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# DANIELE FRIGIONI

## CURRICULUM VITÆ ET STUDIORUM

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# 1 Biographical notes

Born in Avezzano (Italy) on January 31, 1968. Italian Citizen.

## 1.1 Education

1993 – 1997 Ph.D. in Operation Research, University of Rome “La Sapienza”, Italy. Thesis title *Dynamic algorithms for connectivity and path problems on graphs*. Supervisor Prof. Alberto Marchetti-Spaccamela.

1987 – 1992 *Laurea Summa cum Laude* in Computer Science, University of L’Aquila, Italy. Thesis advisor Prof. Alberto Marchetti-Spaccamela.

## 1.2 Awards and honors

2017 **Full professor qualification** of the Italian Ministry of University and Research (settore concorsuale 09/H1, settore scientifico disciplinare ING-INF/05, Sistemi di Elaborazione delle Informazioni), April 4, 2017.

2002 EU Improving Human Potential Programme Young Researcher Fellowship (3 months). Department of Computer Engineering and Informatics, University of Patras, Greece.

2000 Italian National Research Council research fellowship, program n. 201.15.13 (12 months). University of Rome “La Sapienza”, Italy.

1999 Italian National Research Council research fellowship, program n. 201.15.11 (12 months). University of Rome “La Sapienza”, Italy.

1998 Italian National Research Council research fellowship, program n. 201.15.09 (6 months). University of Rome “La Sapienza”, Italy.

1997 NATO-CNR advanced research fellowships, program n. 215.29 (12 months). Max Planck Institut für Informatik, Saarbrücken, Germany.

1997 Italian National Research Council advanced research fellowships, program n. 203.15.07 (6 months). Max Planck Institut für Informatik, Saarbrücken, Germany.

## 1.3 Positions

2020 – **Full Professor** of Information Engineering, University of L’Aquila, Italy.

2005 – 2019 **Associate Professor** of Information Engineering, University of L’Aquila, Italy.

2002 – 2005 **Assistant Professor** of Information Engineering, University of L’Aquila, Italy.

2001 – 2002 **Research Fellow**, University of Rome “La Sapienza”, Italy, supported by the EU projects *WINE* and *BRAHMS*.

2000 – 2001 **Research Fellow**, University of L’Aquila, supported by EU project *MILORD* and by the MURST project *SPADA*.

- 1999 – 2001 **Post-doc**, University of Rome “La Sapienza”, Italy, supported by the Italian National Research Council research programs 201.15.09, 201.15.11, and 201.15.13.
- 1997 – 1998 **Post-doc**, Max Planck Institut für Informatik, Saarbrücken, Germany, supported by the Italian National Research Council advanced research program n. 203.15.07, and by the NATO-CNR advanced research program n. 215.29.

## 2 Teaching activity

### 2.1 University modules

- 2022 – 2024 *Algorithms and Data Structures* (60 hours), International Master Program in Computing Systems Engineering, University of L’Aquila (2 editions).
- 2022 – 2023 *Databases* (60 hours), Undergraduate Program in Information Engineering, University of L’Aquila (1 edition).
- 2012 – 2023 *Operating Systems* (60 hours), Undergraduate Program in Information Engineering, University of L’Aquila (11 editions).
- 2018 – 2022 *Algorithms Engineering* (60 hours), International Master Program in Computer and Systems Engineering, University of L’Aquila (4 editions).
- 2010 – 2018 *Algorithms Engineering* (90 hours), Master Program in Computer and Systems Engineering, University of L’Aquila (8 editions).
- 2008 – 2013 *Computer Architectures and Operating Systems* (90 hours), Undergraduate Program in Computer and Systems Engineering, University of L’Aquila (5 editions).
- 2008 – 2010 *Algorithms and Data Structures* (90 hours), Master Program in Computer and Systems Engineering, University of L’Aquila (2 editions).
- 2008 – 2010 *Foundations of Algorithms and Data Structures* (30 hours), Master Program in Computer and Systems Engineering, University of L’Aquila (2 editions).
- 2008 – 2010 *Foundations of Operating Systems* (30 hours), Undergraduate Program in Computer and Systems Engineering, University of L’Aquila (2 editions).
- 2008 – 2010 *Computer Architectures and Operating Systems* (60 hours), Master Course on Technologies, Applications and Services in Heterogeneous Radio Networks, University of L’Aquila (2 editions).
- 2005 – 2008 *Foundations of Computer Science* (60 hours), Undergraduate Program in Mechanical Engineering, University of L’Aquila (3 editions).
- 2002 – 2009 *Operating Systems* (60 hours), Undergraduate Program in Computer and Systems Engineering, University of L’Aquila (7 editions).
- 2002 – 2007 *Algorithms and Data Structures* (60 hours), Master Program in Computer and Systems Engineering, University of L’Aquila (5 editions).

