

Domenico Mergoni

Curriculum

Education

- 2020 - now **PhD in Discrete Mathematics**, London School of Economics, UK.
Expected end: Summer 2025
- 2018 - 2020 **MSc in Pure Mathematics**, ETH Zürich, Switzerland.
GPA: 5.77/6 'cum laude'
- 2015 - 2018 **BSc in Pure Mathematics**, University of Pisa, Italy.
GPA: 110/110

Working Experiences

- **Applied Scientist (at Amazon)**,
6 months internship, Jun-Dec 2024:
Implementation of ILS algorithm for the optimisation of schedule of trucks. Goals:
 - Improvement of 1 – 2% in the objective function,
 - Documentation, benchmarking, publication.
- **Teaching (at London School of Economics)**:
 - **Statistics and Machine Learning (2022-23)**:
MA310: Machine Learning; MA455: Reinforcement Learning (MSc course).
 - **Finance (2023)**:
FM250: Finance; ME200: Comp. Methods in Financial Mathematics.
 - **Management (2022-23) - Lecturer**:
Pre-sessional course for LSE Global Master's in Management.
 - **Mathematics (2020-22)**:
Discrete Mathematics, Fundamentals of Operations Research, etc.
- **Other**:
 - **Research Assistant**:
 - * 2023 **Supply chains** @LSE Management dept. Work on the *beer decision game*.
 - **Managerial positions**:
 - * 2021-now **Senior Subwarden**@ LSE. *Lead of a 10-people team to oversee students' wellbeing.*
 - 2023 **Main organiser** for PCC2024. *Lead of a 4-people team.*
 - **Internships**:
 - 2020 **PigeonLine**. *Applications of graph theory to statistical analysis of correlations.*
 - 2019 **Operations Team**, ETH Entrepreneur Club.

Coding

- * Python Advanced, (*Codeforces; GTA of MSc RL course*)
- Kotlin Advanced, *Industry experience*
- R Intermediate, (*GTA of Machine Learning with R*)

Awards and Grants

- * 2022 **LMS Computer Science Small Grant**, London Mathem. Society.
- 2021 **LSE Contribution Award**, Dept. of Maths, LSE.

Papers (selected)

Areas: Pure Mathematics, Multiagent Reinforcement Learning, Game Theory, Optimization, Methodology.

Work in progress

- * 2024+ **Methodology for carbon credit assessment**, with G A. Perrella, G. Marastoni.
- * 2024+ **ILF for ℓ_0 -bounded local improvement**, with Amazon ATS team.
- * 2024+ **Convergence of Policy Gradient Methods to Nash Equilibria in Repeated Games**, with G. Ashkenazi-Golan, E. Plumb.
- 2024+ **Partition universality for hypergraphs of bounded degeneracy and degree**, with P. Allen, J. Böttcher.

On Arxiv

- 2024 **Dirac's theorem for graphs of bounded bandwidth**, with A.E. Díaz, P. Gupta, O. Parczyk, A. Sgueglia., <https://arxiv.org/abs/2311.18796>.
- 2023 **Product free sets in $[n]$** , with L. Mattos, O. Parczyk., <https://arxiv.org/abs/2311.18796>.

Accepted

- * 2023 **The Ramsey numbers of squares of paths and cycles**, with P. Allen, B. Roberts, J. Skokan, The Electronic Journal of Combinatorics.

Relevant Talks and Conferences

Organiser

- * 2024 **PCC**, Main Organiser, University of London (LSE, UCL, KCL),
- 2022/23 **PhD CGO Seminar**, *PhD Organiser*, LSE.

Summer Schools

- * 2023 **EEML**, *Invited participant*, Summer School organised icw DeepMind.
- 2023 **Charles University Spring School**, *Invited Participant*.

Speaker (selected)

- 09/2023 **Invited Speaker**, *Ramsey number of P_n^2* , @DMV Ilmenau
- 08/2023 **Contributed Talk**, *Hypergraph partition universality*, @EuroComb Prague
- 07/2022 **Contributed talk**, *Chromatic profile of $\{C_3, \dots, C_{2k-1}\}$* , @RSA Poznan
- 07/2022 **Contributed talk**, *Ramsey number of P_n^2* , @ICGT Montpellier
- 06/2022 **Invited seminar**, *Ramsey number of P_n^2* , @TU Hamburg
- 05/2019 **Mittagsseminar**, *Minimal Ramsey Graphs for Ciclicity*, ETHZ (Supervised by C. Knierim).

Languages (ordered by proficiency)

- Italian Native
- English C2 level, IELTS test score: 8.0 on July 2018
- Spanish B2 level
- Portuguese In progress