Roberto Casadei, PhD

CV (2025–10–15) *Tenure-Track Assistant Professor (RTD-B)*

Overview (highlights)

Current position: Tenure-Track Assistant Professor (RTD-B) 2023/10 → 2026/09 (est.)
Theme Informatics Università di Bologna (IT)

Education: PhD in Computer Science and Engineering 2016/11 → 2020/04
Thesis Engineering Self-* Collective Processes for Cyber-Physical Ecosystems Università di Bologna (IT)

Research record & recent service:

Bibliometrics: 84+ in journals/conf.proceedings; H-index 25 (gscholar), 17 pubs in SCImago Q1 journals
Organisation: ACSOS'24 AEC Chair; DisCoTec'24/23 AEC Chair; ACSOS'22 Proceedings Chair; Senior PC member of ACSOS'23; PC member in 15+ conf. (6 A+ conf.); 5 workshops chaired
Editorial: EB member of JAISCR and Elsevier IoT; Guest Editor in Robotics & AI and SCP

Teaching (recent/highlights). In total 345 hours and 7 different courses, of which:

- Algorithms and Data Structures (44h, B. in Comp. Systems Technologies, UNIBO) a.y. 23-24, 24-25
- Foundations of Informatics (30h, B. in Electrical/Biomedical Engineering), 5 editions (20-21 to 24-25)
- Software Design & Development (30h, B. in Comp. Systems Technologies, UNIBO) a.y. 22-23, 23-24

Supervision/Mentoring

- 2 PhD students (Gianluca Aguzzi, Nicolas Farabegoli), 1 researcher(s), 11 MEng + 10 BEng students

Open-source/academic software projects

Notably SCAFI aggregate programming toolkit (Lead Developer), Alchemist simulator (Contributor)

Research & Education experience abroad (highlights)

2018 TU Wien (Austria) – Visiting PhD student (2 months)
2017 University of St Andrews (Scotland) – Visiting PhD student (3 months)

Awards, qualifications

Awards IEEE TCSC Award for Excellence'24; ECOOP'22 Distinguished Artifact; Prize G. Bassi'17
Qualifications Associate professor 09/H1 & 01/B1 (ASN 21-23); High-school professor A041

Recent Activity

Summary I am currently a tenure-track assistant professor (RTD-B) at the Department of Computer Science & Engineering of the University of Bologna (UNIBO). I got the qualification as associate professor for 09/H1 and 01/B1 (ASN Fascia II) in 2022/23. I have 84+ publications at international journals and conferences; my current H-Index is 25 (GScholar), 20 (SCOPUS). I got a PhD in *CS & Eng.* from UNIBO, with a thesis awarded by the IEEE TCSC. I have been a visiting PhD student as the University of St Andrews (refereed by Prof. Simon Dobson) and at TU Wien (refereed by Prof. Schahram Dustdar). I got awards for research, service, and as a student. I have been teaching 7+ different courses in Computer Science and Engineering Degrees since 2020, for more than 345 hours. I participate(d) to PRIN projects like *Fluidware* and *COMMON-WEARS* (Task Leader), and EU projects like DistriMuSe.

✉ *roby.casadei@unibo.it* • ⌂ *https://robertocasadei.github.io*

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Research Themes in a Nutshell

In a nutshell, my research interests and activity revolve around two main themes: **software engineering** and **distributed artificial intelligence**. In particular, I focus on paradigms, models, and techniques fostering intelligence and autonomy in multi-agent and socio-technical systems. My research applies in the context of IoT-edge-cloud continua, large-scale CPSs, self-* systems, swarm robotics, and collective intelligence.

Qualifications

★ (ASN Fascia II) National Scientific qualification as associate professor in the Italian higher education system (Call 2021/2023, Ministerial Decree n. 553/2021 and 589/2021) for the disciplinary field of 01/B1 - Informatics
I got this qualification by passing a CV evaluation by a committee on the basis of bibliometrics, publications, and qualifications.

2023-02 → 2033-02

★ (ASN Fascia II) National Scientific qualification as associate professor in the Italian higher education system (Call 2021/2023, Ministerial Decree n. 553/2021 and 589/2021) for the disciplinary field of 09/H1 - Information processing systems
I got this qualification by passing a CV evaluation by a committee on the basis of bibliometrics, publications, and qualifications.

2022-02 → 2031-02

Qualification for teaching *Computer Science and Technologies* (c.c. A041) in Italian Secondary School
I got this qualification by passing the ordinary public competition for STEM subjects in 2021 with a score of 192/200 (Rank #1).

2021 →

National Activity

- Substitute Member of the Judging Committee (🆔 *Commissione Giudicatrice*) for the Thesis Defence of Lorenzo Testa, University of Turin, PhD in INFORMATICA (XXXVI cycle)

Participation in University Boards and Committees

- Member of the Board for the Quality Assurance (QA) and Review (🆔 *Riesame*) of the Course Degree (since 2023-10), First Cycle Degree/Bachelor in Computer Systems Technologies (Qualifying Vocational Degree Programme), University of Bologna

- President (since 2024-9) and Member (since 2023-10) of the Board for the Apprenticeships (🆔 *Commissione Tirocini*), First Cycle Degree/Bachelor in Computer Systems Technologies (Qualifying Vocational Degree Programme), University of Bologna

- Member of the Graduation Board (🆔 *Sottocommissione di Laurea*) (2023-07-17, 2022-11-30, 2022-05-25), First Cycle Degree/Bachelor in Computer Science and Engineering, University of Bologna

- Member of the Board for the "Admission to degree years following the first one" (🆔 *Bando per l'ammissione ad anni successivi al primo*) (a.y. 24-25, 23-24), First Cycle Degree/Bachelor in Computer Systems Technologies (Qualifying Vocational Degree Programme), University of Bologna

- Member of the Board for the Selection of a Research Contract (🆔 *Assegno di ricerca*) for project "Study, implementation, and validation of a prototype for an interconnected Digital Platform for remote software update of industrial machines" (🆔 *"Studio, realizzazione, e validazione di un prototipo di Piattaforma Digitale interconnessa per l'aggiornamento del software da remoto per macchine industriali"*)

- Member of the Board for "Ruslan Shaiakhmetov's Annual Report" (2023–2024), PhD Programme in Computer Science and Engineering, University of Bologna

- Member of the Board for the "Extraordinary Selection" (2022-09-19), First Cycle Degree/Bachelor in Computer Systems Technologies (Qualifying Vocational Degree Programme), University of Bologna

- Member of the Board for the "Competition Test for the Admission to the Degree Course" (2022-07-21, 2022-07-19), First Cycle Degree/Bachelor in Computer Systems Technologies (Qualifying Vocational Degree Programme), University of Bologna
- TOLC (Test OnLine CISIA) committee for University Admission (2024-03-28), University of Bologna

Memberships and Participation in Organisations and Societies

★ **IEEE Senior Member** I have been elevated to the IEEE Senior Member grade in July, 2025. IEEE Senior Membership is an honor bestowed only to those who have made significant contributions to the profession. This requires 10 years of professional experience, 5 years of significant performance, and referees by at least 3 IEEE members holding the Fellow, Senior Member, or Honorary Member grade. The evaluation is performed by the IEEE Admission & Advancement Committee.
2025-

IEEE Member
2017-2025

ACM Member
2017-2024

GRIN Società Informatica Italiana - Member
2024–

IEEE Technical Committee on Computational Collective Intelligence - Member
2022–

Invited Seminars and Lectures

- **Invited lecture/seminar**: 2025-04-07 at *Gran Sasso Science Institute*, L'Aquila, Italy. Invited by Dr. Martina de Sanctis and Prof. Patrizio Pelliccione. Audience: PhD students, researchers, professors. Lecture title: *"Software engineering methods for artificial collective intelligence"*.
- **Invited lecture**: 2025-05-05 to 2025-05-09 (5 days) at Kaunas Technical University, Kaunas, Lithuania. Audience: Bachelor's degree students. Topic: software engineering. Lecture topic: decentralised version control with `git`.