- 2000 – 2004 *Computer Graphics* (60 hours), Undergraduate Program in Managerial Engineering, *Sabina Universitas* of Rieti (4 editions).
- 2000 – 2002 *Computer Science* (60 hours), Undergraduate Program in Sport Sciences, University of L'Aquila (2 editions).
- 1998 – 2001 *Computer Graphics* (90 hours), Undergraduate Program in Architectural Engineering, University of L'Aquila (3 editions).
- 1998 – 2000 *Computer Architectures* (60 hours), Undergraduate Program in Electronic Engineering, University of L'Aquila (2 editions).

## 2.2 Reviewing

- 2009 P. Ancillotti, M. Boari, A. Ciampolini, G. Lipari. *Sistemi Operativi* (2nd edition), McGraw-Hill, 2007.

## 2.3 Lecture notes

- 2012 M. D'Emidio, D. Frigioni, D. Romano. *Elementi di programmazione concorrente in ambienti GNU/Linux e MS Windows*. Libreria Universitaria Benedetti, 2012. ISBN 978-88-87-182-514.

## 2.4 Thesis supervision

- 2002 – 2019 I have supervised 58 bachelor and master degree thesis in Information Engineering and Computer and System Engineering at the University of L'Aquila.

# 3 Managing and service activity

- 2022 – **Vice Head** of the International Master Degree study programme in Computing Systems Engineering, University of L'Aquila.
- 2021 – 2022 **Vice Head** of the Bachelor Degree study programme in Information Engineering, University of L'Aquila.
- 2020 – Program committee: Ph.D. in *Information and Communication Technology*, University of L'Aquila.
- 2018 – 2021 **Head** of the Bachelor Degree study programme in Information Engineering for the three years period 2018–2020, University of L'Aquila.
- 2018 – 2021 Member of the *teaching board* of the Department of Information Engineering, Computer Science, and Mathematics of the University of L'Aquila, Italy.
- 2018 – 2021 **Chair** of the Gruppo Assicurazione Qualità of the Bachelor Degree study programme in Information Engineering, University L'Aquila.
- 2018 – 2021 **Chair** of the Commissione piani di studio e pratiche studenti of the Bachelor Degree study programme in Information Engineering, University of L'Aquila.

- 2018 **Chair of the organizing committee** for the Department of Information Engineering, Computer Science, and Mathematics of the University of L'Aquila, of the event *Il mio futuro da ingegnere @univaq*, L'Aquila 5–7 September 2018.
- 2017 – 2019 Program committee: Ph.D. in *Information Engineering*, Sapienza University of Rome.
- 2016 – 2017 Committee: Reference Group for topic 2.1 *Algorithms and architectures for computation and optimization*, of the PhD program in *Information and Communication Technology*, University L'Aquila.
- 2015 – 2019 **Co-founder** and member of the executive board of the *Alumni* association of the University of L'Aquila, Italy.
- 2014 – 2018 Committee: *Prospective students and tutoring*, University of L'Aquila.
- 2014 – 2018 **Placement delegate**, Department of Information Engineering, Computer Science and Mathematics, University of L'Aquila.
- 2014 – 2018 **Supervisor** for the University of L'Aquila of the web portal *Universitaly* of the Ministero dell'Istruzione, dell'Università e della Ricerca.
- 2013 – 2018 Committee: *Prospective students*, Department of Information Engineering, Computer Science and Mathematics, University of L'Aquila.
- 2013 – 2017 Committee: *Exams management* (ESSE3), University of L'Aquila.
- 2012 – 2018 **Supervisor** of the activities for prospective students of the Master degree study programme in Information Engineering, University of L'Aquila.
- 2012 – 2017 Program committee: Ph.D. in *Information and Communication Technology*, University of L'Aquila.
- 2009 – 2012 Committee: *Prospective students and tutoring*, Faculty of Engineering, University of L'Aquila.
- 2004 – 2011 Program committee: Ph.D. in *Electrical and Information Engineering*, University of L'Aquila.

