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Julius Vainora

Contact Information

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Research Fields

Econometrics, Machine Learning, Network Econometrics

References

Miguel A. Delgado (Advisor)
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Juan Carlos Escanciano
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Universidad Carlos III de Madrid
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Education

2016–2020 **Ph.D. Economics** (*Cum laude*), Universidad Carlos III de Madrid, Spain
2018 Nov. **Visiting Ph.D. student**, Universitat Pompeu Fabra, Spain.
2014–2016 **Economic Analysis, M.Res. Economics**, Universidad Carlos III de Madrid, Spain.
2013–2015 **Econometrics, M.Sc. Statistics** (*Magna cum laude*), Vilnius University, Lithuania
2009–2013 **Econometrics, B.Sc. Statistics**, Vilnius University, Lithuania.

Teaching Experience

2017–2019 Fall Preliminary Statistics (Instructor)
Ph.D. program

2017–2019 Spring Econometrics II (Teaching Assistant)
Ph.D. program, Profs. Miguel A. Delgado and Carlos Velasco

2017–2020 Spring Quantitative Macroeconomics (Course support)
Undergraduate program, Prof. Álvaro Escribano

2017 Spring Applied Time Series Econometrics with R (Online course review)
Undergraduate and Master programs, Prof. Miguel A. Arranz

2015–2016 Fall Game Theory (Teaching Assistant)
Master program, Prof. Francisco Marhuenda

2016 Spring Econometrics (Teaching Assistant)
Undergraduate program, Prof. Gabriel Smagghue

Conferences, Seminars, and Workshops

2019 Nov. ENTER seminar, European Center for Advanced Research in Economics and Statistics (ECARES), Université libre de Bruxelles, Belgium

2018 Sep.	Econometrics Workshop 2018 (jointly with Cambridge, LSE, and QMUL), UC3M, Spain
2018 Aug.	33rd Annual Congress of The European Economic Association and 71st European Meeting of The Econometric Society, Cologne, Germany
2018 July	2018 IMS Annual Meeting on Probability and Statistics and 12th International Vilnius Conference on Probability Theory and Mathematical Statistics, Vilnius, Lithuania
2017 Dec.	Seminar at the Faculty of Mathematics and Informatics, Vilnius University, Lithuania
5×	UC3M Workshop

Work Experience

2011 Oct.–2013 Feb., 2013 Apr.–2013 Dec.	**Freelance Data Analyst**, *Euromonitor International*, Vilnius, Lithuania.
2013 Feb.–2013 Apr.	**Economic Modeller (Internship)**, *Euromonitor International*, Vilnius, Lithuania.

Achievements and Participation

2015–2019	Spanish Government Scholarship for Doctoral Studies, UC3M, Spain
2019	Vice dean's letter for teaching excellence, UC3M, Spain
2018 Apr.	Econometric Game (team leader), 1st place, Amsterdam, Netherlands
2017 Apr.	Econometric Game (team leader), finalist, Amsterdam, Netherlands
2014–2015	Graduate Program Scholarship, UC3M, Spain
2015	Rector's letter for academic performance, Vilnius University, Lithuania
2010 Mar.	Participant in The 20th Annual Vojtěch Jarník International Mathematical Competition for University Students, Ostrava, Czech Republic

Programming Tools

- R (10 years) ◆ C, C++, Java, Python (6 months) ◆ AWS, Spark (familiar)
- CSS, HTML, JavaScript, Matlab, PHP, SQL (3 years)
- Git, Maple, Mathematica (occasionally for 8 years)

Citizenship

Lithuanian

Languages

Lithuanian	Native
English	Fluent
Spanish	Upper Intermediate
French, German	Beginner

Refereeing

Statistics & Probability Letters

Other Activities

Member of the Econometric Society since 2015

Member of the Institute of Mathematical Statistics since 2019

Author of and contributed to a number of R packages

Stack Overflow user

Job Market Paper

Network Dependence and Inference

This paper considers the problem of making valid inferences with network data. In general, data is dependent when the underlying entities form a network; however, the exact nature of the relationship between network topology and data dependence is not clear. Accounting for dependence between network entity attributes is instrumental for valid inferences, but this has received little formal treatment and tends to be neglected in practice. The main contribution of this paper is to provide a formal framework for handling the dependence of network data, giving rise to new ways of making inferences. The proposed estimators can be easily implemented in practice and require a single network observation. Laws of large numbers, consistency of autocovariance function estimators, and a central limit theorem are proven. A number of theoretical and empirical applications of the provided framework are presented.

Working Papers

A Pearson Statistic for Conditional Distribution Model Checking
(with Miguel A. Delgado)

We propose an asymptotically pivotal Pearson statistic for specification testing of parametric conditional distributions. Data is grouped into a contingency table according to partitions exploiting the fact that the conditional integral transform of the dependent variable is independent of the explanatory variables. We can reproduce classical results for marginal distributions related to Pearson test using this type of partition, for example, a Chernoff-Lehmann result and the asymptotic equivalence to the likelihood ratio test and some computationally relevant alternatives. In particular, the tests are still valid when sample-dependent partitions are used, and we provide an algorithm to construct partitions with asymptotically equiprobable classes. Also, a normal approximation is valid when the number of classes in the partition is large, which is relevant when data is sparse, with some empty cells. We study the power of the test under contiguous alternatives converging to the null at the rate of $n^{-1/2}$ or $n^{-1/4}$, when the number of cells is fixed or diverges with the sample size respectively. The finite sample performance of the test is examined by means of a Monte Carlo experiment, where we compare Pearson test with existing omnibus alternatives.

Work in Progress

Nonparametric Estimation of Low-Rank Graphons
(with László Györfi and Gábor Lugosi)

Network Dependence Counterfactuals and Their Estimation Using Machine Learning

This paper introduces a new concept of network dependence counterfactuals. While counterfactual measures of outcome variables are well-understood, counterfactual dependence between outcome variables has not been considered. In this paper we exploit the network stationarity assumption allowing to estimate, given a single network observation, the counterfactual covariance between outcome variables of any two network entities under a given hypothetical network structure. We further propose a more flexible estimation procedure using machine learning algorithms. As an application, we suggest a series of vertex and edge influence and network robustness measures and illustrate them on microfinance data from Indian villages.