Research Community Service and Participation in Committees

Summary

- **editorial board member** of 3 journals, including Elsevier IoT and JAISCR;
- **PC co-chair** for COORDINATION'26, and **Artefact track (co-)chair** for iFM'25, DisCoTec'23-24-25, ACSOS'24;
- PC member of 17 distinct conferences (including AAAI, ECAI, ACSOS), often for multiple editions, and 7 workshops;
- organisational roles in conferences: track chair, publication/proceedings chair, web chair, publicity chair;
- reviewer for 16+ journals and 5+ books.

Membership in Editorial Boards

★ **Elsevier** *Internet of Things – Engineering Cyber Physical Human Systems* **(Q1) - Editorial Board Member**
https://www.sciencedirect.com/journal/internet-of-things/about/editorial-board
I have handled the editorial process for more than 24 submitted manuscripts.
2024–

★ Wiley *Concurrency and Computation: Practice and Experience* (Q2) - Editorial Board Member
2025–
https://onlinelibrary.wiley.com/page/journal/15320634/homepage/editorialboard.html

★ *Journal of Artificial Intelligence and Soft Computing Research* (Q1) - Editorial Board Member
2023–
https://sciendo.com/journal/JAISCR?tab=editorial-board
JAISCR is an international journal, published by Sciendo (De Gruyter Open), publishing research on AI and soft computing.
Metrics: 2021 Journal Impact Factor: 2.675. SCImago Quartile 2022: Q1.

Frontiers in Robotics and AI (Q2) – Multi-Robot Systems section – Review Editor
2023–
https://www.frontiersin.org/journals/robotics-and-ai/editors

━━━━ Guest Editorial Roles

Science of Computer Programming (Q2) - Software Track - Managing Guest Editor - Special Issue "Selected Software Artifacts from the Papers of DisCoTec 2025 - 20th International Federated Conference on Distributed Computing Techniques"
2025–2026
I am the managing guest editor for this Special Issue gathering software artifacts from high-quality submissions at DisCoTec'25. Co-guest editors include Dr. Duncan Paul Attard, Dr. Vinicius Vielmo Cogo, and Dr. Emilio Incerto.
Metrics: SCImago Quartile 2024: Q2.

Science of Computer Programming (Q2) - Software Track - Managing Guest Editor - Special Issue "Selected Software Artifacts from the Papers of DisCoTec 2024 - 19th International Federated Conference on Distributed Computing Techniques"
2024–2025
I am the managing guest editor for this Special Issue gathering software artifacts from high-quality submissions at DisCoTec'24. Co-guest editors include Dr. Duncan Paul Attard, Dr. Rumyana Neykova, and Prof. Joao Soares.
Metrics: SCImago Quartile 2023: Q2.

Science of Computer Programming (Q2) - Software Track - Managing Guest Editor - Special Issue "Selected Software Artifacts from the Papers of DisCoTec 2023 - 18th International Federated Conference on Distributed Computing Techniques"
2023–2024
I am the managing guest editor for this Special Issue gathering software artifacts from high-quality submissions at DisCoTec'23. Co-guest editors include Dr. Vinicius Vielmo Cogo, Dr. Tom van Dijk, and Prof. Alceste Scalas.
Metrics: SCImago Quartile 2023: Q2.

Frontiers in Robotics & AI (Q2) - Guest Associate Editor - Special Issue 2021–2024
"Mobile Cyber-Physical Collectives"
I am guest associate editor for a special issue, also called a research topic, entitled
"Understanding and Engineering Cyber-Physical Collectives". I have prepared,
together with Prof. Lukas Esterle, the special issue proposal, contacted potential
authors, run publicity campaigns, and been handling the review activity for
submitted papers. Co-guest editors include Prof. Lukas Esterle, Prof. Rose
Gamble, Dr. Paul Harvey, and Prof. Elizabeth F. Wanner. The special issue
included 8 articles and 30 authors. The **editorial** is included in the paper section
of this CV.
Metrics: SCImago Quartile 2021-23: Q2.

PC Chairing

COORDINATION'25 Program Committee Co-Chair 2026
28th International Conference on Coordination Models and Languages (part of the Urbino, Italy
21st International Federated Conference on Distributed Computing Techniques,
DisCoTec'26).
The event has been co-chaired with Dr. Fatemeh Ghassemi (University of
Tehran).

Workshop Chairing

DISCOLI'25 Workshop Chair 2025
4th DISCOLI Workshop on DIStributed COLlective Intelligence (co-located with Lucca, Italy
the 21st International Conference on Distributed Computing in Smart Systems
and the Internet of Things, DCOSS-IoT'25).
The event has been co-chaired with Claudio Savaglio (University of Calabria,
IT), Pietro Manzoni (Universitat Politècnica de València, ES), and Alessandro
Sapienza (ISTC-CNR, IT).

ASMECC'23 Workshop Chair 2023
1st ASMECC Workshop on Autonomic and Self-* Management for the Edge- Toronto, Canada
Cloud Continuum (co-located with the 4th IEEE International Conference on
Autonomic Computing and Self-Organizing Systems - ACSOS 2023). The event
has been being co-chaired with Stefano Forti (University of Pisa) and Lukas
Esterle (Aarhus University).

DISCOLI'23 Workshop Chair 2023
2nd DISCOLI Workshop on DIStributed COLlective Intelligence (co-located with Pafos, Cyprus
the 19th International Conference on Distributed Computing in Smart Systems
and the Internet of Things, DCOSS-IoT'23).
As Workshop Chair, I have prepared/submitted the workshop proposal, run
publicity campaigns, selected the program committee, handled the peer review
process, took the decisions regarding the final program, and chaired the workshop
event. The event has been co-chaired with Noel Crespi (Institut Polytechnique
de Paris), Claudio Savaglio (University of Calabria), and Christos Tsigkanos
(University of Athens).

DISCOLI'22 Workshop Chair 2022
1st DISCOLI Workshop on DIStributed COLlective Intelligence (co-located with Bologna, Italy
the 42nd IEEE International Conference on Distributed Computing Systems,
ICDCS'22).
As Workshop Chair, I have prepared/submitted the workshop proposal, run
publicity campaigns, selected the program committee, handled the peer review
process, took the decisions regarding the final program, and chaired the workshop
event. The event has been co-chaired with Min Chen (Huazhong University of
Science and Technology), Franco Zambonelli (University of Modena and Reggio
Emilia), and Mengchu Zhou (New Jersey Institute of Technology).

eCAS'21 Workshop Chair 2021
6th eCAS Workshop on Engineering Collective Adaptive Systems (co-located Washington DC, USA
with ACSOS'21)
As Workshop Chair, I prepared/submitted the workshop proposal, run publicity
campaigns, selected the program committee, handled the peer review process,
and planned/run the workshop day. The event has been co-chaired with Lukas
Esterle (Aarhus University).

eCAS'19 Workshop Chair 2019
4th eCAS Workshop on Engineering Collective Adaptive Systems (co-located Ulmea, Sweden
with SASO'19)
As Workshop Chair, I prepared/submitted the workshop proposal, run publicity
campaigns, selected the program committee, handled the peer review process,
and planned/run the workshop day. The event has been co-chaired with Soura
Dasgupta (University of Iowa).