## 4 Research activity

### 4.1 Research interests

I have co-authored 99 scientific publications in *peer-reviewed* international journal and conferences. The complete list of my publication is reported in Section 5.

My main research area is **algorithm engineering**, an emerging discipline in which the aim is bridging the increasing gap between classical algorithm theory and algorithmics in practice. In particular, advancements in computer hardware have rendered traditional computer models more and more unrealistic, and have led to a constantly increasing demand for practically efficient solutions to real world problems. Driven by concrete applications, Algorithm Engineering complements theory by the benefits of experimentation and puts equal emphasis on all aspects

arising during a cyclic solution process ranging from realistic modelling, design, analysis, robust and efficient implementations to careful experiments of algorithms and data structures.

My research activity in this field has been developed within the project PRIN *AMANDA* - Algorithmics for MASSive and Networked DATA financed by the Italian Ministry of Education, University and Research, and by the following projects financed by the European Union: *ARRIVAL* (Algorithms for Robust and online Railway optimization: Improving the Validity and reliability of Large scale systems), *ALCOM-FT* (Algorithms and Complexity in Future Technology), *BRHAMS* (BRoadband Access High data rate Multimedia Satellite), *WINE* (Wireless Internet Networks), *ALCOM-IT* (Algorithms and Complexity in Information Technology) e *ALCOM II* (Algorithms and Complexity).

The research has been focused on the design, analysis, and experimental evaluation of efficient algorithms for dynamic graph problem in different application scenarios: graph search algorithms for solving problems in *electric grids* [14, 24, 71]; computation of *minimal hyperpaths* in directed hypergraphs [31, 82, 93]; efficient dynamic solutions for the *constraint satisfaction problem* [38, 98]; computation of the *transitive closure* of a digraph [39, 41, 43, 91, 95, 96]. Specific attention has been given in this field of research to the development of efficient dynamic solutions for the *shortest path* problem on graphs [10, 17, 53, 56, 57, 58, 33, 40, 42, 45, 88, 90, 92, 94, 97, 99], motivated by its pervasive applications in many realistic scenarios, as for example: *routing on road networks* [20, 54, 63, 65]; *analysis of complex networks* [11, 49, 50]; *timetabling on public transportation networks* [13, 29, 55, 72, 76]; *routing on distributed networks* [4, 18, 19, 21, 22, 23, 25, 30, 32, 47, 60, 61, 62, 64, 67, 77, 83]; *automatic selection of optimal transformation models* in software engineering [7, 48].

Other research activities have been developed over the years in the following fields of computer science: 1) *robot-based computing systems*; 2) *robust optimization in transportation networks*; 3) *information retrieval*; 4) *spatial databases*.

1. **Robot-based computing systems.** In the last few years a considerably large amount of research in the area of distributed computing has been devoted to the study of models and algorithmic approaches for the so-called robot-based computing systems, due to their importance in a wide range of real-world applications. In this kind of systems, a set of mobile entities, usually referred to as robots, have to perform tasks or to achieve goals under a variety of assumptions that depend on the considered scenario. In the mentioned research field, a significant effort has been dedicated to models where robots are autonomous, i.e. they act without a central control, and operate in a Look-Compute-Move (LCM) operational model. In such a setting, robots operate in so-called LCM-cycles. During each cycle, a robot acquires a snapshot of the surrounding environment (Look phase), then executes an appropriate algorithm, which is the same for all robots, by using the obtained snapshot as input (Compute phase), and finally moves toward a destination, if any (Move phase).

