Giorgio Audrito

Curriculum Vitae

ORCID: ***0000-0002-2319-0375***
Research ID: ***S-4613-2018***
Date of Birth: 17/12/1986
Nationality: Italian
http://giorgio.audrito.info/#!/research

Abstract

Giorgio Audrito published 37 works, including 12 journal papers, for an Hirsch-index 9 in Scopus and 11 in Google Scholar, and a total of 252 citations in Scopus and 373 in Google Scholar. One of his papers won the best paper award at the international conference COORDINATION 2017. He won the INdAM grant for young researchers, the Seal of Excellence for a MSCA-IF-GF proposal in 2019, two bronze medals at the International Olympiads in Informatics (2004 and 2005) and other prizes. He participated in the 7th Heidelberg Laureate Forum, where the recipients of the most prestigious awards in mathematics and computer science meet 200 young researchers selected worldwide.

He collaborated with different groups of researchers on different topics. His major collaborations in computer science comprise four topics: *aggregate computing* (J. Beal, S. Dasgupta, F. Damiani, M. Viroli), *games on graphs* (R. Rizzi), *didactics of informatics* (L. Laura, E. Giovannetti, R. Rizzi), and *speedup of dynamic programming algorithms* (P. Ferragina, M. Pinotti).

He participated to: Ateneo/CSP project *"Aggregate Computing"* (leading work package *"Algorithms"*); COST Action IC1402 *"ARVI: Runtime Verification beyond Monitoring"* (working group *"Core Runtime Verification"*); H2020 RIA project *"HyVar: Scalable Hybrid Variability for Distributed Evolving Software Systems"* (work package *"Design of the Domain Specific Variability Language"*); Ateneo/CSP project *"RunVar: Evolving Distributed Software Systems at Runtime by Scalable Hybrid Variability"* (leading work package *"Technical Design"*).

Research positions

01/09/2020–31/08/2023 **Junior lecturer ("RTDA") in computer science (INF/01)**, *Università di Torino*.

07/05/2020–31/08/2020 **Research grant holder ("borsista post-doc") on *"Aggregate Programming"***, *Supervisor: Prof. Ferruccio Damiani, Università di Torino*.

01/04/2019–30/04/2020 **Research fellow ("assegnista di ricerca") on *"Aggregate Programming"***, *Supervisor: Prof. Ferruccio Damiani, Università di Torino, Prof. Soura Dasgupta, University of Iowa*, research internazionalization grant 2018, Compagnia di San Paolo.

01/04/2018–31/03/2019 **Research fellow ("assegnista di ricerca") on *"Formal methods for the Internet of Things"***, *Supervisor: Prof. Ferruccio Damiani, Università di Torino*.

01/12/2017–31/03/2018 **Research grant holder ("borsista post-doc") on *"Formal methods for the Internet of Things"***, *Supervisor: Prof. Ferruccio Damiani, Università di Torino*.

01/01/2016–30/11/2017 **Research fellow ("assegnista di ricerca") on *"Formal methods for the Internet of Things"***, *Supervisor: Prof. Ferruccio Damiani, Università di Torino*.

01/01/2015–31/12/2015 **Research fellow ("assegnista di ricerca") on *"Design and development of algorithms and data structures for compressed data, with applications"***, *Supervisor: Prof. Paolo Ferragina, Università di Pisa*.

Education

02/03/2016 **Ph.D. in Mathematics *(logic and set theory)***, *Supervisor: Prof. Matteo Viale, Università degli Studi di Torino*.

06/04/2011 **Master of Science in Mathematics**, *Supervisor: Prof. Matteo Viale, Università degli Studi di Torino*, grade 110/110 cum laude and honorable mention.

07/10/2008 **Bachelor's degree in Mathematics**, *Supervisor: Prof. Guido Magnano, Università degli Studi di Torino*, grade 110/110 cum laude.

14/07/2005 **Scientific PNI High School Diploma**, *L.S. "M. Curie"*, Pinerolo, grade 100/100.

Non-scientific education

2016 Group Leader training for European Youth Exchanges, *Municipality of Torino*, 9 days.

2007–2011 Diplomas in Composition, Piano, Organ, *Conservatorio "G. Verdi"*, Torino.

Networking events, schools and long visiting periods

2019 **Research visit**, *University of Iowa*, Iowa City – US, September 30th to March 14th (6 months). Prof. Soura Dasgupta, Department of Electrical and Computer Engineering.

