables; Machine learning and Data mining; Computational statistics.

Education

- 2015–2019 **PhD in Statistical Sciences**, *University of Padova, Dept. of Statistical Sciences*, Thesis: *Bayesian inference for tensor factorization models*.
Advisor: [Bruno Scarpa](#)
- 2013–2015 **Master in Statistical Sciences**, *University of Padova, Dept. of Statistical Sciences*, Final Mark: 110/110 cum laude,
Thesis: *Olfactory perception differences in Italian regions: a nonparametric Bayesian approach to tensor factorization*.
Advisor: [Bruno Scarpa](#); Co-advisor: Giancarlo Ottaviano
- 2009–2013 **Bachelor in Statistical and Actuarial sciences**, *Università degli Studi del Sannio, Benevento*, Final Mark: 110/110 cum laude,
Thesis: *Multivariate robust estimation*.
Advisor: [Luca Greco](#)

Awards

- Best poster award, second place winner for "Inference in Response-Adaptive Clinical Trials When the Enrolled Population Varies Over Time", ASA Biopharmaceutical Section Regulatory-Industry Statistics Workshop 2020
- Best paper award for "Bayesian Inference on Group Differences in Multivariate Categorical Data" Dept. of Statistical Sciences, University of Padova (Research Prize 2018)
- Winner of the *3 minutes thesis competition* selection of Dept. of Statistical Sciences, University of Padova, October 19, 2018.
- Young researcher travel award ISBA2018, Edinburgh, United Kingdom.
- Travel support for COBAL V (2017), Guanajuato, Mexico
- Young researcher travel award ISBA2016, Sardinia, Italy.

Academic experience

Published papers
refereed journals

Russo, M., Ventz, S., Wang, V., Trippa, L., *Inference in response-adaptive clinical trials when the enrolled population varies over time*, Biometrics, accepted for publication, 2021.

DOI: 10.1111/biom.13582

Aliverti, E. and Russo M., *Stratified stochastic variational inference for high-dimensional network factor model*, Journal of Computational and Graphical Statistics, accepted for publication, 2021.

DOI: 10.1080/10618600.2021.1984929

Russo, M., Singer, B. H. & Dunson, D. B., *Multivariate mixed membership modeling: Inferring domain-specific risk profiles*, The Annals of Applied Statistics, accepted for publication.

DOI: 10.1214/21-AOAS1496

Rigon, T., Aliverti, E., Russo, M., and Scarpa, B., *A discussion on: Centered partition processes: Informative priors for clustering* by Paganin, S., Herring, A. H., Olshan, A. F. and Dunson, D. B., Bayesian Analysis 16(1): 301-370, 2021.

DOI: 10.1214/20-BA1197

Ottaviano, G., Nardello, E., Pendolino, A. L., Pozza, M. D., Russo, M., Savietto, E. Peter, J. A., Ermolao, A., *Nasal Function Changes at High Altitude*, American Journal of Rhinology & Allergy, 34(5) 618-625, 2020.

DOI: 10.1177/1945892420916393

Aliverti, E., Paganin, S., Rigon, T. and Russo, M., *A discussion on: Latent nested nonparametric priors* by Camerlenghi, F., Dunson, D.B., Lijoi, A., Prünster, I. and Rodriguez, A., Bayesian Analysis, 14 (4) 1303 - 1356, 2019.

DOI: 10.1214/19-BA1169

Ottaviano, G., Pendolino, A. L., Nardello, E., Maculan, P., Martini, A., Russo, M. and Lund, V. J., *Peak nasal inspiratory flow measurement and visual analogue scale in a large adult population*, Clinical Otolaryngology; 44: 541–548, 2019.

DOI:10.1111/coa.13329

Russo, M., Durante, D. & Scarpa, B., *Bayesian Inference on Group Differences in Multivariate Categorical Data*, Computational Statistics & Data Analysis. 126, 136-149, 2018.

DOI:10.1016/j.csda.2018.04.010

Cantone E., Ciofalo A., Vodicka J., Iacono V., Mylonakis I., Scarpa B., Russo M., Iengo M., de Vincentiis M., Martini A. and Ottaviano G., *Pleasantness of olfactory and trigeminal stimulants in different Italian regions.*, European Archives of Oto-Rhino-Laryngology, 1–7, 2017.