━━━ Session chairing

○ PPDP'24, Session 3

○ ACSOS'21, Session "Languages, formal methods, and assurances for Autonomic and Self-Organizing
  Systems"

━━━ Participation in organising committees

★ ACSOS'26 Finance Chair 2025-26
7th IEEE International Conference on Autonomic Computing and Self-Organizing Cesena, Italy
Systems

★ iFM'25 Artifact Evaluation Chair 2025
20th International Conference on Integrated Formal Methods Paris, France

★ DisCoTec'25 Artifact Evaluation Chair 2025
20th International Federated Conference on Distributed Computing Techniques Lille, France

★ ACSOS'24 Artifact Evaluation Chair 2023–24
5th IEEE International Conference on Autonomic Computing and Self-Organizing Aarhus, Denmark
Systems

★ DisCoTec'24 Artifact Evaluation Chair 2024
19th International Federated Conference on Distributed Computing Techniques. Groningen, Netherlands
Ditto.

CyberSciTech'23 Track Chair 2023
8th IEEE Cyber Science and Technology Congress Abu Dhabi, UAE

★ DisCoTec'23 Artifact Evaluation Chair   2023
18th International Federated Conference on Distributed Computing Techniques.   Lisbon, Portugal
Ditto.

CyberSciTech'22 Track 3 "Cyber Physical Computing & Systems" Chair   2022
7th IEEE Cyber Science and Technology Congress   Calabria, Italy
I co-chair the Track on "Cyber Physical Computing & Systems".

★ ACSOS'22 Publication/Proceedings Chair   2021
3rd IEEE International Conference on Autonomic Computing and Self-Organizing   Washington DC, USA
Systems

eCAS'22 Web Chair   2022
7th eCAS Workshop on Engineering Collective Adaptive Systems   Virtual

ACSOS'21 Publicity Chair   2021
2nd IEEE International Conference on Autonomic Computing and Self-Organizing   Washington DC, USA
Systems

SASO'18 Web Chair   2018
12th IEEE International Conference on Self-Adaptive and Self-Organizing Sys-   Trento, Italy
tems

────── Participation in program committees

Conferences:

1. **ACSOS** – IEEE International Conference on Autonomic Computing and Self-Organizing Systems
   (2025 [Posters & Demos], 2024, 2023 [Senior PC], 2022, 2021 editions)

2. **SEAMS** – International Conference on Software Engineering for Adaptive and Self-Managing Systems
   (2026 edition)

3. **AAAI** – Annual AAAI Conference on Artificial Intelligence   [ICORE'23: A*]
   (2026, 2025, 2024, 2023 editions)

4. **ASE** – IEEE/ACM International Conference on Automated Software Engineering – New Ideas and
   Emerging Results (NIER) track [ICORE'23: A*]
   (2024 edition)

5. **ECAI** – European Conference on Artificial Intelligence   [ICORE'23: A]
   (2025, 2024 edition)

6. **ALIFE** – International Conference on Artificial Life   [ICORE'23: C]
   (2025 edition)

7. **ECOOP/ISSTA** – European Conference on Object-Oriented Programming (ECOOP) / International
   Symposium on Software Testing and Analysis (ISSTA 2023) – ACM Student Research Competition (SRC)
   [ICORE'23: A]
   (2023 edition)

8. **MODELS** – ACM/IEEE International Conference on Model Driven Engineering Languages and Systems
   – ACM Student Research Competition (SRC) [ICORE'23: A]
   (2021 edition)

9. **PLDI** – ACM SIGPLAN Conference on Programming Language Design and Implementation – Artefacts
   track [ICORE'23: A*]
   (2021 edition)

10. **SAC** – ACM Symposium on Applied Computing – IRMAS "Intelligent Robotics and Multi-Agent Systems" track [ICORE'23: B]
(2026, 2025, 2024, 2023 editions)

11. **ICCCI** – International Conference on Computational Collective Intelligence [ICORE'23: B]
(2024, 2023 editions)

12. **CCNC** – IEEE Consumer Communications & Networking Conference [ICORE'23: B]
(2024 edition)

13. **COORDINATION** – International Conference on Coordination Models and Languages [ICORE'23: C]
(2022, 2021 editions)

14. **QUATIC** – International Conference on the Quality of Information and Communication Technology – "Evolution and Maintenance" (2025) and "Quality in Adaptive Software" (2024) Tracks [ICORE'23: C]
(2025, 2024 editions)

15. **PPDP** – International Symposium on Principles and Practice of Declarative Programming [ICORE'23: C]
(2024 edition)

16. **DCOSS-IoT** – International Conference on Distributed Computing in Smart Systems and the Internet of Things [ICORE'23: B]
(2025 edition)

17. **CNA** – International Conference on Complex Networks and their Applications
(2025, 2024 editions)

18. **PDP** – Euromicro International Conference on Parallel, Distributed, and Network-Based Processing [ICORE'23: C]
(2025 edition)

19. **I3E** – IFIP Conference on e-Business, e-Services, and e-Society
(2025, 2024 editions)

20. **CyberSciTech** – IEEE Cyber Science and Technology Congress
(2023, 2022 editions)

Workshops

1. **DAT** – International Workshop on Digital Twin-enabled Autonomous Systems and Agents
(https://dat-workshop.github.io/ edition)

2. **AHPC3** – International Workshop on Accelerated HPC in the Cloud-Edge Continuum
(2025 (2nd), 2025 (1st) editions)

3. **SMvg** – International Workshop on Smart Moving
(2024 edition)

4. **SISSY** – International Workshop on Self-Improving System Integration
(2025, 2024 editions)

5. **DISCOLI** – International Workshop on DIStributed COLlective Intelligence
(2024, 2023, 2022 editions)

6. **WOA** – International Workshop "From Objects to Agents"
(2024, 2023, 2022, 2021 editions)

7. **eCAS** – International Workshop on Engineering Collective Adaptive Systems
(2022, 2020, 2017 editions)

8. **ALPACA** – International Workshop on Adaptive, Learning PervAsive Applications
(2021 edition)

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Peer review activity in international journals

○ **Excellent reviewer** according to my Web of Science™ profile (according to the feedback provided by associate editors)

○ 20+ verified reviews on my Web of Science™ profile

○ ACM Transactions on Autonomous and Adaptive Systems ○ IEEE Transactions on Intelligent Transportation Systems ○ IEEE Internet of Things ○ IEEE Transactions on Services Computing ○ Elsevier Engineering Applications of Artificial Intelligence ○ Elsevier Pervasive and Mobile Computing ○ Elsevier Systems and Software ○ Elsevier Science of Computer Programming ○ Hindawi Scientific Programming ○ MDPI Robotics ○ MDPI Sensors ○ MDPI Applied Sciences ○ MDPI Informatics ○ IOS Press Intelligenza Artificiale ○ Springer Software and Systems Modeling ○ Springer Autonomous Agents and Multi-Agent Systems ○ World Scientific International Journal of Information Technology & Decision Making

