

UNIVERSITÀ DEGLI STUDI DELL'AQUILA

Prof. Serafino Cicerone

Curriculum scientifico

(Aggiornato il 2024/07/11)

Resume:

November 05 - present:

baqq Associate Professor in Computer Science at the Department of Electrical & Information Engineering , University of L'Aquila (Italy).

February 01 - October 05:

Assistant Professor in Computer Science at the Department of Electrical & Information Engineering, University of L'Aquila (Italy).

November 99 - December 99:

Visiting scientist at Department of Computer Science, Institute of Theoretical Computer Science, University of Rostock (Germany). Supported by the German Research Community (DFG). DFG Research Project: "*Algorithms for Solving Optimization Problems in Discrete Metric Structures*". Host Professor: Andreas Brandstädt.

April 99 - January 01:

Post Doc at the Department of Electrical & Information Engineering, University of L'Aquila, Italy. Research Project: "*Graph Models and Algorithms for Relations among Spatial Objects Affected by Vagueness*". Host Professor: Paolino Di Felice.

June 98:

Ph.D. at the Dipartimento di Informatica e Sistemistica, Università di Roma "La Sapienza" and at the Department of Electrical & Information Engineering, University of L'Aquila (Italy). Thesis: "*Graph Algorithms for Problems in Medical Guideline Models and Special Graph Classes*". Advisor: Prof. Alessandro D'Atri.

March 93:

Laurea degree (summa cum laude) in Computer Science at the University of L'Aquila (Italy). Thesis: "*Rewriting of Algebraic Specifications and Applications to the Software Development*". Advisor: Prof. Francesco Parisi-Presicce.

Research topics:

- Algorithm
- Graph theory
- Distributed computing
- Models & algorithms for spatial data

Main research projects:

- [GEOSAFE](#) (Geospatial Based Environment For Optimisation Systems Addressing Fire Emergencies - EU Project Funded by Marie Skłodowska-Curie Research and Innovation Staff Exchange, RISE - Project reference: 691161). The GEO-SAFE project aims at creating a network enabling the two regions to exchange knowledge, ideas and experience, thus boosting the progress of wildfires knowledge and the related development of innovative methods for dealing efficiently with such fires. More precisely, the GEO-SAFE project focuses on developing the tools enabling to set up an integrated decision support system optimizing the resources during the response phase.

- [AMANDA](#) (Algorithms for MAssive and Networked DATA) - Natioanl project partially funded by Italian Ministry of Education, Research, and University (MIUR). The project will investigate algorithmics for massive data sets. On one hand the project will study emerging and realistic computational models and general algorithm design techniques; on the other hand it will focus on algorithmic issues specific for networked data sets.
- [ARRIVAL](#) (Algorithms for Robust and online Railway optimization: Improving the Validity and reliABility of Large scale systems) - European project funded by the Future and Emerging Technologies Unit of EC (IST priority - 6th FP), under contract no. FP6-021235-2. The main goal of ARRIVAL was to develop the necessary foundational algorithmic research in order to provide ingenious and sound answers to the fundamental efficiency and quality issues encapsulated in robust and online planning of complex, large-scale systems as those in railways.
- AMORE (Algorithmic Methods for Optimizing the Railways in Europe) - European project funded by the Human Potential Program of the EU, under contract n. HPRC-CT-1999-00104. The main goal of AMORE was to develop models for railway optimization problems, and to propose and implement algorithms for solving them.
- SPADA (Representation and Processing of Spatial Data in Geographic Information Systems) - Project funded by the Italian Ministry of University and Scientific and Technological Research (MURST).

