

## Personal Information

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Federico Mara

## Education

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2020 - ongoing	<b>PhD Candidate in Urban Science and Regional Planning</b> - Department of Energy, Systems, Territory and Construction Engineering (DESTeC) – University of Pisa, Pisa, Italy
2021	<b>Master's Degree habilitation in Building Engineering</b> – First session, 2021 – University of Pisa, Pisa, Italy
2013 - 2020	<b>Master's Degree in Building Engineering and Architecture</b> – July 9, 2020, Department of Energy, Systems, Territory and Construction Engineering (DESTeC) – University of Pisa, Pisa, Italy  Thesis: <i>“The Park of Research and Territory in the Green Heart of Italy: a green economy project for the refunctionalisation of the former Enel thermoelectric power plant area in Gualdo Cattaneo (PG, Italy)”</i>  Supervisor: Prof. Valerio Cutini, Prof. Giovanni Santi, Prof. Marco Antonelli
2008 - 2013	<b>High School Scientific Diploma</b> – July 6, 2020, Liceo Scientifico U. Dini, Pisa, Italy

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## Experience - Research Activities

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01.11.2020 – 31.03.2024	<b>Doctoral Researcher</b> at the <b>University of Pisa</b> (Italy) - Department of Energy, Systems, Territory and Construction Engineering (DESTeC)  Supervisor: Prof. Valerio Cutini  Assignment: development of a three-year research project under supervision in the field of urban and regional planning, with the aim to provide an original contribution and support the development of new spatial models (top-down and bottom-up modelling) oriented to aid decision-making and risk analysis.  Thesis title: Urban Design and Crime Prevention: towards an Environmental Approach to Security  Performed activities: 1) design, organization and management of an innovative research project, after the definition of the research field, specific topic, research questions, methodology, expected results and the development of a comprehensive literature review on the environmental approach to security; 2) research gap definition: does/how intrinsic configurational characteristics affect urban dynamics, people behaviour (flow- and visibility-related) and crime distribution logic?; 4) assessment of potential correlations between real crime distribution and configurational properties through the use of several different techniques (top-down and bottom-up modelling approaches, in particular Space Syntax and Agent-based Modelling); 5) definition of the spatial crime impedance measure, namely the natural resistance that the urban environment, considering just its spatial configuration and physical layout, opposes to criminal activities; 5) synthesis of results; 6) revision of articles; 7) organization of workshops and lectures.  Results: dissemination in international conferences; publication of six Springer book chapters and conference proceedings papers, including the International Conference in Computational Science and its Applications (2022, 2023) and the 13 <sup>th</sup> Space Syntax Symposium (2022).
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## Experience – Academic and Teaching Activities

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01.04.2022 – 31.07.2023 Master’s degree course on “Territorial Modelling” Department of Energy, Systems, Territory and Construction Engineering (DESTeC); **University of Pisa** (Italy).

Organizer: Prof. Valerio Cutini

Performed Activities: Lecturer of a module in Configurational modelling and its integration with Geographical Information Systems; teaching of methods for urban design and spatial analysis, support and supervision of students’ final projects.

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01.11.2022 – 28.02.2023 Bachelor’s degree course on “Urban Design Techniques” Department of Energy, Systems, Territory and Construction Engineering (DESTeC); **University of Pisa** (Italy).

Organizer: Prof. Valerio Cutini

Performed Activities: Lecturer of a module in Geographical Information Systems–modelling and methods for urban design and spatial analysis, support and supervision of students’ final projects.

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### International Conferences

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06 – 08.09.2023 The 12th International Conference on Innovation in Urban and Regional Planning INPUT 2023, University of L’Aquila (Italy) – (Peer-Reviewed Conference)

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01 – 04.07.2023 The 23rd International Conference on Computational Science and Its Applications ICCSA 2022, University of Malaga (Spain) – (Peer-Reviewed Conference)

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04 - 07.07.2022 The 22nd International Conference on Computational Science and Its Applications ICCSA 2022, University of Malaga (Spain) – (Peer-Reviewed Conference)

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20 - 24.06.2022 The 13th Space Syntax Symposium, Western Norway University of Applied Sciences (HVL) (Norway) – (Peer-Reviewed Conference)

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### Prizes and Awards

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07.07.2022 Best Paper Award for the paper titled “Digital city-surveillance models and urban security: integrating Isovist and Space Syntax in realising adaptive Decision Support Systems” presented at 22th International Conference on Computational Science and Applications (ICCSA 2022) and its associated workshops, University of Malaga, Spain.