Other review activity (books)

I am in the reviewer pool of *Manning Publications*, a well-known publisher of books on computer technology topics. The evidence of this activity lies in the "Acknowledgments" sections of the books that I reviewed. These include:

1. Functional Design and Architecture (Alexander Granin, 2024, Manning)

2. Software Mistakes and Tradeoffs: How to make good programming decisions (Tomasz Lelek and Jon Skeet, 2022, Manning)

3. Quantum Computing in Action (Johan Vos, 2022, Manning)

4. Programming with Types (Vlad Riscutia, 2019, Manning)

5. Classic Computer Science Problems in Python (David Kopec, 2019, Manning)

Talks at Conferences and Events

Presentations of peer-reviewed papers

Integrating Collective Computing and the Social Internet of Things for Smart Cities: A Vision

2024/09

Lucca, IT

Event   4th DISCOLI Workshop on DIStributed COLlective Intelligence (DISCOLI 2025), co-located with DCOSS-IoT'25

Declarative Macro-Programming of Collective Systems with Aggregate Computing: An Experience Report

2024/09

Milan, IT

Event   26th International Symposium on Principles and Practice of Declarative Programming, co-located with FM'24

Software Engineering for Collective Cyber-Physical Ecosystems

2024/07

Porto de Galinhas, BR

Event   International Workshop on Software Engineering in 2030, co-located with FSE'24

Modelling Groups of Humans: Towards Crowd Digital Twins

2024/06

Paris, FR

Event   5th IEEE International Workshop on Social (Media) Sensing (SMS-24), co-located with IEEE ISCC'24

Self-Organisation Programming: a Functional Reactive Macro Approach

2023/09

Toronto, CA

Event   4th IEEE International Conference on Autonomic Computing and Self-Organizing Systems (ACSOS 2023)

[Tutorial] Programming (and Learning) Self-Adaptive & Self-Organising Behaviour with ScaFi: for Swarms, Edge-Cloud Ecosystems, and More
2023/09
Toronto, CA
Event   4th IEEE International Conference on Autonomic Computing and Self-Organizing Systems (ACSOS 2023)

Programming Distributed Collective Processes for Dynamic Ensembles and Collective Tasks
2023/06
Lisbon, PT
Event   25th International Conference on Coordination Models and Languages (COORDINATION 2023)

Towards Automated Engineering for Collective Adaptive Systems: Vision and Research Directions
2022/09
Falerna, ITA
Event   1st International Workshop on COMMunity-OrieNted WEARrable Computing Systems (COMMON-WEARS 2022)

FScaFi: A Core Calculus for Collective Adaptive Systems Programming
2021/10
Rhodes, GRC
Event   10th International Symposium On Leveraging Applications of Formal Methods, Verification and Validation

Augmented Collective Digital Twins for Self-Organising Cyber-Physical Systems
2021/10
Online
Event   SISSY Workshop on Self-Improving System Integration

Tuple-Based Coordination in Large-Scale Situated Systems
2021/06
Online
Event   23rd International Conference on Coordination Models and Languages

Collective Adaptive Systems as Coordination Media: The Case of Tuples in Space-Time
2020/08
Online
Event   5th eCAS Workshop on Engineering Collective Adaptive Systems

Engineering Resilient Collaborative Edge-enabled IoT
2019/07
Milan, ITA
Event   16th IEEE International Conference on Services Computing

Aggregate Processes in Field Calculus
2019/06
Copenaghen, DNK
Event   21th International Conference on Coordination Models and Languages

On Context-Orientation in Aggregate Programming
2019/06
Umeå, SWE
Event   4th eCAS Workshop on Engineering Collective Adaptive Systems

Coordinating Computation at the Edge: a Decentralized, Self-Organizing, Spatial Approach
2019/06
Rome, ITA
Event   4th IEEE International Conference on Fog and Mobile Edge Computing

Collective Abtractions & Platforms for Large-Scale Self-Adaptive IoT
2018/09
Trento, ITA
Event   3rd eCAS Workshop on Engineering Collective Adaptive Systems

From Field-Based Coordination to Aggregate Computing
2018/06
Madrid, ESP
Event   20th International Conference on Coordination Models and Languages

Compositional Blocks for Optimal Self-Healing Gradients
2017/09
Tucson, AZ, USA
Event   11th IEEE International Conference on Self-Adaptive and Self-Organizing Systems (SASO'17)

Practical Aggregate Programming in Scala
2016/10
Amsterdam, NLD
Event   Scala Symposium 2016

Programming Actor-based Collective Adaptive Systems
Event AGERE'16 (international workshop on agents and actors)

2016/10
Amsterdam, NLD

On Execution Platforms for Large-Scale Aggregate Computing
Event Workshop on Collective Adaptation in Very Large Scale Ubicomp: Towards a Superorganism of Wearables, Ubicomp/ISWC Adjunct

2016/09
Heidelberg, DEU

Towards Aggregate Programming in Scala
Event 1st International Workshop on Programming Models and Languages for Distributed Computing (PMLDC) – co-located with ECOOP

2016/06
Rome, ITA

—— Other talks

Introduction to the 1st DISCOLI workshop on distributed collective intelligence
Event 1st DISCOLI Workshop on DIStributed COLlective Intelligence

2022/06
Bologna, IT

6th eCAS Workshop on Engineering Collective Adaptive Systems: Introduction to the workshop
Event 6th eCAS Workshop on Engineering Collective Adaptive Systems

2021/10
Online

—— Collaborations with Research Groups

- Participation in the research activity of the research group coordinated by **Prof. Mirko Viroli (University of Bologna, Italy)**. This is the research group with which Roberto has collaborated mostly in his career and that led to more than 60 publications in international journals and conference proceedings. (2016→)

- Collaboration with the research group coordinated by **Prof. Ferruccio Damiani (University of Turin, Italy)** on themes related to field-based coordination and distributed computation. Output of this collaboration includes 20 co-authored publication (of which 8 articles on international journals). (2016→)

- Collaboration with the research group coordinated by **Prof. Giancarlo Fortino (University of Calabria, Italy)**, on themes revolving around the software engineering of opportunistic services in the Internet of Things and edge computing. Output of this collaboration includes 5 co-authored publications (of which 3 articles published on international journals). The collaboration was also in the context of the Fluidware project and COMMON-WEARS project. (2019→)

- Collaboration with **Danny Weyns (Katholieke Universiteit Leuven, Belgium)** on self-adaptive software architectures. Output of this collaboration includes 4 co-authored publications (of which 2 articles on international journals). (2020→)

- Collaboration with the research group coordinated by **Prof. Franco Zambonelli (University of Modena e Reggio Emilia, Italy; IEEE Fellow, ACM Distinguished Scientist)**, especially in the context of Fluidware project. Output of this collaboration includes 6 co-authored publications (of which 2 articles on international journals). (2019→)