DOI:10.1007/s00405-017-4722-5

Peer reviewed proceedings
book chapters

Russo, M., *Malaria risk detection via mixed membership models*, CLADAG 2021 book of abstract and short papers.

DOI: 10.36253/978-88-5518-340-6

Russo, M., *Detecting Group Differences in Multivariate Categorical Data*, Proceedings the Italian Statistical Society, Firenze University Press, 2017.

ISBN 9788891927361

Russo M. and Scarpa B., *Learning in medicine: the importance of statistical thinking*, Springer Nature, Method in Molecular Biology, (accepted for publication).

- Cabassi, A., Casa, A., Fontana, M., Russo, M., and Farcomeni, A.,** *Three testing perspectives on connectome data*, Springer Proceedings in Mathematics & Statistics, vol 257, 37–55. Springer, Cham, 2018.
DOI:10.1007/978-3-030-00039-4_3
- Under review **Lauffenburger, J. C., K. Choudhry, N. K., Russo, M., Glynn, R. J., Ventz, S., Trippa, L.,** *Leveraging adaptive trials to evaluate interventions in health services research*, (submitted).
- Aliverti, E. and Russo M.,** *Dynamic modeling of the Italians' attitude towards Covid-19*, arXiv preprint, arXiv:2108.01194 , (submitted).
- Teaching **Parallel Computing for big data analysis**, March 2018, Specialist lectures during the class of *Statistical Methods for Big Data Analysis* of Prof. Bruno Scarpa, University of Padova, Dept. of Statistical Sciences, Padova, Italy.
- Introduction to real analysis (B.Sc.)**, Year 2014/2015, Academic Tutor, University of Padova, Dept. of Statistical Sciences, Padova, Italy.
- Advanced statistical inference (M.Sc.)**, Year 2014/2015, Academic Tutor, University of Padova, Dept. of Statistical Sciences, Padova, Italy.
- Mentoring **Item response theory for network data**, *Master thesis in statistical Science at the University of Padova of Claudia Stocchi*, 2021.
- Invited talks **Invited in the session “Using external data in adaptive clinical trial design”**, at *ISBA world meeting 2021*, (ISBA 2021), Online.
- Invited in the session “Bayesian non parametrics methods for classification”**, *Classification and Data Analysis Group*, (CLADAG 2021), Online.
- Invited in the session “Recent developments in Bayesian methodology”**, (CMStatistics 2020), Online.
- Inference in clinical trials when the patient population is subject to changes over time**, *Division of Pharmacoepidemiology and Pharmacoeconomics*, Brigham and Women's Hospital & Harvard Medical School.
- Invited in the topic contributed session: "Statistical innovation in regulatory science"**, *Joint Statistical Meeting of the American Statistical Society*, (JSM 2020), Online.
- Contributed talks **Bayesian optimal sequential futility decisions via auxiliary endpoints**, *International Biometric Conference*, (IBC 2020), Accepted for contributed oral Presentation (selected among 700 submissions).
canceled due to COVID-19
- Scalable inference for network factor model**, *Advanced Statistics for Physics Discovery*, Padova, Italy, September 24, 2018.
- Multivariate mixed membership modeling: Inferring domain-specific risk profiles**, *IBC2018*, Barcellona, Spain, July 10, 2018.
- Bayesian Inference on Group Differences in Multivariate Categorical Data**, *COBAL V*, Cimat, Guanajuato, Mexico, June 8, 2017.
- Organized sessions **Advances in Bayesian methods for medical data**, *Bayesian Young Statisticians Meeting: Online*, (BAYSM:O 2020).
- Posters **Inference in response-adaptive clinical trials when the enrolled population varies over time**, *2020 Global Conference on Regulatory Science*, Online.
- Inference in response-adaptive clinical trials when the enrolled population varies over time**, *ASA Biopharmaceutical Section Regulatory-Industry Statistics Workshop 2020*, Online.

Inference in response-adaptive clinical trials when the enrolled population varies over time, *DIA Regulatory Science Forum 2020*, Online.

Inference in clinical trials when the patient population is subject to changes over time, *HiTS Annual Symposium*, Boston, MA, USA, October 21, 2019.

Soft classification tree ensemble of Higgs pair production, *Advanced Statistics for Physics Discovery*, Padova, Italy, September 24, 2018.

