

# Federico Nutarelli

## PERSONAL DETAILS

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## ACADEMIC APPOINTMENTS

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**Research Assistant, IMT School for Advanced Studies** Currently  
*Under the supervision of Prof. Dr. M. Riccaboni*

## EDUCATION

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**PhD in Economics, Networks and Business Analytics** Currently  
*IMT School for Advanced Studies*

**Master of Science in Economics** 2017  
*Sant'Anna School for Advanced Studies*  
110/110 Summa cum Laude

**Bachelor Degree in Economics and Business** 2015  
*University of Pisa*  
110/110 Summa cum Laude

## ADDITIONAL EDUCATION

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**Summer School** 2019  
*SIDE (Italian Econometrics Association), Bertinoro*  
"Machine Learning Algorithms for Econometricians"

**Summer School** 2018  
*TU Wien*  
"Machine Learning Methods and Data Analytics in Risk and Insurance" (VISS2018).

## EMPLOYMENT

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**Data Analysis** 2020-Currently  
*Roche*  
Supervision : Under Prof. Dr. Riccaboni M. and Giuliani G.  
About : Analysis of innovation in the biotechnological context and in the enhancement of advanced therapies.

**Data Science** 2019  
*LVMH, Milan*

Supervision : Under Dr. Romboli F.

About : Efficient storage of the company data and click through rate analysis.

**Networks** 2016

*ISTAT (Italian National Institute of Statistics)*

Supervision : Under Dr. Reale A. and Prof. Dr. Drago C.

About : Analysis of complex systems and Network theory.

## **AWARDS AND SCHOLARSHIPS**

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**Scholarship Roche Holding AG** 2020-2021

*Role: research assistant*

**Indam GNAMPA 2020 Project Funding** 2020

*Role: co-investigator*

**Full Doctoral Scholarship, IMT School for Advanced Studies** 2017

*Awarded with the highest score out of 3100 candidates (ex aequo)*

**ISTAT** 2016

*Selected among the top 15 students*

**University of Pisa -Sant'Anna School for Advanced Studies** 2015

*Selected as a student in MsC Economics*

**BCC Scholarship** 2012

*Scholarship for deserving students in high-school*

## **RESEARCH INTERESTS**

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Data Science for Pharmaceutical Industry, Data Science for Economics, Machine Learning, Causal Inference, Industrial Economics, Optimization, Mathematical Economics

## **PUBLICATIONS (PEER REVIEWED)**

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\* Indicates the publications where I contributed as first author or the co-first author.

### **Journal Publications**

2021 \* *Optimal data collection design in machine learning: the case of the fixed effects generalized least squares panel data model.* (with G. Gnecco and Selvi D.), **Machine Learning**, 2021, DOI: 10.1007/s10994-021-05976-x

2020 \* *Optimal trade-off between sample size, precision of supervision, and selection probabilities for the unbalanced fixed effects panel data model.* (with G. Gnecco and Selvi D.), **Soft Computing**, 2020, 24, 15937–15949

2019 \* *On the trade-off between number of examples and precision of supervision in machine learning problems* (with G. Gnecco), **Optimization Letters**, DOI: 10.1007/s11590-019-01486-x

## Conference Proceedings

2020 \* "*Optimal trade-off between sample size and precision of supervision for the fixed effects panel data model*" (with Gnecco G.) **Proceedings of the 5<sup>th</sup> Int. Conf. on machine Learning, Optimization & Data science (LOD 2019)**, Lecture Notes in Computer Science

2019 \* "*On the trade-off between number of examples and precision of supervision in regression problems*" (with Gnecco G.) **Proceedings of the 4<sup>th</sup> Int. Conf. of the International Neural Network Society on Big Data and Deep Learning (INNS BDDL 2019)**, , vol. 1, pp. 1-6, Springer International Publishing, 2019. ISBN: 978-3-030- 16840-7.