2019 **Heidelberg Laureate Forum**, *Networking conference*, Heidelberg – DE, 6 days.
https://www.heidelberg-laureate-forum.org/event_2019

2016 **ARVI COST Action summer school**, Madrid – ES, 3 days.
http://rv2016.imag.fr/?page_id=128

2016 **International School on Formal Methods**, Bertinoro – IT, 5 days.
http://www.sti.uniurb.it/events/sfm16quanticol

2012–2015 **Winter School in Abstract Analysis**, Hejnice – CZ, 4 editions, 1 week each.
https://winterschool.eu

2012 **Thematic Program on Forcing and its Applications**, *Fields Institute*, Toronto – CA, September 7th to December 16h (3 months).
https://www.fields.utoronto.ca/programs/scientific/12-13/forcing/participants.html

Honours and awards

2020 INdAM grant for young researchers, *"Reactive Aggregate Programming"* project.

2019 Seal of Excellence for the *"Model, Algorithms and Tools for the Internet of Things"* (MAT4IoT) project proposal, H2020-MSCA-IF-2019 call.

2017 Best Paper Award at the conference COORDINATION, with *Optimally-Self-Healing Distributed Gradient Structures through Bounded Information Speed* [C15].

2011 Winner of the *"Optime"* prize, *Unione Industriale* award for best graduates in Torino.

2008 First place in the national competition for scholarships *INdAM* for master's degree.

2005 First place in the national competition for scholarships *INdAM* for bachelor's degree.

2004–2005 Bronze medal at the *International Olympiads in Informatics*, both editions 2004 (Athens – GR) and 2005 (Nowi Sacz – PL).

2002–2005 Two gold medals, one silver medal and a honorable mention at the *Italian Mathematical Olympiads*, Cesenatico – IT.

Major scientific collaborations

- On the topic **Aggregate Computing**, collaboration with:
  - Dr. Jacob Beal. *Raytheon BBN Technologies*, USA.
  - Prof. Soura Dasgupta. *Dept. of Electr. and Comp. Engineering*, University of Iowa, USA.
  - Prof. Ferruccio Damiani. *Dept. of Computer Science*, University of Torino, Italy.
  - Prof. Mirko Viroli. *Dept. of Computer Science and Eng.* (DISI), University of Bologna, Italy.

G.A. contributed to the development of the Field Calculus model of Aggregate Computing (surveyed in [J5,C13]) and of its incarnations in the Protelis external Java DSL, ScaFi internal Scala DSL, FCPP internal C++ DSL (https://{protelis,scafi,fcpp}.github.io). He is currently playing a pivotal role in the design of the denotational semantics [J6,C8], the investigation of the expressive power of the model and its extensions [J3-4,C6-7,C12,W5], the design of efficient algorithms for aggregate computing [J2,J7,C1-4,C9,C14-15,W1,W3-4] possibly with real-time constraints [C10] or stabilisation properties [J8], the integration of field calculus with runtime verification techniques [J1,W2], the FCPP implementation of the model in C/C++ for microcontrollers [C2].

- On the topic **Games on Graphs**, collaboration with:
  - Prof. Romeo Rizzi. *Dept. of Computer Science*, University of Verona, Italy.

  Parity games on graphs have been applied to many areas in informatics and are a paradigmatic example of a problem both in NP and in co-NP not known to be in P. G.A. is currently working with Romeo Rizzi on sub-exponential algorithms for parity game solving, both in special and in general cases.

- On the topic **Speedup of Dynamic Programming Algorithms**, collaboration with:
  - Prof. Paolo Ferragina. *Dept. of Computer Science*, University of Pisa, Italy.
  - Prof. Cristina M. Pinotti. *Dept. of Computer Science*, University of Perugia, Italy.

  G.A. worked with Prof.s Ferragina and Pinotti on the speed up of dynamic programming algorithms for optimal managing of resources in broadcast networks [J9, C16].

- On the topic **Didactics of Informatics**, collaboration with:
  - Dr. Luigi Laura. *DIAG Department*, "Sapienza" University of Roma, Italy.
  - Prof. Elio Giovannetti. *Dept. of Computer Science*, University of Torino, Italy.
  - Prof. Romeo Rizzi. *Dept. of Computer Science*, University of Verona, Italy.

  G.A. is currently working with a team in the Informatics Olympiads on new ways to foster informatics education in secondary education, including online platforms and team contests [C5, C11, C17, B1].

Project participation

- **Ateneo/CSP project: *Aggregate Programming*** (http://ap-project.di.unito.it, start: 01/03/2019, duration: 24 months). The project concerns an alternate approach to the device-centric development methodology, aiming to dramatically simplify the design, creation, and maintenance of complex and large scale software systems, in the context of (Industrial) IoT, cyber-physical systems, pervasive computing, robotic swarms, and large-scale situated systems. G.A. leads Work Package 2 *Algorithms* on the development of novel aggregate algorithms.