Multivariate mixed membership modeling: Inferring domain-specific risk profiles, *ISBA2018*, Edinburgh, United Kingdom, June 29, 2018.

A multivariate mixed membership model for malaria risk detection, *Obayes2017*, Austin, Texas, December 11, 2017.

Detecting Group Differences in Multivariate Categorical Data, *SIS2017*, Florence, Italy, June 28, 2017.

Bayesian Inference on Group Differences in Multivariate Categorical Data, *ISBA2016*, Sardinia, Italy, June 16, 2016.

- Workshops & Summer Schools **NIMBLE short course**, UC Berkeley, June 2020, (online).
3-day workshop on NIMBLE: a system for building and sharing analysis methods for statistical models, especially for hierarchical models and computationally-intensive methods.
- Start-Up Research**, University of Siena, Italy, June 2017.
A 2-day meeting where groups of young scholars, advised by senior researchers, were asked to develop innovative methods and models to analyze a common dataset from the Neurosciences.
- Data Hackathons - **Duke Datathon**, Durham, NC, USA, February 2017.
- **Stats under the stars-3**, Firenze, Italy, June 2017.
- **Stats under the stars**, Padova, Italy, September 2015.
- Reviewer for: BMC Bioinformatics; Computational Statistics and Data Analysis (CSDA); Electronics, European Symposium on Artificial Neural Networks (ESANN) 2020; Journal of Computation and Graphical Statistics (JCGS); Journal of Computational Methods in Sciences and Engineering (JCMSE); Journal of Open Source Software (JOSS) Mathematics; RJournal; Social Indicator Research; Statistical Methods & Applications (SMA); Trials.
- Conference committee Member of the program committee of the Thirty-fifth Conference on Neural Information Processing Systems NeurIPS (2021)
- Memberships International Society for Bayesian Analysis (ISBA); j-ISBA

Outreach & Events

- Regulatory Science Student & Faculty Mixer (October 2020)
Online meeting with graduate and prospective students to discuss research opportunities.
- Regsci Forum: Fellows Showcase. What the Harvard-MIT Center for Regulatory Science actually does? Wonder no more! (January 2020)
Research presentation to describe the world of regulatory science to students.
- Big data Biosensori e Biobanche, December 2019
Presentation of my research at Università degli Studi del Sannio.

- Harvard-MIT Center for Regulatory Science Open House: Learn about RegSci and research opportunity. (September 2019)
Meeting with Harvard graduate students to discuss research opportunities.
- Volunteer for Venetonight – La notte dei ricercatori, Padova, Italy. (2015,2016 & 2017)
Developed an online app interfacing with twitter to track and display in real-time the sentiment of the event.
- Volunteer for StatistcAll, Treviso, Italy (2015)
Statistical games and activities to show the magic of statistics to kids and adults.
- Volunteer at orientation days for high schools students, Scegli con noi. Campus Agripolis di Legnaro, Padova, Italy. (2015 & 2016)

Work experience

Feb. 2019 – Aug. 2019 **Data Analyst**, *WorkFor, WFIT CRM Services*, Roma.
Data analysis and consulting.

Study visits

Nov. 2016 – June 2017 **Visiting Research Scholar**, *Duke University, Department of Statistical Science*, Durham, NC, USA, under the supervision of prof. [David B. Dunson](#).
Sept. 2017 – Mar. 2018

Languages

Italian: native; English: fluent; French: basic; Spanish: basic.

Computing skills

Developed software **MMM**: an R/C++ package with broad implementation of the multivariate mixed membership model algorithm. Available for download at <https://github.com/rMassimiliano/MMM-tutorial>.
TrendUtilities: an R/C++ package implementing multi-arms and platform Bayesian adaptive designs. Available for download at <https://github.com/rMassimiliano/TimeChangingPopulation>.

Programming languages R (advanced knowledge of Rcpp, tidyverse and shiny libraries); C/C++,Python, Julia, Matlab, JAVA.

Operative System Linux (Fedora/Ubuntu), Windows, OSX and relative softwares.

Software SPSS, PSPP, Office, SQL/MYSQL,BUGS,JAGS,STAN, and NIMBLE.

Other \LaTeX , git/github, vim & emacs, bash.

27 October 2021