- Collaboration with **Prof. Lukas Esterle (University di Aarhus, Danimarca)**, on themes related to collective adaptive systems. Output of this collaboration includes one paper published in an international journal (ACM TAAS). We have also co-chaired the eCAS'21 workshop and co-edited one special issue. (2020→)

- Collaboration with **Prof. Alessandro Ricci (University di Bologna, Italy)**, on themes related to coordination and multi-agent systems. Output of this collaboration includes two papers published in the proceedings of international conferences. (2020→)

- Collaboration with **Prof. Guido Salvaneschi (University of St.Gallen)** on programming languages for distributed computing. Output of this collaboration includes 4 co-authored publications (of which 1 article published on an international journals). (2019→)

- Collaboration with **Prof. Volker Stolz (University of Oslo)** on themes related to distributed runtime verification and monitoring. Output of this collaboration includes 1 article published on an international journal. (2020→2021)

- Collaboration with **Prof. Simon Dobson (University of St Andrews)**, on themes related to sensor systems and complex networks. The collaboration included a 3-month visit period at the University of St Andrews. Output of this collaboration includes 1 article accepted on an international IEEE magazine. (2017→2020)

- Collaboration with the research group coordinated by **Prof. Schahram Dustdar (TU Wien, Austria; IEEE Fellow, ACM Distinguished Scientist)**, on themes related to the engineering of resilient, collaborative, Internet of Things systems. This collaboration started with my 2-month visit at TU Wien (Austria). Output of this collaboration includes 1 paper published in the proceedings of an international conference. (2018)

- Collaboration with **Prof. Antonio Bucchiarone (Fondazione Bruno Kessler, Trento, Italy)** on themes related to collective adaptive systems. Output of this collaboration includes 1 article accepted on an international IEEE magazine. (2019)

- Collaboration with **Prof. Alessandro Aldini (University of Urbino Carlo Bo', Italy)**, on the intersection of computational trust techniques and collective adaptive systems. Output of this collaboration includes 1 article published on an international journal and 1 paper in the proceedings of an international conference. (2017→2018).

- Collaboration with **Dr. Jacob Beal (Raytheon BBN Technologies, USA)** on aggregate computing. Output of this collaboration includes 1 article accepted on an international journal and 1 paper published in the proceedings of an international conference. (2018→2019)

- Collaboration with the research group coordinated by **Prof. Andrea Omicini (University of Bologna, Italy)**, on themes related to the engineering of multi-agent systems. Output of this collaboration includes 1 paper published in the proceedings of an international conference. (2018)

Participation in Funded Research Projects

Roles

- **Task Leader** for Task 1.2 "Collective Opportunistic Computing Model" within Work Package 1 "Model" in the PRIN Project "COMMON-WEARS" (2020HCWWLP).

Participation

- Participation as scientific collaborator in the EU-funded project **DistriMuSe – Distributed Multi-sensor Systems for Human Health and Safety** (HORIZON-KDT-JU-2023-2-RIA | 2023-2026). This project has received funding from the KDT Joint Undertaking, European Commission (grant agreement 101139769).

- Fixed-Term Researcher (RTD-A) in **Programma Operativo Nazionale (PON) "Research & Innovation" 2014-2020 – RTDA_GREEN project (CUP J41B21012140007)**.

- Participation as scientific collaborator in **PRIN Italian Project COMMunity-OrieNted WEARrable Computing Systems (COMMON-WEARS, no. 2020HCWWLP)**, coordinated by Prof. Giancarlo Fortino and involving a consortium of four universities: University of Calabria, University of Bologna, University of Turin, and Rome Biomedical Campus University. I have participated to all the project meetings, including the COMMON-WEARS Workshop at the 7th IEEE Cyber Science and Technology Congress. I have (co-)authored 2+ articles acknowledging the COMMON-WEARS project. See the COMMON-WEARS website for information about the consortium, participants, and publications. (2022→)

- Participation as scientific collaborator in **PRIN Italian Project Fluidware (2017KRC7KT)**, coordinated by Prof. Franco Zambonelli and involving a consortium of four universities: University of Modena and Reggio Emilia, University of Bologna, University of Camerino, and University of Calabria. The project

revolves around models and techniques for adaptive distributed computing. I have participated to all the project meetings, and given various talks (such as #1, #2). In particular, this collaboration activity led to two articles published in international journals and one paper on the proceedings of international conferences. In total, I have (co-)authored 8 articles acknowledging the FluidWare project. See the FluidWare website for information about the consortium, participants, and publications. (2019→2023)

Research for Public and Private Institutions

Research in Academia

- **Fixed-Term Senior Researcher (RTD-B)** on project "Informatics" (Department of Computer Science and Engineering, Alma Mater Studiorum - Università di Bologna, Italy). (2023-10→ est. 2026-09)

- **Fixed-Term Junior Researcher (RTD-A)** on project "Techniques & strategies for Green Autonomic Internet of Things (GA-IoT)" (Department of Computer Science and Engineering, Alma Mater Studiorum - Università di Bologna, Italy), supervised by Prof. Mirko Viroli. (2022-02→2023-10)

- **Research fellowship (Assegno di Ricerca)** on project "Engineering evolving collective adaptive systems for smart infrastructures" (Department of Computer Science and Engineering, Alma Mater Studiorum - Università di Bologna, Italy), supervised by Prof. Mirko Viroli. (2021→2022)

- **Research fellowship (Assegno di Ricerca)** on project "Engineering evolving collective adaptive systems for modern infrastructures" (Department of Computer Science and Engineering, Alma Mater Studiorum - Università di Bologna, Italy), supervised by Prof. Mirko Viroli. (2020→2021)

- **Research fellowship (Assegno di Ricerca)** on project "Engineering collective adaptive processes through aggregate computing" (Department of Computer Science and Engineering, Alma Mater Studiorum - Università di Bologna, Italy), supervised by Prof. Mirko Viroli. (2019→2020)

Participation in Projects with Companies

- Participation as scientific collaborator in project on "cybersecurity and threat attribution" by YOROI S.R.L. and University of Bologna. (2021→2022)

- Participation as scientific collaborator in project "Realizzazione di un Compilatore da specifica di alto livello a comandi PLC per macchine monolama per la lavorazione del legno" by the University of Bologna and SCM Group S.p.A. (2020→2021)

- Participation as scientific collaborator in project "Realizzazione tramite Model Driven Engineering di un sistema di reporting moderno per l'ERP Star4" by the University of Bologna and Formula Impresoft S.R.L. (2020→2021)

- Participation as scientific collaborator in project PG/2016/667492 "Re-ingegnerizzazione da Cobol a .NET di una piattaforma gestionale intersettoriale" by University of Bologna and Harvard Group (now Impresoft S.R.L.). (2017→2018)

- Research activity "Software infrastructures for the management of IoT systems" on scholarship issued by the Department of Computer Science and Engineering (Alma Mater Studiorum - Università di Bologna), on funds by Centro Studi - Orizzonti Holding. The research focussed on technologies for IoT, process mining, and microservices, and their application to large-scale and small-scale retail. (2016→2017)

Experiences Abroad

Visiting PhD student @ Technische Universität Wien (Austria) 2018, 2 months
Collaboration with the research group coordinated by *Prof. Schahram Dustdar (TU Wien, Austria; IEEE Fellow, ACM Distinguished Scientist)*, on themes related to the engineering of resilient, collaborative, Internet of Things systems. This collaboration started with my 2-month visit at TU Wien (Austria). Output of this collaboration includes one paper published in the proceedings of an international conference.