- **COST Action IC1402 ARVI: *Runtime Verification beyond Monitoring*** (https://www.cost-arvi.eu, start: 17/12/2014, duration: 48 months). The project concerns the employment of Runtime Verification techniques in novel areas, generalising the concept to systems that are not traditional computer programs, such as hardware, devices, cloud computing, and human centric systems. G.A. worked, in the context of Working Group 1 *Core Runtime Verification* on exploiting aggregate computing for distributed runtime verification. He attended the ARVI summer school in 2016.

- **H2020 RIA project HyVar: *Scalable Hybrid Variability for Distributed Evolving Software Systems*** (http://www.hyvar-project.eu, start: 01/02/2015, duration: 36 months). The project addressed continuous software evolution in distributed systems through a framework for hybrid variability, consisting of a domain specific variability language to describe software evolution as a product line, together with cloud infrastructures for monitoring and customised over-the-air upgrade technologies. G.A. worked on Work Package 2 *Design of the Domain Specific Variability Language* led by Prof. Ferruccio Damiani.

- **Ateneo/CSP project RunVar: *Evolving Distributed Software Systems at Runtime by Scalable Hybrid Variability*** (http://runvar-project.di.unito.it, start: 01/07/2015, duration: 30 months). The project was aimed at investigating development frameworks for runtime evolution of distributed software applications, through behavioural types, delta-oriented programming of software product lines and field-based programming of collective adaptive systems. G.A. led Work Package 2 *Technical Design* and worked on runtime updates of distributed systems specified by the field calculus.

Experience in project proposal writing (not funded, threshold passed)

2020 Participation in the DTM4TIES proposal, H2020-ICT-2018-20 call.

2020 Participation in the ACUMEN proposal, H2020-JPI-EN-UAC call.

2019 Preparation of the MAT4IoT proposal, H2020-MSCA-IF-2019 call (seal of excellence).

2019 Participation in the NewEdge proposal, H2020-ICT-2018-20 call.

2018 Preparation of the MAT4IoT proposal, H2020-MSCA-IF-2018 call.

Membership in scientific organizations and committees

Conference and workshop committees

2021 PC member, *ACSOS conference*, Washington DC – US.
https://conf.researchr.org/home/acsos-2021

2021 Tool Track Chair and PC member, *COORDINATION conference*, Valletta – MT.
https://www.discotec.org/2021/coordination

2020 Chair, *eCAS workshop, ACSOS conference*, Washington DC – US.
http://ecas2020.apice.unibo.it

2019 PC member, *VORTEX workshop, ECOOP conference*, London – UK.
https://2019.ecoop.org/home/vortex-2019

2018 AEC (Artifact Evaluation Committee) member, *OOPSLA track, SPLASH conference*, Boston – US. GGS A+ https://2018.splashcon.org

2018 PC member, *FAS* conference Posters and Demos*, Trento – IT.
https://saso2018.fbk.eu

2017 AEC (Artifact Evaluation Committee) member, *OOPSLA track, SPLASH conference*, Vancouver – CA. GGS A+ https://2017.splashcon.org

2017 Local Organization Co-Chair, *iFM conference*, Torino – IT.
http://ifm2017.di.unito.it

2017 PC member, *ALP4IoT workshop, iFM conference*, Torino – IT.
http://apice.unibo.it/xwiki/bin/view/ALP4IoT2016/WebHome

2017 PC member, *eCAS workshop, SASO conference*, Tucson – US.
http://ecas2017.apice.unibo.it

2013 Local Organizer, *Young Set Theory Workshop*, Oropa – IT.
https://ests.wordpress.com/2012/12/21/6th-young-set-theory-workshop

Governing bodies of scientific organizations

2020–present Member of the *Olympic Committee* for the *Italian Olympiads in Informatics*, as representative of the Italian University.
https://www.olimpiadi-informatica.it/index.php/oii/organizzazione.html

Scientific associations

2020–present Member of the *EAPLS* (European Association for Programming Languages and Systems). https://eapls.org

2020–present Member of the *GNCS* (Gruppo Nazionale per il Calcolo Scientifico), *INdAM* (Istituto Nazionale di Alta Matematica). https://www.altamatematica.it/gncs/aderenti

Publications

Giorgio Audrito published 37 works, including 12 journal papers, for an Hirsch-index 9 in Scopus and 11 in Google Scholar, and a total of 252 citations in Scopus and 373 in Google Scholar.Each work is listed together with the number of citations in Scopus (s#) and in Google Scholar (g#), the SCImago Journal Rank (SJR) and Source Normalized Impact per Paper (SNIP) for journal papers, and the GII-GRIN-SCIE (GGS) rating for conference proceedings. The SJR, SNIP, GGS indicators are referred to years 2019 and 2018.