My research activity in this field has been developed within the project *ARISE* (Arising Robust Internetnetworked System for Emergency contexts) financed by the Fondazione Cassa di Risparmio della Provincia dell'Aquila, and the project *RICOSTRUIRE* - Programma RIDITT (Trasferimento Tecnologico e creazione di nuove imprese nell'ambito delle tecnologie ICT avanzate applicate allo sviluppo economico e territoriale post sisma), financed by the Italian Ministry of Economic Development. The research activity in this area has been concentrated on the study of the following problems: *black-hole search* [16, 59], that is the problem of mobile entities that synchronously have to explore and repair a graph with

faulty nodes, usually called black-holes, that destroy any entering entity; *evaluate the computational power of mobile robots* that have to perform tasks without global coordination, and operate in the LCM model [12, 15, 51, 52].

2. **Robust optimization in transportation networks.** Optimization problems in transportation systems have been studied for many years in the perspective of the mathematical programming. This approach has been particularly useful to model the numerous restrictions that are typically present in this context. More recently these problem have attracted interest by the algorithmic research community, which has highlighted two very important and poorly considered aspects: robust planning and real-time planning. These two strictly related aspects, represent, respectively, a proactive and a reactive approach to deal with disruptions to the standard behaviour of the system.

The research activity in this area has been developed mainly within the EU projects *AR-RIVAL* (Algorithms for Robust and online Railway optimization: Improving the Validity and reliability of Large scale systems), and the RTN Project *AMORE* - Algorithmic Methods for Optimizing Railways in Europe. The primary goal of this research has been that of devising efficient algorithmic solutions for real problems dealing with massive data, as those arising in the context of railways, and in particular: *timetabling* [5, 13, 28, 55], *shunting* [5, 27, 73], and *delay management* [28, 69].

3. **Information retrieval.** In this research field, an area of great interest is that concerning Content Based Image Retrieval (CBIR) systems, whose main goal is that of retrieving images from massive databases of images based on their content (color, shape, text, etc.). Most of the known CBIR systems are dedicated to the retrieval of raster images, while very little is known for vector images.

My research activity in this area has been developed within the project *Sistemi Evoluti di Interazione con Spazi di Informazioni* financed by the Italian Ministry of Education and Research, and it has been centred on the design, development and experimental evaluation of VISTO (Vector Image Search TOol) [26, 68, 74, 75, 78, 79], a CBIR system for vector images in the SVG (Scalable Vector Graphics) format.

4. **Spatial Databases.** Spatial data concern objects that can be represented in two or three dimensional space, and they have received a growing interest over the years both from the academic and the industry communities. This interest derives from the great variety of applications in which they are involved. CAD/CAM, VLSI design, GISs, medical imaging are only a few examples of such applications

My research activity in this area has been developed within the project *SPADA* (Representation and Processing of Spatial Data in GIS) financed by the Italian Ministry of Education and Research. This research activity has been concentrated on the study of efficient techniques for the manipulation of *topological invariants* of *constraint databases* [35, 84], and on the design of a visual interaction environment for GISs, where the focus is on the visualization of the topological properties [34, 36, 37, 80, 81, 85, 86, 87, 89].

## 4.2 Editorial boards

2020 – *Algorithms* (MDPI).

2018 – 2019 **Guest editor** of the special issue of the journal *Algorithms* (MDPI) on *Algorithm Engineering: Towards Practically Efficient Solutions to Combinatorial Problems*.

### 4.3 Program committees

- 2023 **Program co-chair** *23rd Symposium on Algorithmic Approaches for Transportation Modelling, Optimization, and Systems* (ATMOS 2023), September 7–8, 2023, Amsterdam, The Netherlands.
- 2020 *18th IEEE International Conference on High Performance Computing & Simulation* (HPCS 2020), December 10–14 2020, Barcelona, Spain.
- 2020 *20th Symposium on Algorithmic Approaches for Transportation Modelling, Optimization, and Systems* (ATMOS 2020), September 7–8, 2020, Pisa, Italy.
- 2019 *17th IEEE International Conference on High Performance Computing & Simulation* (HPCS 2019), July 15–19, 2019, Dublin, Ireland.
- 2018 *17th International Symposium on Experimental Algorithms* (SEA 2018), June 27–29, 2018, L'Aquila, Italy.
- 2016 *24th European Symposium on Algorithms* (ESA 2016), August 22–24, 2016, Århus, Denmark.
- 2013 **Program co-chair** *13th Workshop on Algorithmic Approaches for Transportation Modelling, Optimization, and Systems* (ATMOS 2013), September 5, 2013, Sophie Antipolis, Francia.
- 2012 *12th Workshop on Algorithmic Approaches for Transportation Modelling, Optimization, and Systems* (ATMOS 2012), September 13, 2012, Ljubljana, Slovenia.
- 2001 *5th Workshop on Algorithm Engineering* (WAE 2001), August 28–31 2001, Århus, Denmark.

