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Webpage: https://conj34.github.io

Updated: November '24

# Domenico Mergoni

*Curriculum*

## Education

2020 - now **PhD in Discrete Mathemathics**, London School of Economics, UK.
*Expected: 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. Focus on the ILS Metaheuristics.
- 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 at Amazon*
R Intermediate, *(GTA of Machine Learning with R)*

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## 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, Reinforcement Learning, Game Theory, Optimisation, Methodology.

### Work in progress

* 2024++ **Reinforcement Learning for Combinatorial Games.**
* 2024++ **Methodology for carbon credit assessment**, with A. Perrella, G. Marastoni.
* 2024+ `Re-ILS`**: a metaheuristic approach for cardinality-constrained optimization**, with Amazon ATS team.
* 2024+ **Combinatorial theorems in extremely sparse random sets**, with P. Allen, J. Boettcher, J. Lada.

### Submitted

* 2024 **Reinforcement Learning, Collusion, and the Folk Theorem**, with G. Ashkenazi-Golan, E. Plumb, https://arxiv.org/abs/2411.12725.
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 | C1 level |
| Portuguese | A1/A2; work in progress |