Journal papers (peer-reviewed)

[J1] *Adaptive Distributed Monitors of Spatial Properties for Cyber-Physical Systems.* Giorgio Audrito, Roberto Casadei, Ferruccio Damiani, Volker Stolz, Mirko Viroli. *Journal of Systems and Software* 175, 2021. DOI: 10.1016/j.jss.2021.110908. SJR 0.772 SNIP 2.387

[J2] *Aggregate Centrality Measures for IoT-based Coordination.* Giorgio Audrito, Danilo Pianini, Ferruccio Damiani, Mirko Viroli. *Science of Computer Programming* 203, 2021. DOI: 10.1016/j.scico.2020.102584. SJR 0.366 SNIP 1.099

[J3] *Engineering Collective Intelligence at the Edge with Aggregate Processes.* Roberto Casadei, Mirko Viroli, Giorgio Audrito, Danilo Pianini, Ferruccio Damiani. *Engineering Applications of Artificial Intelligence* 97, 2021. DOI: 10.1016/j.engappai.2020.104081. SJR 1.011 SNIP 2.139 s#2 g#4

[J4] *Field-based Coordination with the share Operator.* Giorgio Audrito, Jacob Beal, Ferruccio Damiani, Danilo Pianini, Mirko Viroli. *Logical Methods in Computer Science* 16(4), pp. 1–41, 2020. DOI: 10.23638/LMCS-16(4:1)2020. SJR 0.558 SNIP 0.955 s#1 g#3

[J5] *From Distributed Coordination to Field Calculus and Aggregate Computing.* Mirko Viroli, Jacob Beal, Ferruccio Damiani, Giorgio Audrito, Roberto Casadei, Danilo Pianini. *Journal of Logical and Algebraic Methods in Programming* 109, 2019. DOI: 10.1016/j.jlamp.2019.100486. SJR 0.427 SNIP 1.019 s#12 g#20

[J6] *A Higher-order Calculus of Computational Fields.* Giorgio Audrito, Mirko Viroli, Ferruccio Damiani, Danilo Pianini, Jacob Beal. *ACM Transactions on Computational Logic* 20(1), pp. 5:1–5:55, 2019. DOI: 10.1145/3285956. SJR 0.572 SNIP 1.095 s#32 g#46

[J7] *Optimal Single-Path Information Propagation in Gradient-based Algorithms.* Giorgio Audrito, Ferruccio Damiani, Mirko Viroli. *Science of Computer Programming* 166, pp. 146–166, 2018. DOI: 10.1016/j.scico.2018.06.002. SJR 0.366 SNIP 1.099 s#12 g#14

[J8] *Engineering Resilient Collective Adaptive Systems by Self-Stabilisation.* Mirko Viroli, Giorgio Audrito, Jacob Beal, Ferruccio Damiani, Danilo Pianini. *ACM Transactions on Modeling and Computer Simulation* 28(2), pp. 16:1–16:28, 2018. DOI: 10.1145/3177774. SJR 0.431 SNIP 1.866 s#43 g#57

[J9] *Maximizing the Overall End-User Satisfaction of Data Broadcast in Wireless Mesh Networks.* Giorgio Audrito, Alan A. Bertossi, Alfredo Navarra, Cristina M. Pinotti. *Journal of Discrete Algorithms* 45C, pp. 14–25, Elsevier, 2017. DOI: 10.1016/j.jda.2017.07.002. SJR 0.293 SNIP 0.986 s#6 g#7

[J10] *Absoluteness via Resurrection.* Giorgio Audrito, Matteo Viale. *Journal of Mathematical Logic* 17(2), World Scientific, 2017. DOI: 10.1142/S0219061317500052. SJR 2.494 SNIP 2.554 s#7 g#15

[J11] *Generic Large Cardinals and Systems of Filters.* Giorgio Audrito, Silvia Steila. *Journal of Symbolic Logic* 82(3), pp. 860–892, Cambridge University Press, 2017. DOI: 10.1017/jsl.2017.27. SJR 1.012 SNIP 1.248 s#1 g#3

[J12] *Enumeration of the adjunctive hierarchy of hereditarily finite sets.* Giorgio Audrito, Alexandru I. Tomescu, Stephan Wagner. *Journal of Logic and Computation* 25(3), pp. 943–963, Oxford University Press, 2015. DOI: 10.1093/logcom/exu062. SJR 0.786 SNIP 1.481 s#1 g#10

Conference proceedings (peer-reviewed)

[C1] *A Resilient Leader Election Algorithm Using Aggregate Computing Blocks.* Yuanqiu Mo, Giorgio Audrito, Soura Dasgupta, Jacob Beal. *IFAC World Congress*, 2020.