Papers:

Book chapters

- Serafino Cicerone, Gabriele Di Stefano, Alfredo Navarra. Asynchronous Robots on Graphs: Gathering, In P. Flocchini, G. Prencipe, N. Santoro (Eds.). Distributed Computing by Mobile Entities. Volume 11340 of Lecture Notes in Computer Science - State-of-the-art Surveys, pages 184-217. Springer, 2019. https://doi.org/10.1007/978-3-030-11072-7_8
- Serafino Cicerone, Gabriele Di Stefano, Alfredo Navarra. Gathering a swarm of robots through shortest paths. In Adamatzky, A (Ed.) Shortest path solvers. From software to wetware. Volume 32 of of Emergence, Complexity and Computation, pages 27-72. Springer, 2018. <https://doi.org/10.1007/978-3-319-77510-4>
- Serafino Cicerone, Gianlorenzo D'Angelo, Gabriele Di Stefano, Daniele Frigioni, Alfredo Navarra, Michael Schachtebeck, and Anita Schöbel. Recoverable robustness in shunting and timetabling. In Ravindra K. Ahuja, Rolf H. Möhring, and Christos D. Zaroliagis, editors, Robust and Online Large-Scale Optimization: Models and Techniques for Transportation Systems, volume 5868 of Lecture Notes in Computer Science, pages 28-60. Springer, 2009.

Journals

- Serafino Cicerone, Gabriele Di Stefano. Approximation Algorithms for Decomposing Octilinear Polygons. Theoretical Computer Science, 779: 17-36. 2019. DOI: 10.1016/j.tcs.2019.01.037
- Serafino Cicerone, Gabriele Di Stefano, Alfredo Navarra. Embedded Pattern Formation by Asynchronous Robots without Chirality. Distributed Computing, 32(4): 291-315, 2019. DOI: 10.1007/s00446-018-0333-7
- Serafino Cicerone, Gabriele Di Stefano, Alfredo Navarra. Asynchronous Pattern Formation: the effects of a rigorous approach. Distributed Computing, 32(2): 91-132, 2019. DOI: 10.1007/s00446-018-0325-7
- Serafino Cicerone, Gabriele Di Stefano, Alfredo Navarra. Gathering of Robots on Meeting-Points: Feasibility and Optimal Resolution Algorithms. Distributed Computing, 31(1): 1-50, 2018. DOI: 10.1007/s00446-017-0293-3

- Serafino Cicerone, Gianlorenzo D'Angelo, Gabriele Di Stefano, Daniele Frigioni, Vinicio Maurizio. Engineering a new Algorithm for Distributed Shortest Paths on Dynamic Networks. *Algorithmica*, 66(1): 51-86, 2013. DOI: 10.1007/s00453-012-9623-9
- Serafino Cicerone, Gabriele Di Stefano, Michael Schachtebeck, and Anita Schöbel. Multi -Stage Recovery Robustness for Optimization Problems: a new Concept for Planning under Disturbances. *Information Sciences*, 190:107-126, 2012. DOI: 10.1016/j.ins.2011.12.010
- Serafino Cicerone. Characterizations of Graphs with Stretch Number less than 2. *Electronic Notes in Discrete Mathematics*, 37: 375-380, 2011.