### 4.4 Research appointments

- 2016 – 2018 CINI (Consorzio Interuniversitario Nazionale per l'Informatica) **research unit director** of the University of L'Aquila.
- 2016 – 2018 **Scientific coordinator** of the *Interaction and Computation Systems* lab, Department of Information Engineering, Computer Science and Mathematics, University of L'Aquila.
- 2016 – 2017 **Technical and Scientific Board** member for the project (Rappresentante dell'Università dell'Aquila nel **Comitato Tecnico Scientifico** del progetto) *Cittadinanza e creatività digitale* svolto dall'Università dell'Aquila in collaborazione con il comune e le istituzioni scolastiche della città di Avezzano.
- 2013 – 2015 CINI (Consorzio Interuniversitario Nazionale per l'Informatica) **research unit director** of the University of L'Aquila.



2012 – 2013 **Technical and Scientific Board** member (Rappresentante dell'Università dell'Aquila nel **Comitato Tecnico Scientifico**) dell'incubatore d'impresa *HUB Avezzano* per il supporto alla fondazione di nuove imprese nel settore agro-alimentare nel territorio della Marsica.

2011 – 2013 **Scientific coordinator** of the *Algorithm Engineering* lab, Department of Electrical and Information Engineering, University of L'Aquila.

#### 4.5 Research projects

2022 – 2025 Italian Ministry of University and Research, Project PNRR *Vitality* - Ecosistema innovazione, digitalizzazione e sostenibilità per l'economia diffusa nel Centro Italia.

2018 – 2021 European Union, research project AfarCloud - Aggregate farming in the cloud, funded by ECSEL-JU call H2020-ECSEL-2017-2-RIA.

2014 – 2017 Italian Ministry of Education, University and Research, Project PRIN *AMANDA* - Algorithmics for MAssive and Networked DATa.

2015 – 2016 University of L'Aquila, **scientific coordinator** of the project *Engineering shortest path algorithms for complex networks*.

2013 – 2014 University of L'Aquila, **scientific coordinator** of the project *Engineering dynamic shortest path algorithms for transportation networks*.

2012 – 2016 Italian Ministry of Economic Development, Project *RICOSTRUIRE* - Trasferimento Tecnologico e creazione di nuove imprese nell'ambito delle tecnologie ICT avanzate applicate allo sviluppo economico e territoriale post sisma.

2012 – 2013 Foundation Cassa di Risparmio della Provincia dell'Aquila, Project *ARISE* - Arising Robust Internetworked System for Emergency contexts.

2011 – 2012 University of L'Aquila, **scientific coordinator** of the project *Engineering dynamic shortest path algorithms for real networks*.

2009 – 2012 Italian Ministry of Economic Development, Project *SIRRCE* - System for the residential energy optimization with summer air conditioning integration.

2008 – 2009 University of L'Aquila, **scientific coordinator** of the project *Robust algorithms for optimization problems*.

2006 – 2009 European Union, Project *ARRIVAL* (Algorithms for Robust and on-line Railway optimization: Improving the Validity and reliAbility of Large-scale systems), IST-FET OPEN Specific Targeted Research Project (**key researcher**).

2003 – 2006 University of L'Aquila, **scientific coordinator** of the project *Design, analysis and experimental evaluation of dynamic graph algorithms*.

2004 – 2007 University of L'Aquila, Project *Tecniche e Tecnologie per la Sorveglianza*.

2000 – 2003 European Union, Project RTN *AMORE* - Algorithmic Methods for Optimizing Railways in Europe.