[C2] *FCPP: an efficient and extensible Field Calculus framework.* Giorgio Audrito. *IEEE International Conference on Autonomic Computing and Self-Organizing Systems (ACSOS)*, pp. 153–159, 2020. DOI: 10.1109/ACSOS49614.2020.00037. g#1

[C3] *FScaFi: a Core Calculus for Collective Adaptive Systems Programming.* Roberto Casadei, Mirko Viroli, Giorgio Audrito, Ferruccio Damiani. *International Symposium On Leveraging Applications of Formal Methods, Verification and Validation (ISOLA)*, Lecture Notes in Computer Science 12477, pp. 344–360, 2020. DOI: 10.1007/978-3-030-61470-6_21. s#3 g#4

[C4] *Resilient Distributed Collection through Information Speed Thresholds.* Giorgio Audrito, Sergio Bergamini, Ferruccio Damiani, Mirko Viroli. *International Conference on Coordination Languages and Models (COORDINATION)*, Lecture Notes in Computer Science 12134, pp. 211–229, Springer, 2020. DOI: 10.1007/978-3-030-50029-0_14. s#1 g#1

[C5] *Recommending Tasks in Online Judges.* Giorgio Audrito, Tania Di Mascio, Paolo Fantozzi, Luigi Laura, Gemma Martini, Umberto Nanni, Marco Temperini. *International Conference on Methodologies and Intelligent Systems for Technology Enhanced Learning (MIS4TEL)*, Advances in Intelligent Systems and Computing 1007, pp. 129–136, Springer, 2019. DOI: 10.1007/978-3-030-23990-9_16. s#2 g#2

[C6] *The Share Operator for Field-Based Coordination.* Giorgio Audrito, Jacob Beal, Ferruccio Damiani, Danilo Pianini, Mirko Viroli. *International Conference on Coordination Languages and Models (COORDINATION)*, Lecture Notes in Computer Science 11533, pp. 54–71, Springer, 2019. DOI: 10.1007/978-3-030-22397-7_4. s#4 g#5

[C7] *Aggregate Processes in Field Calculus.* Roberto Casadei, Mirko Viroli, Giorgio Audrito, Danilo Pianini, Ferruccio Damiani. *International Conference on Coordination Languages and Models (COORDINATION)*, Lecture Notes in Computer Science 11533, pp. 200–217, Springer, 2019. DOI: 10.1007/978-3-030-22397-7_12. s#6 g#9

[C8] *On a Higher-Order Calculus of Computational Fields.* Giorgio Audrito, Mirko Viroli, Ferruccio Damiani, Danilo Pianini, Jacob Beal. *International Conference on Formal Techniques for Distributed Objects, Components, and Systems (FORTE)*, Lecture Notes in Computer Science 11535, pp. 289–292, Springer, 2019. DOI: 10.1007/978-3-030-21759-4_17. Journal-first track (four pages summary of [J6]).

[C9] *Effective Collective Summarisation of Distributed Data in Mobile Multi-Agent Systems.* Giorgio Audrito, Sergio Bergamini, Ferruccio Damiani, Mirko Viroli. *International Conference on Autonomous Agents and Multiagent Systems (AAMAS)*, pp. 1618–1626, ACM, 2019. DOI: 10.5555/3306127.3331882. GGS A+ s#8 g#10

[C10] *Distributed Real-Time Shortest-Paths Computations with the Field Calculus.* Giorgio Audrito, Ferruccio Damiani, Mirko Viroli, Enrico Bini. *IEEE Real-Time Systems Symposium (RTSS)*, pp. 23–34, 2018. DOI: 10.1109/RTSS.2018.00013. GGS A+ s#6 g#7

[C11] *Fostering Informatics Education through Teams Olympiad.* Nadia Amaroli, Giorgio Audrito, Luigi Laura. *Olympiads in Informatics* 12, pp. 133-146, 2018. DOI: 10.15388/ioi.2018.11. s#2 g#2

[C12] *Space-Time Universality of Field Calculus.* Giorgio Audrito, Jacob Beal, Ferruccio Damiani, Mirko Viroli. *International Conference on Coordination Languages and Models (COORDINATION)*, Lecture Notes in Computer Science 10852, pp. 1–20, Springer, 2018. DOI: 10.1007/978-3-319-92408-3_1. s#14 g#22

