# 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 28 works, including 8 journal papers, for an Hirsch-index 6 in Scopus and 10 in Google Scholar, and a total of 108 citations in Scopus and 222 in Google Scholar. One of his papers got the best paper award at the international conference COORDINATION 2017. He got 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, 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 is currently participating to the Ateneo/CSP project *"Aggregate Computing"* (leading work package *"Algorithms"*) and participated to: 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"*).

## Education and research experience

### Research positions

01/04/2019–31/03/2020 **Research assistant ("assegnista di ricerca") on *"Aggregate Programming"***, *Supervisor: Prof. Ferruccio Damiani, Università di Torino*, research internazionalization grant 2018, Compagnia di San Paolo.

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

01/01/2016–30/11/2017 **Research assistant ("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 assistant ("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 (National Plan for Informatics) High School Diploma**, *Liceo scientifico "M. Curie"*, Pinerolo, grade 100/100.

### Networking Conferences

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

### Schools

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

### Long visiting periods

2019 **Research visit**, *University of Iowa*, Iowa City – US, September 30th to March 30th (6 months, ongoing).

2012 **Thematic Program on Forcing and its Applications**, *Fields Institute*, Toronto – CA, 3 months.
https://www.fields.utoronto.ca/programs/scientific/12-13/forcing/participants.html

### 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.

## Honours and awards

2017 Best Paper Award at the conference COORDINATION, with *Optimally-Self-Healing Distributed Gradient Structures through Bounded Information Speed* [C11].

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 collaborations

- On the topic **Aggregate Computing**, collaboration with:
  - Dr. Jacob Beal. *Raytheon BBN Technologies*, USA.
  - Prof. Ferruccio Damiani. *Dept. of Computer Science*, University of Torino, Italy.
  - Prof. Mirko Viroli. *Dept. of Computer Science*, University of Bologna, Italy.

  G.A. contributed to the development of the Field Calculus model of Aggregate Computing (surveyed in [C9]) and of its incarnations in the Protelis external Java DSL (https://protelis.github.io) and ScaFi internal Scala DSL (https://scafi.github.io), and is currently playing a pivotal role the design of the denotational semantics [J2,C4], the investigation of the expressive power of the model and its extensions [C2-3,C8,W4], the design of efficient algorithms for aggregate computing [J3,C5,C10-11,W2-3] possibly with real-time constraints [C6] or stabilisation properties [J4], the integration of field calculus with runtime verification techniques [W1], the ongoing implementation of the model in C/C++ for microcontrollers.

- 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 [J5, C12].
- 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 [C1, C7, C13, 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 standard device-centered 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 algorithms for aggregate systems.
- **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.

## Membership in conference and workshop committees

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 rating 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 rating A++ https://2017.splashcon.org

2017 Local Organization Co-Chair, *iFM conference*, Torino – IT. GGS rating B 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

## Publications

Giorgio Audrito published 28 works, including 8 journal papers, for an Hirsch-index 6 in Scopus and 10 in Google Scholar, and a total of 108 citations in Scopus and 222 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 year 2017.

### Journal papers (peer-reviewed)

[J1] *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 0.325 SNIP 0.969

[J2] *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 0.573 SNIP 1.607 s#16 g#20

[J3] *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 0.3 SNIP 1.041 s#3 g#8

[J4] *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 0.46 SNIP 1.151 s#20 g#28

[J5] *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 0.549 SNIP 1.156 s#2 g#2

[J6] *Absoluteness via Resurrection.* Giorgio Audrito, Matteo Viale. *Journal of Mathematical Logic* 17(2), World Scientific, 2017. DOI: 10.1142/S0219061317500052. SJR 2.166 SNIP 1.610 s#7 g#11

[J7] *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 1.057 SNIP 1.285 s#1 g#3

[J8] *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 0.381 SNIP 1.135 s#1 g#10

### Conference proceedings (peer-reviewed)

[C1] *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.

[C2] *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. GGS B g#3

[C3] *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. GGS B g#3

[C4] *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 [J2]). GGS B

[C5] *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. GGS A+ g#6 https://dl.acm.org/citation.cfm?id=3331882

[C6] *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#1 g#3

[C7] *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#1 g#1

[C8] *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. GGS B s#5 g#13

[C9] *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. GGS B s#14 g#22

[C10] *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#13 g#22

[C11] *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. GGS B s#9 g#16

[C12] *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.

[C13] *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#6 g#10

### Workshop proceedings and post-proceedings (peer-reviewed)

[W1] *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. g#2

[W2] *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#1 g#3

[W3] *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#2 g#5

[W4] *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#6 g#14

### 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. Available at: https://dmi.units.it/divulgazione/matCultSoc/olimpia10/gomut/dispense_olimpioniche.pdf

## Talks

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

### University teaching

2016/17–2018/19 Adjunct Professor for the *Object-Oriented Programming* course. *Computer Science* major, 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

2016/17–2018/19 Invited lecturer for the *Mobile Device Programming* course **(8 hours of frontal lessons)**. *Computer Science* major, Università degli Studi di Torino.

2016/17 Teaching assistant "articolo 76" for the *Informatics* course **(25 hours of frontal lessons)**. *Mathematics for Finance and Insurance* major, Università degli Studi di Torino.

2011/12 Teaching assistant "articolo 33" for the *University Orientation* course for high-school students **(25 hours of frontal lessons)**. *Computer Science* major, Università degli Studi di Torino.

2010/11 Teaching assistant "articolo 13" for the *University Orientation* course for high-school students **(25 hours of frontal lessons)**. *Computer Science* major, Università degli Studi di Torino.

### University mentoring

2017/18 Co-supervisor for the Bachelor thesis of Sergio Bergamini and Luca Serena. *Computer Science* major, 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). 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.

## Technical skills

| | | |
|---|---|---|
| Developer | Aggregate Computing Toolchain | Protelis *language (external Java DSL)*, ScaFi *language (internal Scala DSL)*, Alchemist *simulator of pervasive computing systems.* |
| Advanced | C/C++ | Google Test *framework (test-driven development)*, openmp *API (parallel programming)*, sdsl-lite *library (succinct data structures)*, Bazel *tool (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).* |
| | Maple | *symbolic calculations, data plotting and interpolation.* |
| | Asymptote | *vector graphics.* |
| Intermediate | Html, Javascript | AngularJS, 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.* |