- Serafino Cicerone, Gianlorenzo D'Angelo, Gabriele Di Stefano, and Daniele Frigioni. Partially dynamic efficient algorithms for distributed shortest paths. *Theoretical Computer Science*, 411(7-9):1013-1037, 2010.
- Serafino Cicerone, Gianlorenzo D'Angelo, Gabriele Di Stefano, Daniele Frigioni, and Alfredo Navarra. Recoverable robust timetabling for single delay: Complexity and polynomial algorithms for special cases. *Journal of Combinatorial Optimization*, 18(3):229-257, 2009.
- Serafino Cicerone, Gianlorenzo D'Angelo, Gabriele Di Stefano, Daniele Frigioni, and Alfredo Navarra. Recoverable robustness for train shunting problems. *Algorithmic Operations Research*, 4(2):102-116, 2009.
- Francesco Bruera, Serafino Cicerone, Gianlorenzo D'Angelo, Gabriele Di Stefano, and Daniele Frigioni. Dynamic multi-level overlay graphs for shortest paths. *Mathematics in Computer Science*, 1(4):709-736, 2008.
- Serafino Cicerone, Gianlorenzo D'Angelo, Gabriele Di Stefano, Daniele Frigioni, and Alberto Petricola. Partially dynamic algorithms for distributed shortest paths and their experimental evaluation. *Journal of Computers*, 2(9):16-26, 2007.
- Serafino Cicerone, Gabriele Di Stefano, and Dagmar Handke. Self-spanner graphs. *Discrete Applied Mathematics*, 150(1-3):99-120, 2005.
- Serafino Cicerone and Paolino Di Felice. Cardinal directions between spatial objects: the pairwise-consistency problem. *Information Science*, 164(1-4):165-188, 2004.
- Serafino Cicerone and Gabriele Di Stefano. Networks with small stretch number. *J. Discrete Algorithms*, 2(4):383-405, 2004.
- Serafino Cicerone and Eliseo Clementini. Efficient estimation of qualitative topological relations based on the weighted walkthroughs model. *GeoInformatica*, 7(3):211-227, 2003.
- Serafino Cicerone and Gabriele Di Stefano. (k, +)-distance-hereditary graphs. *J. Discrete Algorithms*, 1(3-4):281-302, 2003.
- Serafino Cicerone, Gabriele Di Stefano, Daniele Frigioni, and Umberto Nanni. A fully dynamic algorithm for distributed shortest paths. *Theor. Comput. Sci.*, 297(1-3):83-102, 2003.
- Serafino Cicerone, Daniele Frigioni, and Paolino Di Felice. A general strategy for decomposing topological invariants of spatial databases and an application. *Data Knowl. Eng.*, 42(1):57-87, 2002.
- Serafino Cicerone, Gabriele Di Stefano, and Michele Flammini. Static and dynamic low-congested interval routing schemes. *Theor. Comput. Sci.*, 276(1-2):315-354, 2002.
- Serafino Cicerone, Daniele Frigioni, and Laura Tarantino. Exploration of geographic databases: supporting a focus+context interaction style. *Journal of Applied System Studies*, 3(2), 2002.
- Serafino Cicerone and Gabriele Di Stefano. Graphs with bounded induced distance. *Discrete Applied Mathematics*, 108(1-2):3-21, 2001.