[C13] *From Field-Based Coordination to Aggregate Computing.* Mirko Viroli, Jacob Beal, Ferruccio Damiani, Giorgio Audrito, Roberto Casadei, Danilo Pianini. *International Conference on Coordination Languages and Models (COORDINATION)*, Lecture Notes in Computer Science 10852, pp. 252–279, Springer, 2018. DOI: 10.1007/978-3-319-92408-3_12. s#20 g#28

[C14] *Compositional Blocks for Optimal Self-Healing Gradients.* Giorgio Audrito, Roberto Casadei, Ferruccio Damiani, Mirko Viroli. *11th IEEE International Conference on Self-Adaptive and Self-Organizing Systems (SASO)*, pp. 91–100, 2017. DOI: 10.1109/SASO.2017.18. s#25 g#32

[C15] *Optimally-Self-Healing Distributed Gradient Structures through Bounded Information Speed.* Giorgio Audrito, Ferruccio Damiani, Mirko Viroli. *International Conference on Coordination Languages and Models (COORDINATION)*, Lecture Notes in Computer Science 10319, pp. 59–77, Springer, 2017. DOI: 10.1007/978-3-319-59746-1_4. s#14 g#17

[C16] *Optimal Skewed Allocation on Multiple Channels for Broadcast in Smart Cities.* Giorgio Audrito, Daniele Diodati, Cristina M. Pinotti. *IEEE International Conference on Smart Computing (SMARTCOMP)*, pp. 1–8, 2016. DOI: 10.1109/SMARTCOMP.2016.7501711.

[C17] *The Role of Contests in Changing Informatics Education, a Local View.* Giorgio Audrito, G. Barbara Demo, Elio Giovannetti. *Olympiads in Informatics* 6, pp. 3–20, 2012. s#8 g#14

Workshop proceedings and post-proceedings (peer-reviewed)

[W1] *Improving Collection Dynamics by Monotonic Filtering.* Hunza Zainab, Giorgio Audrito, Soura Dasgupta, Jacob Beal. *Workshop on Engineering Collective Adaptive Systems (eCAS)*, IEEE International Conference on Autonomic Computing and Self-Organizing Systems Companion, pp. 127–132, 2020. DOI: 10.1109/ACSOS-C51401.2020.00043.

[W2] *On distributed runtime verification by aggregate computing.* Giorgio Audrito, Ferruccio Damiani, Volker Stolz, Mirko Viroli. Post-proceedings of *Verification of Objects at Runtime Execution (VORTEX 2018)*, Electronic Proceedings in Theoretical Computer Science 302, pp. 47–61, 2019. DOI: 10.4204/EPTCS.302.4. s#1 g#1

[W3] *Aggregate Graph Statistics.* Giorgio Audrito, Ferruccio Damiani, Mirko Viroli. *Workshop on Architectures, Languages and Paradigms for IoT (ALP4IoT)*, Electronic Proceedings in Theoretical Computer Science 264, pp. 18–22, 2018. EPTCS. DOI: 10.4204/EPTCS.264.2. s#4 g#4

[W4] *Resilient Blocks for Summarising Distributed Data.* Giorgio Audrito, Sergio Bergamini. *Workshop on Architectures, Languages and Paradigms for IoT (ALP4IoT)*, Electronic Proceedings in Theoretical Computer Science 264, pp. 23–26, 2018. DOI: 10.4204/EPTCS.264.3. s#6 g#6

[W5] *Run-Time Management of Computation Domains in Field Calculus.* Giorgio Audrito, Ferruccio Damiani, Mirko Viroli, Roberto Casadei. *Workshop on Engineering Collective Adaptive Systems (eCAS)*, pp. 192–197, 2016. DOI: 10.1109/FAS-W.2016.50. s#11 g#18

Books and book chapters (in italian)

[B1] *Le olimpiadi di informatica in Italia.* Giorgio Audrito, Romeo Rizzi. In "Vedere la matematica... alla maniera di Mimmo Luminati", *ETS - Pisa*, 2015. ISBN: 9788846742797.

[B2] *Esplorazione dei solidi e oltre: fare geometria con gli Zometool.* Giorgio Audrito, Ubertino Battisti, Massimo Borsero, Alberto Raffero, Saverio Tassoni, Luisa Testa, edited by Ornella Robutti. *Ledizioni*, 2016. ISBN: 9788867054114.

[B3] *Dispense di matematica olimpionica.* Andrea Astolfi, Giorgio Audrito, Alberto Carignano, Fabio Tanturri. *Quaderni di matematica dell'associazione subalpina Mathesis*, 2010.

