

Massimo Cannas

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Current position

Assistant professor of Statistics at the Department of Business and Economic Science, University of Cagliari.

Visiting Periods

- **Oct 2015- Dec 2015** Universitat Pompeu Fabra, Barcelona (*invited by Prof. Bruno Arpino*)
- **Nov 2018- Jan 2019** Universitat Pompeu Fabra (*invited by Prof. Bruno Arpino*)
- **Jan 2015-Mar 2015** University of Rhode Island, Kingston (USA) (*invited by Prof. Gavino Puggioni*)

Other professional experiences

- Official at the Department of Health and Social Policies of the Sardinian Region (2010-2012)
- Junior Data analyst at Postel, Milan (2005-2006) and Dell Computer (2004)

Education

- Ph.D. in Statistics, Bocconi University, Milan (2011).
Dissertation: Causal Modeling of Birth Register Data.
Advisor: Francesco C. Billari.
- Degree(Laurea) in Economics, Bocconi University, Milan (2002).
Thesis: Cluster Analysis and Kohonen maps: methodological aspects and applications.

Research interests

Causal inference — Bayesian modeling — Distribution theory. I worked on the implementation of propensity score methods with structured datasets, on recursive partitioning for covariate balance and in non parametric Bayesian clustering. I am particularly interested in the developing and studying properties of matching algorithms for causal inference.

Articles in peer-reviewed journals (click to go to article page)

- Cannas M, Arpino B (2019): Matching with Clustered Data: the CMatching Package in R, *R Journal (forthcoming)*.
- Cannas M, Arpino B (2019): Machine Learning for Propensity Score Matching and Weighting, *Biometrical Journal*, 61(4).
- Cannas M, Berta P (2019): Template matching for hospital comparison: an application to birth event data in Italy, *Statistics & Applications*.
- Cannas M, Conversano C, Mola F and Sironi E (2018): Random effects clustering in multilevel modeling: choosing a proper partition, *Advances in Classification and Data Analysis* 11.
- Cannas M, Puggioni G (2017): On the support of matching algorithms, *Statistics & Probability Letters*, 131.
- Cannas M, Conversano C, Mola F and Sironi E (2017): Variation in caesarean delivery rates across hospitals. A Bayesian semi-parametric approach, *Journal of Applied Statistics*, 44(12).
- Arpino B, Cannas M (2016): Propensity score matching with clustered data. An application to the estimation of the impact of caesarean section on the Apgar score, *Statistics in Medicine*, 35(12).
- Pani C, Vanelslander T, Fancello C and Cannas M (2015). Prediction of late/early arrivals in container terminals - A qualitative approach. *European Journal of Transport and Infrastructure Research*, 15.
- Cannas M, Sironi, E (2014): Hospital Differences in rates of Caesarean Deliveries in Sardinian region: an Observational Study, *Biostatistics, Epidemiology and Public Health Vol 11, 4*.
- Cannas M, Sironi, E (2013): Variation in rates of obstetric interventions across hospitals in Sardinia: a multilevel analysis, *Electronic Journal of Applied Statistical Analysis: Decision Support Systems and Services Evaluation, Vol 4, 1..*

Submitted papers

- Puggioni G and Cannas M (2019): On the Voigt profile (*submitted*)
- Cannas M (2019): The Case for Order Optimal Matching: A gender gap study (*submitted*)

Software

I am maintainer of the following R packages implementing some special matching algorithms:

- `OSDR`: Finds an Optimal System of Distinct Representatives
- `CMatching`: Matching Algorithms for Causal Inference with Clustered Data

Posters and invited talks

- Matching ranked women and men executives: the case for ordered matching. *European Causal Inference Meeting, Bremen, March 2019*.

- Some considerations on the support of matching algorithms. *1st European Causal Inference Meeting, Florence, April 2018*. (see the poster here)
- Propensity score matching with clustered data. *19th European Young Statisticians Meeting (EYSM), Charles University in Prague, Czech Republic, September 2015 (invited talk)*.
- A semi-parametric Bayesian model for clustering hospitals by similarity in patients' outcome: a study of cesarean sections rates in Sardinia. *7th International Conference of the ERCIM WG on Computational and Methodological Statistics, University of Pisa, September 2014 (invited talk)*.
- Machine learning techniques for the estimation of the propensity score: evaluating different balance measures. *1st Southern European Conference on Survey Methodology (SESM), Pompeu Fabra University, Barcelona, December 2013 (invited talk)*.

Conference Proceedings and Book Chapters

- Cannas M, Sironi E, Mola F: Estimating the effect of prenatal care on birth outcomes. In: *Classification, (Big) Data Analysis and Statistical Learning Springer Series Studies in Classification, Data Analysis and Knowledge Organization (2018)*.
- Cannas M, Berta P, Mola F: Template matching for hospital comparison: an application to birth event data in Italy. In: *Book of Short Papers CLADAG 2017*
- Conversano C, Cannas M and Mola F: A recursive partitioning algorithm for balancing covariates in causal inference studies. In: *Advances in Statistical Models for Data Analysis. Springer Series Studies in Classification, Data Analysis and Knowledge Organization (2015)*.
- Cannas M, Arpino B: Propensity score matching with clustered data: new strategies with an application to birth register data. In: *Proceedings of COMPSTAT 2014, Geneve, 19-22 August 2014, Editor: IASC*.
- Pani C, Cannas M, Fancello G and Vanelslander T: Vessel arrival uncertainty in container terminals: different approaches based on machine learning methods. In: *Proceedings of the BIVREC-GIBET transport research days 2013, Walferdange, Luxembourg-City 30-31 May 2013*.
- Cannas M, Arpino B and Billari F: Machine Learning algorithms for propensity score matching with clustered data: a simulation study. In: *Proceedings of the XLVI Scientific Meeting of the Italian Statistical Society. Sapienza University of Rome, June 20-22, (2012), Editor: CLEUP*.

Teaching

For undergraduate students (Bachelor degree in Economics and Management, University of Cagliari):

- STATISTICS (in Italian) (2012 - 2019)

For graduate students of the Ph.D. Program in Economics and Business Sciences (University of Cagliari):

- SAMPLING METHODS (2014)
- INTRODUCTION TO CAUSAL INFERENCE (2017)
- BAYESIAN INFERENCE: AN INTRODUCTION (2018, 2019)

■ Refereeing Activity

Journal of Applied Statistics — Statistical Methods and Applications — Sociological Methods and Research — Statistical Analysis and Data Mining

■ Memberships

Societa Italiana di Statistica (SIS)