- 2000 – 2003 European Union, Project EU *ALCOM-FT* - Algorithms and Complexity in Future Technology.
- 2001 – 2002 European Union, Project EU *BRHAMS* n. IST-1999-10440 - BRoadband Access High data rate Multimedia Satellite.
- 2001 – 2002 European Union, Project EU *WINE* n. IST-1999-10028 - Wireless Internet NEtworks.
- 2000 – 2002 Italian Ministry of Education, University and Research, Project *SPADA* - Representation and Processing of Spatial Data in GIS.
- 1999 – 2001 Italian Ministry of Education, University and Research, Project MURST 60% - Sistemi Evoluti di Interazione con Spazi di Informazioni.
- 1996 – 1999 European Union, Project EC ESPRIT Long Term Research Project *ALCOM-IT* - Algorithms and Complexity in Information Technology.
- 1994 – 1995 European Union, Project ESPRIT II Basic Research no. 7141 *ALCOM II* - Algorithms and Complexity.
- 1993 – 1998 Italian National Research Council, Progetto Finalizzato Trasporti 2.

#### 4.6 Research collaborators

- 2020 – 2022 Luigi Pomante, *Metodologie e strumenti SW per la progettazione concorrente di HW e SW per sistemi elettronici digitali dedicati*. Now Assistant Professor (RTD-B) at University of L'Aquila.

#### 4.7 Ph.D. students

- 2016 Mattia D'Emidio, doctoral program in Electrical and Information Engineering, University of L'Aquila. Now Assistant Professor (RTD-B) at University of L'Aquila.
- 2014 Vinicio Maurizio, doctoral program in Electrical and Information Engineering, University of L'Aquila. Now technician at the University of L'Aquila.
- 2012 Gianlorenzo D'Angelo, doctoral program in Electrical and Information Engineering, University of L'Aquila. Now Associate Professor at Gran Sasso Science Institute (GSSI), L'Aquila, Italy.

#### 4.8 Ph.D. theses committees

- 2022 *Non-Crossing Shortest Paths in Planar Graphs with Applications to Max Flow, and Path Graphs*, Lorenzo Balzotti, University of Rome "La Sapienza", Rome, Italy.
- 2017 *Information Spreading with Network Augmentation*, Yllka Velaj, Gran Sasso Science Institute (GSSI), L'Aquila, Italy.
- 2015 *MOSES: a QoS-driven Autonomic Framework for Service Oriented Systems*, Stefano Iannucci, University of Rome "Tor Vergata", Rome, Italy.

- 2015 *Reliability in Public Transport Networks*, Federico Santaroni, University of Rome “Tor Vergata”, Rome, Italy.
- 2008 *Cache Oblivious Computation of Shortest Paths: Theoretical and Practical Issues*, Luca Alulli, University of Rome “La Sapienza”, Rome, Italy.
- 2008 *Robot Teams for Multi-Objective Tasks*, Vittorio Amos Ziparo, University of Rome “La Sapienza”, Rome, Italy.
- 2008 *Modeling and Reasoning about Semantic e-services in Cooperative Information Systems*, Luigi Dragone, University of Rome “La Sapienza”, Rome, Italy.
- 2008 *Streaming Algorithms for Graph Problems*, Andrea Ribichini, University of Rome “La Sapienza”, Rome, Italy.

#### 4.9 Visiting

- 2007 Technical University of Karlsruhe (Germany), supported by EU project ARRIVAL. Guest: Prof. Dorothea Wagner (1 month).
- 2002 Computer Technology Institute (CTI) of Patras (Greece), supported by RTN project AMORE of the EU. Guest: Prof. Christos Zaroliagis (3 months).
- 1999 Computer Science Department, Kings’ College, London (UK). Guest: Prof. Christos Zaroliagis (2 months).
- 1997 – 1998 *Max Plank Institut für Informatik*, Saarbrücken (Germany). Guest: Prof. Kurt Mehlhorn (18 months).