Talks

19/08/2020 *FCPP: an efficient and extensible field calculus framework*. ACSOS, Washington – US (online, planned). https://2020.acsos.org/info/program

18/06/2020 *Resilient Distributed Collection through Information Speed Thresholds*. COORDINATION, Valletta – MT (online). https://www.discotec.org/2020/programme

19/07/2019 *A Field Calculus Implementation of Spatial Logic*. VORTEX, London – UK. https://2019.ecoop.org/home/vortex-2019#program

18/06/2019 *The share operator for field-based coordination*. COORDINATION, Copenhagen – DK. http://www.discotec.org/2019/programme

17/05/2019 *Effective Collective Summarisation of Distributed Data in Mobile Multi-Agent Systems*. AAMAS, Montreal – CA. http://aamas2019.encs.concordia.ca/detailedprogram.html

12/12/2018 *Distributed Real-Time Shortest-Paths Computations with the Field Calculus*. RTSS, Nashville – US. http://2018.rtss.org/program

12/12/2018 *Simulation of Field Calculus-based IoT Applications with Real-Time Guarantees*. RTSS@Work, Nashville – US. http://2018.rtss.org/rtsswork

03/09/2018 *Fostering Informatics Education through Teams Olympiad*. IOI conference, Tsukuba – JP. https://ioi2018.jp/wp-content/uploads/2018/08/Agenda-IOI-Conference_2018.pdf

18/06/2018 *Space-Time Universality of Field Calculus*. COORDINATION track, DisCoTec, Madrid – ES. http://2018.discotec.org/pdf/program_conferences.pdf

18/09/2017 *Aggregate Graph Statistics*. ALP4IoT workshop, iFM, Torino – IT. http://apice.unibo.it/xwiki/bin/view/ALP4IoT2016/WebHome

19/06/2017 *Optimally-Self-Healing Distributed Gradient Structures through Bounded Information Speed*. COORDINATION track, DisCoTec, Neuchâtel – CH. http://2017.discotec.org/program.html

19/04/2017 *Memoization of Parity Games: a practical proposal*. Seminari del Dipartimento di Informatica, Verona – IT. http://www.di.univr.it/?ent=seminario&id=3956

12/09/2016 *Run-time Management of Computation Domains in Field Calculus*. eCAS workshop, SASO, FAS*, Augsburg – DE. http://apice.unibo.it/xwiki/bin/view/ECAS2016/Program

28/10/2015 *Systems of Filters*, poster. Young Set Theory Workshop, Jerusalem – IL.

08/09/2015 *Generic absoluteness and resurrection axioms*. XX congresso dell'UMI, Siena – IT. http://umi.dm.unibo.it/congresso2015/programma

01/02/2015 *Resurrection axioms and generic absoluteness*. Winterschool in Abstract Analysis, Hejnice – CZ. https://www.winterschool.eu/2015/program

18/08/2014 *Absoluteness via Resurrection*. SetTop, Novi Sad – RS. http://www.dmi.uns.ac.rs/settop/2014/talks.html

15/04/2014 *Absoluteness via Resurrection*. XXV incontro dell'AILA, Pisa – IT. http://ailapisa2014.weebly.com/programme.html

02/04/2014 *Dimostrabilità, assolutezza generica e assiomi di resurrezione*, seminar. Seminari dei dottorandi, Torino – IT. https://www.mathematics-phdseminars.unito.it/past-seminars

Teaching and mentoring experiences

PhD program

2020/21 Teacher for *"Aggregate Programming for the Internet of Things"*.
Dottorato in Informatica, Università degli Studi di Torino, Italy.
https://dott-informatica.campusnet.unito.it/do/corsi.pl/Show?_id=ws7g

2020–2021 Co-supervisor for the PhD thesis of Hunza Zainab.
Electrical Engineering major, University of Iowa, US (ongoing).

2019/20 Primary Instructor for *"Aggregate Programming for the Internet of Things"*. *Dept. of Electrical and Computer Engineering*, University of Iowa (Iowa City, IA, USA).
https://myui.uiowa.edu/my-ui/courses/details.page?id=906087&ci=148347

Master program

2021 Co-supervisor for the Master thesis of Sergio Bergamini. *Laurea Magistrale in Informatica*, Università degli Studi di Torino, Italy (ongoing).

2020 Co-supervisor for the Master thesis of Lorenzo Testa, Mirko Guani. *Laurea Magistrale in Informatica*, Università degli Studi di Torino, Italy.

2016/17–2019/20 Invited lecturer for the *Mobile Device Programming* course **(12 hours of frontal lessons)**. *Laurea Magistrale in Informatica*, Università degli Studi di Torino.