Visiting PhD student @ University of St Andrews (Scotland) 2017, 3 months
Collaboration with *Prof. Simon Dobson (University of St Andews)*, on themes Marco Polo scholarship
related to collective adaptive systems. Output of this collaboration includes one article accepted on an international IEEE magazine.

Erasmus @ University of Limerick (Ireland) 2012, 4 months
Taking exams on specific BEng courses (see Education section). Erasmus scholarship

Scholarships and Grants

Computer Science and Engineering PhD Scholarship 2016/11 → 2019/10
This scholarship, granted by the Italian Ministry of Education, Universities, and Università di Bologna (IT)
Research (MIUR), covered all the 3 years of my PhD in Computer Science and Engineering at Alma Mater Studiorum–Università di Bologna (Italy). I got this scholarship by winning the corresponding public competition based on qualifications and interview.

Travel/Conference Grant – DisCoTec 2019 2019
Issuer   Denmarks Tekniske Universitet (DTU)
This selective grant covered my participation to the COORDINATION 2019 conference in Copenhagen, Denmark.

Mobility Grant – Marco Polo 2016 2017
Issuer   Department of Computer Science and Engineering (DISI), UNIBO
This selective grant covered my 3-months PhD abroad period in St Andrews, Scotland.

Travel/Conference Grant – Scala Symposium 2016 2016
Issuer   École polytechnique fédérale de Lausanne (EPFL)
Grant issued by École polytechnique fédérale de Lausanne (EPFL) for presentation at the Scala Symposium 2016, co-located with the SPLASH'16 conference.

Study Scholarship (Borsa di Studio) 2016/09 → 2016/11
Issuer   Department of Computer Science and Engineering (DISI), UNIBO University of Bologna
Financ.   Centro Studi - Orizzonti Holding SPA
Theme   Software Infrastructures for the Management of IoT Systems
This scholarship supported a study of proof-of-concept IoT solutions for the retail market. In this context, I got familiarity with microservices, Docker, and process mining. I renounced to the scholarship once I got formally admitted to the PhD Programme, for incompatibility of the scholarships.

Awards

Research Awards

★ IEEE TCSC Award for Excellence 2024

2024/12

I was selected as winner for the Award for Excellence 2024 by the IEEE Technical Committee on Scalable Computing. The selection committee for the 2024 edition of the award was formed by Prof. Jinjun Chen (chair), Prof. Bernady O. Apduhan, Prof. Laurence T. Yang, Prof. Beniamino di Martino, and Dr. Eng. Didier El Baz.

*"The IEEE TCSC (Technical Committee on Scalable Computing) Award for Excellence in Scalable Computing (Early Career Researchers) recognizes up to 5 individuals who have made **outstanding, influential, and potentially long-lasting contributions in the field of scalable computing**. Typically the candidates are within 5 years of receiving their PhD degree as of January 01 of the year of the award."*

The motivation of the award mentions: ***"for contributions to computational and programming paradigms supporting the engineering of large-scale collective and self-organizing systems"***.

★ ECOOP 2022 Distinguished Artifact Award

2022
Berlin (Germany)

Our artifact, associated to paper "Functional Programming for Distributed Systems with XC" and submitted to the Artifacts track of the 36th European Conference on Object-Oriented Programming (ECOOP 2022), has been awarded with the "Distinguished Artifact" award by the ECOOP'22 Artifact Evaluation Committee. Three artifacts were distinguished among a total of 53 artifacts accepted at ECOOP'22.

★ IEEE TCSC Outstanding PhD Dissertation Award 2020

2020

I was selected as winner for an international PhD thesis award promoted by the IEEE Technical Committee on Scalable Computing. The selection committee for the 2020 edition of the award was formed by Prof. Hai Jiang (chair), Prof. Bernady O. Apduhan, Prof. Beniamino di Martino, and Dr. Eng. Didier El Baz.

*"The IEEE TCSC Outstanding PhD Dissertation Award is an annual award to recognize candidates that have recently received a PhD degree for no more than 2 years and have written an **outstanding PhD dissertation in the field of the scalable computing** with applications. This award is established to encourage doctoral research that combines theory and practice or makes in-depth technical contributions, having the potential to contribute to the IEEE TCSC."*

Academic Service Awards

ACSOS'24 Certificate of Appreciation as "Artifact Evaluation Chair"

2024

I was given this certificate of appreciation by by the General Chairs, Lukas Esterle and Alessandro V. Papadopoulos, and the PC Chairs, Payam Zahadat and Christian Becker, for my service as **Artifact Evaluation Chair** for the 5th IEEE International Conference on Autonomic Computing and Self-Organizing Systems (ACSOS 2024).

ACSOS'22 Outstanding Service Award

2022

I was presented with the *Outstanding Service Award*, by the General Chairs Sven Tomforde and Kirstie Bellman, for having served as **Proceedings Chair** for the 3rd IEEE International Conference on Autonomic Computing and Self-Organizing Systems (ACSOS 2022).

ACSOS'21 Outstanding Service Award 2021

I was presented with the *Outstanding Service Award*, by the General Chairs Jean Botev, Tarek El-Ghazawi, and Christopher Stewart, for having served as **Publicity Chair** for the 2nd IEEE International Conference on Autonomic Computing and Self-Organizing Systems (ACSOS 2021).

Student Awards

Best District-2072 MEng graduate student (G.Bassi 2017 prize) 2017
Faenza (Italy)

I was selected as winner of prize *Gianni Bassi*, with 5000€ scholarship, issued by Rotary Club Faenza for *Best Master Graduate Student* across all Engineering faculties of Romagna (district 2072) based on Grade Average and number of laudes.

Prize for meritorious students (UNIBO) a.y. 2014-15
Università di Bologna (IT)

I was selected among the ex-aequo winners of the public competition for meritorious students of the University of Bologna in academic year 2014/2015 (section common to all Engineering and Architecture faculties), granting a scholarship.

High school graduation award 2009
Cesena (Italy)

I was given the "Roberto Ruffilli" acknowledgment for high-school graduation with score 100/100 (cum laude).

Selected Publications

A selection of 15 significant publications follows.

1. **R. Casadei**. "System-Wide IoT design and programming: Patterns for decentralised collective processes". In: *Internet of Things* (2024), p. 101436. DOI: [10.1016/j.iot.2024.101436](10.1016/j.iot.2024.101436)

   - **Metrics:** Q1 (SCImago).

   - **Short summary:** In this work, I present a new design/programming pattern catalogue for collective computational processes. I propose a pattern catalogue distinguishing 5 Lifecycle patterns (Event-based triggering, Prolonged termination, Explicit collective termination, Spatial replication, Time replication), 2 Behaviour patterns (Leader-based and State-based Collective Behaviour), and 3 Mobility patterns (Node-attached, Space-attached, and Moving process.

2. **R. Casadei**, G. Aguzzi, G. Audrito, F. Damiani, D. Pianini, G. Scarso, G. Torta, and M. Viroli. "Software Engineering for Collective Cyber-Physical Ecosystems". In: *ACM Transactions on Software Engineering and Methodology* (2025). DOI: [10.1145/3712004](10.1145/3712004)

   - **Metrics:** Q1 (SCImago).