- Serafino Cicerone, Gabriele Di Stefano, and Michele Flammini. Compact-port routing models and applications to distance-hereditary graphs. *J. Parallel Distrib. Comput.*, 61(10):1472-1488, 2001.
- Serafino Cicerone, Gabriele Di Stefano, and Michele Flammini. Low-congested interval routing schemes for hypercubelike networks. *Networks*, 36(3):191-201, 2000.
- Serafino Cicerone and Gabriele Di Stefano. On the extension of bipartite to parity graphs. *Discrete Applied Mathematics*, 95(1-3):181-195, 1999.
- Serafino Cicerone and Gabriele Di Stefano. Graph classes between parity and distance-hereditary graphs. *Discrete Applied Mathematics*, 95(1-3):197-216, 1999.
- Serafino Cicerone, Daniele Frigioni, Umberto Nanni, and Francesco Pugliese. A uniform approach to semi-dynamic problems on digraphs. *Theor. Comput. Sci.*, 203(1):69-90, 1998.
- Serafino Cicerone and Francesco Parisi-Presicce. On the complexity of specification morphisms. *Theor. Comput. Sci.*, 189(1-2):239-248, 1997.

Conferences

- Serafino Cicerone, Gabriele Di Stefano, Alfredo Navarra. "On Gathering of Semi-Synchronous Robots in Graphs". *Proceedings 21st International Symposium on Stabilization, Safety, and Security of Distributed Systems (SSS 2019)*, *Lecture Notes in Computer Science*, 2019. To appear.
- Serafino Cicerone, Gabriele Di Stefano, Alfredo Navarra. "Gathering Synchronous Robots in Graphs: from general properties to dense and symmetric topologies ". *Proceedings 26th Int.l Colloquium on Structural Information and Communication Complexity (SIROCCO'19)*, volume 11639 of *Lecture Notes in Computer Science*, pages 170-184, 2019.
- Serafino Cicerone, Gabriele Di Stefano, Leszek Gasieniec, Alfredo Navarra. "Asynchronous Rendezvous with different maps". *Proceedings 26th Int.l Colloquium on Structural Information and Communication Complexity (SIROCCO'19)*, volume 11639 of *Lecture Notes in Computer Science*, pages 154-169, 2019.
- Serafino Cicerone, Gabriele Di Stefano, Leszek Gasieniec, Tomasz Jurdzinski, Alfredo Navarra, Tomasz Radzik and Grzegorz Stachowiak. "Fair Hitting Sequence problem: scheduling activities with varied frequency requirements". *Proceedings 11th International Conference on Algorithms and Complexity (CIAC'19)*, volume 11845 of *Lecture Notes in Computer Science*, pages 174-186, 2019.
- Serafino Cicerone, Mattia D'Emidio and Daniele Frigioni. "On mining distances in large-scale dynamic graphs". *Proceedings 19th Italian Conference on Theoretical Computer Science (ICTCS18)*. *CEUR Workshop Proceedings*, pp 77-81, 2018.
- Serafino Cicerone, Gabriele Di Stefano, and Alfredo Navarra. "Semi-Asynchronous": a new scheduler for robot based computing systems. *38th IEEE International Conference on Distributed Computing Systems (ICDCS)*. *IEEE Computer Society*, DOI 10.1109/ICDCS.2018.00027, pp 176-187, 2018.
- Serafino Cicerone, Gabriele Di Stefano, and Alfredo Navarra. Asynchronous Embedded Pattern Formation without Orientation. *30th International Symposium on Distributed Computing (DISC'16)*, volume 9888 of *Lecture Notes in Computer Science*, pages 85-98. Springer, 2016.
- Serafino Cicerone, Gabriele Di Stefano, and Alfredo Navarra. Gathering of Robots on Meeting Points. *11th International Symposium on Algorithms and Experiments for Sensor Systems, Wireless Networks and Distributed Robotics (Algosensors'15)*, volume 9536 of *Lecture Notes in Computer Science*, pages 183-185. Springer, 2015.
- Serafino Cicerone, Gabriele Di Stefano, and Alfredo Navarra. MinMax-Distance Gathering on given Meeting Points. *9th International Conference on Algorithms and Complexity (CIAC'15)*, volume 9079 of *Lecture Notes in Computer Science*, pages 127-139. Springer, 2015. DOI: 10.1007/978-3-319-18173-8_9