Bachelor program

2021 Supervisor for the Bachelor thesis of Luigi Rapetta.
Laurea in Informatica, Università degli Studi di Torino, Italy. (ongoing)

2020 Co-supervisor for the Bachelor thesis of Matteo Miceli and Matteo Zattoni.
Laurea in Informatica, Università degli Studi di Torino, Italy.

2017/18 Co-supervisor for the Bachelor thesis of Sergio Bergamini and Luca Serena.
Laurea in Informatica, Università degli Studi di Torino, Italy.

2016/17–2018/19 Adjunct Professor for the *Object-Oriented Programming* course. *Laurea in Informatica*, Università del Piemonte Orientale (Vercelli, Italy). In the academic years 2016/17, 2017/18, 2018/19 **he taught 144 hours total of frontal lessons, and examined about 80 students.** https://upobook.uniupo.it/personale/1486

2016/17 Teaching assistant "articolo 76" for the *Informatics* course **(25 hours of frontal lessons)**. *Laurea in Matematica*, Università degli Studi di Torino.

University orientation for high-school students

2011/12 Teaching assistant "articolo 33" for the *University Orientation* course **(25 hours of frontal lessons)**. *Dipartimento di Informatica*, Università degli Studi di Torino.

2010/11 Teaching assistant "articolo 13" for the *University Orientation* course **(25 hours of frontal lessons)**. *Dipartimento di Informatica*, Università degli Studi di Torino.

Teaching for the olympiads in informatics

2014–present Technical coordinator of the *Italian Informatics Olympiads in Teams* (OIS, http://oisquadre.it), a national-level competition for high school students. Main role: preparing tasks for the competitions.

2013–present Team leader at the *International Olympiads in Informatics* (IOI, http://ioinformatics.org), editions 2013 (Brisbane – AU), 2014 (Taipei – TW), 2015 (Almaty – KZ), 2016 (Kazan – RU), 2017 (Tehran – IR), 2018 (Tsukuba – JP), 2019 (Baku – AZ), 2020 (Singapore – SG). Main role: represent Italy in the IOI assembly, translate tasks in Italian, accompany the Italian contestants.

2006–present Teaching assistant in national-level classes for the *Italian Informatics Olympiads* (OII, https://olimpiadi-informatica.it, https://olinfo.it). Main role: giving lectures, preparing tasks and selecting the Italian team for the IOI.

2017 Technical coordinator of the first edition of the *International Informatics Olympiad in Teams* (IIOT, http://iio.team), an international-level competition, Bologna – IT. Main role: preparing tasks for the competitions.

Teaching for the olympiads in mathematics

2014–2016 Lecturer and organizer for project PLSTO10 in *"Piano Lauree Scientifiche" (scientific degrees plan)*, a national program for scientific education in high schools.

2006–2014 Teacher in olympic mathematic classes, Associazione Subalpina Mathesis.

Mentoring for the olympiads in informatics and other events

2013–present Mentoring the Italian team at the International Olympiad in Informatics (one week to 4 students each year). Main role: accompanying and training the contestants. https://www.olimpiadi-informatica.it

2016–present Mentoring groups (of 10 people total) in two European Youth Exchanges.

Software design and development

FCPP	Aggregate computing language and simulator	*(main designer and developer)*
ScaFi	Aggregate computing language	*(semantic fixes and implementation of constructs)*
Protelis	Aggregate computing language	*(implementation of language constructs)*
Alchemist	Pervasive systems simulator	*(integration of functionalities)*

Other technical skills

Advanced	C/C++	Google Test *framework (test-driven development)*, OpenGL *(3D graphical interfaces)*, openmp *and* MPI *(parallel programming)*, sdsl-lite *library (succinct data structures)*, Bazel *and* CMake *tools (automated building and testing)*, doxygen *tool (documentation)*.
	Python, Bash	sqlalchemy *library (database management)*, django *framework (web sites and applications)*, pygtk/pygobject *library (graphical user interface)*.
	Java	JUnit *framework (test-driven development)*, Swing *library (graphical user interfaces)*, javadoc *tool (documentation)*.
	C#	Unity *(cross-platform game engine)*.
	Maple	*symbolic calculations, data plotting and interpolation.*
	Asymptote	*vector graphics.*

Intermediate	Html, Javascript	AngularJS, VueJS, Bootstrap *(web site design).*
	Pascal	*didactic programming.*
Basic	Matlab, Statistica	*linear algebra and statistical computations.*
	Scheme	*batch image processing language for* GIMP.
	AviSynth	*video-processing scripting language.*

Languages written and spoken

Italian	Mother tongue	
English	Advanced	*self-assessed european level C1.*
French	Intermediate	*self-assessed european level B1.*
Spanish	Basic	*self-assessed european level A2.*