   - **Short summary:** In this work, we provide a structure for research on collective cyber-physical ecosystems, and define a roadmap based on current software engineering challenges for such systems.

3. N. Farabegoli, D. Pianini, **R. Casadei**, and M. Viroli. "Dynamic IoT deployment reconfiguration: A global-level self-organisation approach". In: *Internet of Things* 28 (Dec. 2024), p. 101412. ISSN: 2542-6605. DOI: [10.1016/j.iot.2024.101412](10.1016/j.iot.2024.101412)

   - **Metrics:** Q1 (SCImago).

   - **Short summary:** In this work, we investigate how "programs" expressing self-organisation logic by a global perspective can help to support the dynamic reconfiguration of IoT deployments. The contributions include a middleware for management of pulverised systems across the edge-cloud continuum examples of reconfiguring aggregate computations.

4. N. Farabegoli, D. Pianini, **R. Casadei**, and M. Viroli. "Scalability through Pulverisation: Declarative deployment reconfiguration at runtime". In: *Future Generation Computer Systems* 161 (Dec. 2024), 545–558. ISSN: 0167-739X. DOI: 10.1016/j.future.2024.07.042

   ○ **Metrics:** Q1 (SCImago).

   ○ **Short summary:** This work presents a framework for the reconfiguration of pulverised systems, a middleware architecture, and a practical implementation based on Kotlin-based DSLs (system DSL and deployment DSL).

5. G. Audrito, **R. Casadei**, F. Damiani, G. Salvaneschi, and M. Viroli. "The eXchange Calculus (XC): A functional programming language design for distributed collective systems". In: *Journal of Systems and Software* (2024), p. 111976. ISSN: 0164-1212. DOI: https://doi.org/10.1016/j.jss.2024.111976

   ○ **Metrics:** Q1 (SCImago).

   ○ **Short summary:** In this work, we present the eXchange Calculus (XC), a more general variant of the field calculus supporting differentiated messages and describe its support for distributed programming of resilient systems, with a narrative tailored to the programming language community.

6. **R. Casadei**. "Macroprogramming: Concepts, State of the Art, and Opportunities of Macroscopic Behaviour Modelling". In: *ACM Comput. Surv.* 55.13s (2023), pp. 1–37. ISSN: 0360-0300. DOI: 10.1145/3579353

   ○ **Metrics:** Q1 (SCImago). 16 (IF).

   ○ **Short summary:** This work provides the first comprehensive view of macroprogramming research. It is a long survey that provides a mapping study, a discussion of the key concepts and principles of the paradigm, a taxonomy of macroprogramming approaches, an analysis of more than 50 primary works on macroprogramming, and a discussion of related research opportunities and challenges.

7. G. Audrito, **R. Casadei**, and G. Torta. "A general framework and decentralised algorithms for collective computational processes". In: *Future Generation Computer Systems* 158 (2024), pp. 11–27. ISSN: 0167-739X. DOI: 10.1016/j.future.2024.04.020

   ○ **Corresponding author**
   ○ **Metrics:** Q1 (SCImago). 7 (IF).

   ○ **Short summary:** This work provides a formalisation of collective/self-organising processes on event structures, with guarantees on their evolution dynamics. The approach is valided on a case study of peer-to-peer service discovery and access.

8. D. Pianini, F. Pettinari, **R. Casadei**, and L. Esterle. "A Collective Adaptive Approach to Decentralised k-Coverage in Multi-robot Systems". In: *ACM Trans. Auton. Adapt. Syst.* 17 (2022), 4:1–4:39. DOI: 10.1145/3547145

   ○ **Metrics:** Q2 (SCImago). 2.7 (IF).

   ○ **Short summary:** This work addresses the online multi-object k-coverage problem (OMOkC) problem through a collective adaptive systems approach, and accordingly provides novel algorithms improving over state-of-the-art solutions as well as a toolchain and simulation for experimenting with mobile robots with field of view.

9. **R. Casadei**, G. Fortino, D. Pianini, A. Placuzzi, C. Savaglio, and M. Viroli. "A Methodology and Simulation-Based Toolchain for Estimating Deployment Performance of Smart Collective Services at the Edge". In: *IEEE Internet of Things Journal* 9.20 (2022), pp. 20136–20148. DOI: 10.1109/JIOT.2022.3172470

   ○ **Metrics:** Q1 (SCImago). 10.6 (IF).

   ○ **Short summary:** In this work, we present a methodology and toolchain for evaluating deployments of self-organizing systems developed through aggregate computing, across the IoT-fog-cloud continuum.

10. G. Audrito, **R. Casadei**, F. Damiani, V. Stolz, and M. Viroli. "Adaptive distributed monitors of spatial properties for cyber-physical systems". In: *Journal of Systems and Software* 175 (2021), p. 110908. DOI: 10.1016/j.jss.2021.110908

    ○ **Metrics:** Q1 (SCImago). 3.514 (IF).

    ○ **Short summary:** In this work, we propose a compositional mapping of Spatial Logic for Closure Spaces (SLCS) constructs to field calculus constructs, enabling the direct encoding of SLCS formulas as decentralised monitors for runtime verification of spatial properties. We formally prove the generated monitors are correct and optimally self-stabilising, and validate the response to variable dynamics by means of simulations of crowd monitoring/control scenarios.

11. **R. Casadei**, M. Viroli, G. Audrito, D. Pianini, and F. Damiani. "Engineering collective intelligence at the edge with aggregate processes". In: *Engineering Applications of Artificial Intelligence* 97 (2021), p. 104081. ISSN: 0952-1976. DOI: 10.1016/j.engappai.2020.104081

    ○ **Metrics:** Q1 (SCImago). 7.802 (IF).

    ○ **Short summary:** Aggregate processes are a programming abstraction, introduced as an extension to the field calculus and implemented in the ScaFi aggregate programming DSL, that captures *concurrent dynamic collective computations*. Its versatility in supporting collective intelligence and self-organisation is shown through simulations of IoT/edge computing scenarios.

12. G. Audrito, **R. Casadei**, F. Damiani, D. Pianini, and M. Viroli. "Optimal resilient distributed data collection in mobile edge environments". In: *Computers & Electrical Engineering* (2021), p. 107580. ISSN: 0045-7906. DOI: 10.1016/j.compeleceng.2021.107580

    ○ **Metrics:** Q1 (SCImago). 4.152 (IF).

    ○ **Short summary:** New algorithms for dynamic spatial data collection/summarisation are introduced, supporting better reactivity and resilience in highly-variable scenarios than state-of-the-art algorithms. Results are validated through controlled experiments and a simulated case study in edge data mining.

13. D. Pianini, **R. Casadei**, M. Viroli, and A. Natali. "Partitioned integration and coordination via the self-organising coordination regions pattern". In: *Future Generation Computer Systems* 114 (Jan. 2021), pp. 44–68. DOI: 10.1016/j.future.2020.07.032

    ○ **Corresponding author**

    ○ **Metrics:** Q1 (SCImago). 7.307 (IF).