#### 4.10 Rewieiving

- 2000 – 2018 Reviewer for the following international journals: ACM Journal of Experimental Algorithmics, Algorithmica, Algorithms, Journal of Parallel and Distributed Computing, Theoretical Computer Science, Journal of Discrete Algorithms, IEEE Transactions on Pattern Analysis and Machine Intelligence, IEEE Transactions on Computers, IEEE Transactions on Parallel and Distributed Systems, IEEE Transactions on Network and Service Management.
- 1995 – 2018 Reviewer for the following international conferences: ATMOS2023, COCOON2021, HPCS2020, ATMOS2020, HPCS2019, FUN2018, SEA2018, ATMOS2017, ESA2016, MFCS2015, MFCS2014, ATMOS2013, CIAC2013, ATMOS2012, SEA2012, ICALP2010, ESA2007, WG2006, SODA2006, ESA2004, STACS2001, WAE2001, SODA2000, AVI2000, MFCS2000, STOC1998, ICTCS1998, CAAP1997, WG1996, ICALP1996, WG1995, STACS1995.
- 2009 Reviewer for the volume: *Robust and online large-scale optimization. Lecture Notes in Computer Science* n. 5868, Springer-Verlag, 2009.

#### 4.11 Seminars

I have given seminars in the following national and international universities and research institutions: Università dell'Aquila, Università di Roma La Sapienza, Università di Genova, Università di Palermo, IASI-CNR di Roma, Max Planck Institut für Informatik, Saarbrücken (Germany), University of Aarhus (Denmark), University of Patras (Greece), Utrecht University (The Netherlands), Technical University of Karlsruhe (Germany), Kings' College, London (UK), Computer Technology Institute of Patras (Greece), Gran Sasso Science Institute, L'Aquila.

### 5 List of publications

#### Edited volumes

- [1] D. Frigioni, P. Schiewe. *Algorithmic Approaches for Transportation Modelling, Optimization, and Systems*. Proceedings 23rd International Symposium (ATMOS'23), September 7–8, 2023, Amsterdam, The Netherlands. *Open Access Series in Informatics (OASICS)*, vol. 115, Schloss Dagstuhl, 2023.
- [2] D. Frigioni, S. Stiller. *Algorithmic Approaches for Transportation Modelling, Optimization, and Systems*. Proc. 13th Int. Workshop (ATMOS'13), September 5, 2013, Sophia Antipolis, France. *Open Access Series in Informatics (OASICS)*, vol. 33, Schloss Dagstuhl, 2013.
- [3] G. S. Brodal, D. Frigioni, A. Marchetti-Spaccamela. *Algorithm Engineering*. Proceedings 5th International Workshop (WAE 2001), Århus, Denmark, August 28–31, 2001. *Lecture Notes in Computer Science*, vol. 2141, Springer, 2001.

#### Book chapters

- [4] G. D'Angelo, M. D'Emidio, D. Frigioni. Distance-Vector Algorithms for Distributed Shortest Paths Computation in Dynamic Networks. In Adamatzky, A. (Ed.) *Shortest path solvers. From software to wetware*. Series *Emergence, Complexity and Computation*, vol. 32, pp. 99–144, Springer, 2018.
- [5] S. Cicerone, G. D'Angelo, G. Di Stefano, D. Frigioni, A. Navarra, M. Schachtebeck, A. Schoebel. Recoverable robustness in shunting and timetabling. *Robust and online large-scale optimization, Lecture Notes in Computer Science* n. 5868, pp. 28–60, Springer, 2009.

#### International journals

- [6] S. Cicerone, M. D'Emidio, D. Frigioni, F. Tirabassi-Pascucci. Combining Polygon Schematization and Decomposition Approaches for Solving the Cavity Decomposition Problem. *ACM Transactions on Spatial Algorithms and Systems* vol. 7, n. 4 (2021), pp. 1–37, ACM.
- [7] F. Basciani, M. D'Emidio, D. Di Ruscio, D. Frigioni, L. Iovino, A. Pierantonio. Automated Selection of Optimal Model Transformation Chains via Shortest-Path Algorithms. *IEEE Transactions on Software Engineering*, vol. 46, n.3 (2020), pp. 251–279, IEEE.
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- [9] M. D’Emidio, D. Frigioni. Algorithm Engineering: Towards Practically Efficient Solutions to Combinatorial Problems. *Algorithms*, vol. 12, n. 11, Article n. 229, MDPI, 2019. DOI: 10.3390/a12110229
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## **Ph.D. Thesis**

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