- Serafino Cicerone, Gabriele Di Stefano, and Alfredo Navarra. Minimum-Traveled-Distance Gathering of Oblivious Robots over given Meeting Points. 10th International Symposium on Algorithms and Experiments for Sensor Systems, Wireless Networks and Distributed Robotics (Algosensors'14), volume 8847 of Lecture Notes in Computer Science, pages 57-72. Springer, 2014.
- Serafino Cicerone and Gabriele Di Stefano. Decomposing Octilinear Polygons into Triangles and Rectangles (extended abstract). I.J. Akiyama et al. (eds.): 16th Japan Conference on Discrete and Computational Geometry and Graphs (JCDCGG'13), volume 8845 of Lecture Notes in Computer Science, pages 1-13. Springer, 2014.
- Serafino Cicerone and Matteo Cermignani. Fast and Simple Approach for Polygon Schematization. 12th International Conference on Computational Science and Applications (ICCSA'12), volume 7333 of Lecture Notes in Computer Science, pages 267-279. Springer, 2012.
- Serafino Cicerone. Using split composition to extend distance-hereditary graphs in a generative way (extended abstract). 8th Annual Conference on Theory and Applications of Models of Computation (TAMC'11), volume 6648 of Lecture Notes in Computer Science, pages 286-297. Springer, 2011.
- Serafino Cicerone, Gianlorenzo D'Angelo, Gabriele Di Stefano, Daniele Frigioni, and Vinicio Maurizio. A new fully dynamic algorithm for distributed shortest paths and its experimental evaluation. In Paola Festa, editor, 9th International Symposium on Experimental Algorithms (SEA 2010), volume 6049 of Lecture Notes in Computer Science, pages 59-70. Springer, 2010.
- Serafino Cicerone, Antonio Orlandi, Bruce Archambeault, Sam Connor, Jun Fan, and Jim L. Drewniak. Cavities' identification algorithm for power integrity analysis of complex boards. In 20th Int. Zurich Symposium on Electromagnetic Compatibility (EMC-Zurich 2009). IEEE press, 2009.
- Serafino Cicerone, Gabriele Di Stefano, Michael Schachtebeck, and Anita Schöbel. Dynamic algorithms for recoverable robustness problems. In Matteo Fischetti and Peter Widmayer, editors, 8th Workshop on Algorithmic Approaches for Transportation Modeling, Optimization, and Systems (ATMOS 2008), volume 9 of OASICS, 2008.
- Serafino Cicerone, Gianlorenzo D'Angelo, Gabriele Di Stefano, Daniele Frigioni, and Alfredo Navarra. Delay management problem: Complexity results and robust algorithms. In Boting Yang, Ding-Zhu Du, and Cao An Wang, editors, 2nd Int. Conf. on Combinatorial Optimization and Applications (COCOA 2008), volume 5165 of Lecture Notes in Computer Science, pages 458-468. Springer, 2008.
- Francesco Bruera, Serafino Cicerone, Gianlorenzo D'Angelo, Gabriele Di Stefano, and Daniele Frigioni. Maintenance of multi-level overlay graphs for timetable queries. In Christian Liebchen, Ravindra K. Ahuja, and Juan A. Mesa, editors, 7th Workshop on Algorithmic Approaches for Transportation Modeling, Optimization, and Systems (ATMOS 2007), volume 7 of OASICS, 2007.
- Serafino Cicerone, Gianlorenzo D'Angelo, Gabriele Di Stefano, Daniele Frigioni, and Alfredo Navarra. Robust algorithms and price of robustness in shunting problems. In Christian Liebchen, Ravindra K. Ahuja, and Juan A. Mesa, editors, 7th Workshop on Algorithmic Approaches for Transportation Modeling, Optimization, and Systems (ATMOS 2007), volume 7 of OASICS, 2007.
- Gianlorenzo D'Angelo, Serafino Cicerone, Gabriele Di Stefano, and Daniele Frigioni. Partially dynamic concurrent update of distributed shortest paths. In Int. Conference on Computing: Theory and Applications (ICCTA 2007), pages 32-38. IEEE Computer Society, 2007.
- Serafino Cicerone and Paolino Di Felice. Cardinal directions between spatial objects: the pairwise-consistency problem (extended abstract). In 7th Int. Conference on Computer Science and Informatics (ICCSI 2003). ACM, 2003.
- Serafino Cicerone and Eliseo Clementini. Extraction of qualitative information from the weighted walkthroughs. In Agnès Voisard and Shu-Ching Chen, editors, 10th ACM International Symposium on Advances in Geographic Information Systems (ACM-GIS 2002), pages 137-142. ACM, 2002.
- Serafino Cicerone, Gianluca D'Ermiliis, and Gabriele Di Stefano. $(k,+)$ -distance-hereditary graphs. In Andreas Brandstädt and Van Bang Le, editors, 27th Int. Workshop Graph-Theoretic Concepts in Computer Science, (WG 2001),

volume 2204 of Lecture Notes in Computer Science, pages 66-77. Springer, 2001.