2019 \* "*Network Analysis of the Mediterranean Food Footprint flows*" (with Facchini A., Galli A., Caldarelli G.) **CCS2019: Conference on Complex Systems 2019**, number 286

## Book Chapters

2020 \* "*Lecture Notes in Computer Science*", LOD (2019)

## **WORKING/SUBMITTED PAPERS**

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1. \* "*Matrix Completion of World Trade*" (with Gnecco G. and Riccaboni M.) - under review
2. \* "*Testing the quality of the delineatio of Local Labour Market Areas*" (with Reale A. and Drago C.)
3. \* "*Commuting Flows in Tuscany: a general analysis*" (with Reale A). - internal publication at ISTAT
4. \* "*Product recalls, market size and innovation in the pharmaceutical industry*" (with Morescalchi A. and Riccaboni M.)
5. \* "*Assessing the Impact of COVID-19 on Trade: a Machine Learning Counterfactual Analysis*" (with Dueñas M., Riccaboni M., Ortiz V., Serti F.)
6. \* "*On automatic dispersion curve identification*" (with Gnecco G. and Bacigalupo A.)
7. \* "*Optimal pricing strategy of advanced therapies*" (with Riccaboni M., Giuliani G., Ferrario M.)
8. \* "*A unified principal agent theory on price-volume agreement*" (with Gnecco G. and Biancalani F.)

## **ONGOING RESEARCH PROJECTS**

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9. \* "*Overcoming the shortcomings of DiD through Machine Learning*" (with Gnecco G. and Incerti F.)

## Single-authored projects

10. \* "*Ramsey pricing and price of molecules: estimating own and cross elasticities of active principles*"

## TEACHING EXPERIENCE

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Lecturer at IMT School for Advanced Studies

2020-2021

Graduate course: *Applied Data Science*

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### Conferences and Invited Seminars

2022 **ASSA 2022**, American Economic Association.

2021 **YETI 2021**, YETI, Young Economists of Tuscan Institutions Conference, Pisa

2021 **AMASES 2021**, “Networks, Big Data, and Artificial Intelligence in Economics, Finance, and Social Sciences” Parallel Session.

2021 **ODS 2021** “International Conference on Optimization and Decision Science (ODS2021)” Parallel Session

2020 **ISOR Kolloquium**, Department of Statistics and Operations Research of the University of Wien, Organizer: Immanuel Bomze.

2019-2020 **IMT Reading group**, Presented several machine learning papers as a speaker at the “Reading Group in Machine Learning and Networks”.

2019 **LOD 2019**, speaker at The Fifth International Conference on Machine Learning, Optimization, and Data Science (LOD2019)

2019 **ODS 2019**, in Program of the International Conference on Optimization and Decision Science (ODS 2019), p. 16, Genoa, Italy, September 4 th -7 th, 2019.

2019 **AMASES 2019**, in Program of the 43rd Annual Meeting of the Italian Association for Mathematics Applied to Social and Economic Sciences (AMASES 2019), p. 4, Perugia, Italy, September 9 th -11 th, 2019.

## PROFESSIONAL SERVICE

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Reviewer for: Dynamic Games and Applications (DGAA)

## AFFILIATIONS

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Association for Mathematics Applied to Social and Economic Sciences, AMASES, , The National Institute for Advanced Mathematics of Italy (INdAM), GNAMPA group (National Group for Mathematical Analysis, Probability and their Applications).

## LANGUAGES

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<i>Italian</i>	Mother tongue
<i>English</i>	Full Professional Proficiency
<i>German</i>	Advanced

## COMPUTER SKILLS

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Programming Languages	PYTHON
Statistical Software:	R, STATA, MATLAB

Mark up languages       $\LaTeX$ , Beamer

Other Software      GIT/GITHUB

## **EXTRA CURRICULAR ACTIVITIES**

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1. Member of Chess Club
2. Boxe
3. Guitar