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08.09.2023 Best Paper Award for the paper titled “ Space Syntax vs Agent-Based Modelling in the Maze of Urban Complexity: A Critical Comparison Between Top-Down and Bottom-Up Approaches and Applications” presented at 12<sup>th</sup> International Conference on Innovation in Urban and Regional Planning INPUT 2023, University of L’Aquila, Italy.

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### Skills

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#### Languages

	Speaking	Listening	Reading	Writing
Italian			Native	
English	C1	C1	C2	C1
Portuguese	A1	A1	A1	-
French	-	A1	A1	-

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#### Software

- MS Office (Word, PowerPoint, Excel, Power Bi, Forms, Teams, Outlook)
- Geographical Information Systems (QGIS)
- Configurational Analysis Software: DepthMapX 0.5; 0.8
- Network Analysis Software: Gephi

## Publications

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### Peer-Reviewed Scientific Journals (under review)

01. MARA, F., CUTINI, V. (under review) The environmental approach to security: a historical-theoretical literature review on space and crime. *Planning Theory and Practice*.
02. MARA, F., ALTAFINI, D., CUTINI, V. (under review) Digital Twins to Forecast Crime Patterns: Comparing Space Syntax and Agent-Based Models in Exploring Pedestrian Movement and Visibility. *Environment and Planning B*.
03. MARA, F., MONTALDI, C., ZULLO, F., CUTINI, V. (under review). Urban disasters as catalyst of ongoing processes: the role of configuration analysis in unveiling potential development trends in L'Aquila's post-earthquake scenario. *Applied Geography*.

### Peer-reviewed Conferences (under review)

01. MARA, F., ANSEMI, C., DERI, F. (under review) The Spatial Roots of Urban Growth: Modelling Urban Dynamics with Space Syntax. *International Conference on Computational Science and Its Applications*.

### Chapters in Collective Volumes – Peer-reviewed Conferences

01. HACAR, M., MARA, F., ALTAFINI, D., CUTINI, V. (2023). Preprocessing Open Data for Optimizing Estimation Times in Urban Network Analysis: Extracting, Filtering, Geoprocessing, and Simplifying the Road-Center Lines. In *International Conference on Innovation in Urban and Regional Planning* (pp. 551-562). Cham: Springer Nature Switzerland.
02. MARA, F., CUTINI, V. (2023). Space Syntax vs Agent-Based Modelling in the Maze of Urban Complexity: A Critical Comparison Between Top-Down and Bottom-Up Approaches and Applications. In *International Conference on Innovation in Urban and Regional Planning* (pp. 585-596). Cham: Springer Nature Switzerland.
03. PEZZICA, C., ALTAFINI, D., MARA, F., CHIONI, C. (2023). Travel-Time in a Grid: Modelling Movement Dynamics in the “Minute City”. In *International Conference on Innovation in Urban and Regional Planning* (pp. 657-668). Cham: Springer Nature Switzerland.
04. ALTAFINI, D., MARA, F., CUTINI, V. (2023). A Data-Driven Approach for a City-University Mobility Plan: The Case of the University of Pisa. In *International Conference on Computational Science and Its Applications* (pp. 401-417). Cham: Springer Nature Switzerland.
05. MARA, F., CUTINI, V. (2023). Modelling crime dynamics and risky places: a basic combination of crime theories and space syntax to evaluate spatial crime impedance. In *International Conference on Computational Science and Its Applications* (pp. 227-243). Cham: Springer Nature Switzerland.
06. MARA, F., CUTINI, V. (2022) Digital City-Surveillance Models and Urban Security: Integrating Isovist and Space Syntax in Realising Adaptive Decision Support Systems. In: (a cura di): Osvaldo Gervasi Beniamino Murgante Sanjay Misra Ana Maria A. C. Rocha Chiara Garau, *Lecture Notes in Computer Science*. vol. 13377, p. 353-369, Cham:Springer Nature, ISBN: 978-3-031-10535-7, doi: 10.1007/978-3-031-10536-4\_24.
07. MARA, F., CUTINI, V., ALTAFINI D. (2022), Urban Design, Space Syntax and Crime: an evidence-based approach to evaluate urban crime geographical displacement and surveillance efficiency. In: *Proceedings of the 13th Space Syntax Symposium, 20th to 24th June 2022, Western Norway University of Applied Sciences (HVL), Bergen, Norway*.

Date: 11.03.2024

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