- Serafino Cicerone and Paolino Di Felice. Cardinal relations between regions with a broad boundary. In Ki-Joune Li, Kia Makki, Niki Pissinou, and Siva Ravada, editors, 8th ACM Symposium on Advances in Geographic Information Systems (ACM-GIS 2000), pages 15-20. ACM, 2000.
- Serafino Cicerone, Daniele Frigioni, and Paolino Di Felice. Decomposing spatial databases and applications. In 11th Int. Workshop on Database and Expert Systems Applications (DEXA 2000), pages 861-868. IEEE Computer Society, 2000.
- Serafino Cicerone, Daniele Frigioni, and Laura Tarantino. Interacting with geographic databases: A focus+context approach. In 11th Int. Workshop on Database and Expert Systems Applications (DEXA 2000), pages 869-875. IEEE Computer Society, 2000.
- Serafino Cicerone, Gabriele Di Stefano, Daniele Frigioni, and Umberto Nanni. A fully dynamic algorithm for distributed shortest paths. In Gaston H. Gonnet, Daniel Panario, and Alfredo Viola, editors, Theoretical Informatics, 4th Latin American Symposium (LATIN 2000), volume 1776 of Lecture Notes in Computer Science, pages 247-257. Springer, 2000.
- Serafino Cicerone, Daniele Frigioni, and Laura Tarantino. On the formalization of zoom-based interaction with geographic databases. In Ottavo Convegno Nazionale su Sistemi Evoluti per Basi di Dati (SEBD 2000), pages 401-414, 2000.
- Serafino Cicerone and Gabriele Di Stefano. Networks with small stretch number. In Ulrik Brandes and Dorothea Wagner, editors, 26th Int. Workshop on Graph-Theoretic Concepts in Computer Science (WG 2000), volume 1928 of Lecture Notes in Computer Science, pages 95-106. Springer, 2000.
- Serafino Cicerone, Daniele Frigioni, and Laura Tarantino. Supporting a focus+context interaction style for spatial databases. In Qing Li, Z. Meral Özsoyoglu, Roland Wagner, Yahiko Kambayashi, and Yanchun Zhang, editors, 1st International Conference on Web Information Systems Engineering (WISE 2000), pages 328-335. IEEE Computer Society, 2000.
- Serafino Cicerone, Daniele Frigioni, Laura Tarantino, and Paolino Di Felice. Interacting with topological invariants of spatial databases. In Int. Symposium on Database Applications in Non-Traditional Environments (DANTE 1999), pages 213-217. IEEE Computer Society, 1999.
- Serafino Cicerone, Gabriele Di Stefano, and Dagmar Handke. Survivable networks with bounded delay: The edge failure case. In Alok Aggarwal and C. Pandu Rangan, editors, 10th International Symposium on Algorithms and Computation (ISAAC 1999), volume 1741 of Lecture Notes in Computer Science, pages 205-214. Springer, 1999.
- Serafino Cicerone, Gabriele Di Stefano, and Michele Flammini. Compact-port routing models and applications to distance-hereditary graphs. In Cyril Gavoille, Jean-Claude Bermond, and André Raspaud, editors, 6th International Colloquium on Structural Information & Communication Complexity (SIROCCO 1999), pages 62-77. Carleton Scientific, 1999.
- Serafino Cicerone, Gabriele Di Stefano, and Michele Flammini. Static and dynamic low-congested interval routing schemes. In Kim Guldstrand Larsen, Sven Skyum, and Glynn Winskel, editors, 25th Int. Colloquium on Automata, Languages and Programming (ICALP 1998), volume 1443 of Lecture Notes in Computer Science, pages 592-603. Springer, 1998.
- Serafino Cicerone and Gabriele Di Stefano. Graphs with bounded induced distance. In Juraj Hromkovic and Ondrej Šýkora, editors, 24th Int. Workshop on Graph-Theoretic Concepts in Computer Science (WG 1998), volume 1517 of Lecture Notes in Computer Science, pages 177-191. Springer, 1998.
- Serafino Cicerone and Gabriele Di Stefano. On the equivalence in complexity among basic problems on bipartite and parity graphs. In Hon Wai Leong, Hiroshi Imai, and Sanjay Jain, editors, 8th Int. Symposium on Algorithms and Computation (ISAAC 1997), volume 1350 of Lecture Notes in Computer Science, pages 354-363. Springer, 1997.

- Serafino Cicerone, Daniele Frigioni, Umberto Nanni, and Francesco Pugliese. Counting edges in a dag. In Fabrizio d'Amore, Paolo Giulio Franciosa, and Alberto Marchetti-Spaccamela, editors, 22nd Int. Workshop on Graph-Theoretic Concepts in Computer Science (WG 1996), volume 1197 of Lecture Notes in Computer Science, pages 85-100. Springer, 1996.
- Serafino Cicerone and Gabriele Di Stefano. Graph classes between parity and distance-hereditary graphs. In 1st Discrete Mathematics and Theoretical Computer Science (DMTCS 1996), Combinatorics, Complexity, and Logic, pages 168-181. Springer, 1996.
- Serafino Cicerone and Francesco Parisi-Presicce. Strategies in modular system design by interface rewriting. In Donald Sannella, editor, 5th European Symposium on Programming Languages and Systems (ESOP 1994), volume 788 of Lecture Notes in Computer Science, pages 165-179. Springer, 1994.