    ○ **Short summary:** This work presents a very general design pattern for decentralised feedback-regulated self-integration in dynamic environments. The *Self-organising Coordination Regions (SCR)* pattern consists of a dynamic distributed process involving leader election, coalition formation, and feedback loops between leaders and subordinates. The paper shows SCR has many known uses in literature and enjoys great versatility, shown via case studies in edge computing and hierarchical networks.

14. **R. Casadei**, G. Fortino, D. Pianini, W. Russo, C. Savaglio, and M. Viroli. "A development approach for collective opportunistic Edge-of-Things services". In: *Information Sciences* 498 (2019), pp. 154–169. DOI: 10.1016/j.ins.2019.05.058

    ○ **Metrics:** Q1 (SCImago). 5.910 (IF).

    ○ **Short summary:** This work describes an approach to opportunistic edge computing that leverages collective-based services. In particular, it proposes a *Collective IoT Service* design abstraction. Experimental evaluation is performed through a crowd management case study, comparing Edge vs. Cloud deployments w.r.t. reactivity and precision.

15. **R. Casadei**, G. Fortino, D. Pianini, W. Russo, C. Savaglio, and M. Viroli. "Modelling and simulation of Opportunistic IoT Services with Aggregate Computing". In: *Future Generation Computer Systems* 91 (2018), pp. 252–262. DOI: 10.1016/j.future.2018.09.005

- **Metrics:** Q1 (SCImago). 5.768 (IF).
- **Short summary:** This work describes an aggregate approach of opportunistic computing for the IoT. The approach is based on the integration of the IoT Service Metamodel and the Aggregate Computing metamodel. Validation is performed with a simulated crowd safety case study.

Peer-Reviewed Publications and Bibliometrics

Bibliometrics

- **H-index:** 25 (Gscholar), 20 (Scopus). **i10-index:** 45 (Gscholar).
- **Number of citations:** 1578 (Gscholar), 1150 (Scopus).
- **Number of publications:** 84 (80 in Scopus, 67 in WoS).
- **Number of journal publications:** 31.
  - **Number of Q1 journal publications:** 17.
  - **Number of Q2 journal publications:** 12.
  - **Number of Q3 journal publications:** 4.

All my publications (ordered by Venue and Year DESC) follow.

Journal publications

1. **R. Casadei**, G. Aguzzi, G. Audrito, F. Damiani, D. Pianini, G. Scarso, G. Torta, and M. Viroli. "Software Engineering for Collective Cyber-Physical Ecosystems". In: *ACM Transactions on Software Engineering and Methodology* (2025). DOI: 10.1145/3712004 (Q1)

2. G. Audrito, **R. Casadei**, F. Damiani, G. Torta, and M. Viroli. "Programming Distributed Collective Processes in the eXchange Calculus". In: *Logical Methods in Computer Science* Volume 21, Issue 4 (Oct. 2025). ISSN: 1860-5974. DOI: 10.46298/lmcs-21(4:3)2025 (Q2)

3. **R. Casadei**, F. Fornari, S. Mariani, and C. Savaglio. "Programming IoT systems: A focused conceptual framework and survey of approaches". In: *Internet of Things* (Feb. 2025), p. 101548. ISSN: 2542-6605. DOI: 10.1016/j.iot.2025.101548 (Q1)

4. G. Aguzzi, **R. Casadei**, and M. Viroli. "MacroSwarm: A Field-based Compositional Framework for Swarm Programming". In: *Logical Methods in Computer Science* Volume 21, Issue 3 (Aug. 2025). ISSN: 1860-5974. DOI: 10.46298/lmcs-21(3:13)2025 (Q2)

5. **R. Casadei**. "System-Wide IoT design and programming: Patterns for decentralised collective processes". In: *Internet of Things* (2024), p. 101436. DOI: 10.1016/j.iot.2024.101436 (Q1)

6. N. Farabegoli, D. Pianini, **R. Casadei**, and M. Viroli. "Dynamic IoT deployment reconfiguration: A global-level self-organisation approach". In: *Internet of Things* 28 (Dec. 2024), p. 101412. ISSN: 2542-6605. DOI: 10.1016/j.iot.2024.101412 (Q1)

7. N. Farabegoli, D. Pianini, **R. Casadei**, and M. Viroli. "Scalability through Pulverisation: Declarative deployment reconfiguration at runtime". In: *Future Generation Computer Systems* 161 (Dec. 2024), 545–558. ISSN: 0167-739X. DOI: 10.1016/j.future.2024.07.042 (Q1)

8. **R. Casadei**, L. Esterle, R. Gamble, P. Harvey, and E. F. Wanner. "Editorial: Understanding and engineering cyber-physical collectives". In: *Frontiers in Robotics and AI* 11 (2024). ISSN: 2296-9144. DOI: 10.3389/frobt.2024.1407421 (Q2)

9. G. Audrito, **R. Casadei**, and G. Torta. "A general framework and decentralised algorithms for collective computational processes". In: *Future Generation Computer Systems* 158 (2024), pp. 11–27. ISSN: 0167-739X. DOI: 10.1016/j.future.2024.04.020 (Q1)

10. G. Audrito, **R. Casadei**, F. Damiani, G. Salvaneschi, and M. Viroli. "The eXchange Calculus (XC): A functional programming language design for distributed collective systems". In: *Journal of Systems and Software* (2024), p. 111976. ISSN: 0164-1212. DOI: https://doi.org/10.1016/j.jss.2024.111976 (Q1)

11. **R. Casadei**, V. Vielmo Cogo, T. van Dijk, and A. Scalas. "Preface for the special issue on selected software artifacts from DisCoTec 2023 – the 18th International Federated Conference on Distributed Computing Techniques". In: *Science of Computer Programming* (Dec. 2024), p. 103255. ISSN: 0167-6423. DOI: 10.1016/j.scico.2024.103255 (Q3)

12. **R. Casadei**, S. Mariani, D. Pianini, M. Viroli, and F. Zambonelli. "Space-Fluid Adaptive Sampling by Self-Organisation". In: *Logical Methods in Computer Science* Volume 19, Issue 4 (Dec. 2023). ISSN: 1860-5974. DOI: 10.46298/lmcs-19(4:29)2023 (Q2)

13. **R. Casadei**. "Macroprogramming: Concepts, State of the Art, and Opportunities of Macroscopic Behaviour Modelling". In: *ACM Comput. Surv.* 55.13s (2023), pp. 1–37. ISSN: 0360-0300. DOI: 10.1145/3579353 (Q1)

14. **R. Casadei**. "Artificial Collective Intelligence Engineering: A Survey of Concepts and Perspectives". In: *Artificial Life* 29.4 (Nov. 2023), pp. 433–467. ISSN: 1064-5462. DOI: 10.1162/artl_a_00408 (Q3)

15. G. Audrito, **R. Casadei**, F. Damiani, and M. Viroli. "Computation Against a Neighbour: Addressing Large-Scale Distribution and Adaptivity with Functional Programming and Scala". In: *Logical Methods in Computer Science* Volume 19, Issue 1 (2023). DOI: 10.46298/lmcs-19(1:6)2023 (Q2)

16. **R. Casadei**, G. Fortino, D. Pianini, A. Placuzzi, C. Savaglio, and M. Viroli. "A Methodology and Simulation-Based Toolchain for Estimating Deployment Performance of Smart Collective Services at the Edge". In: *IEEE Internet of Things Journal* 9.20 (2022), pp. 20136–20148. DOI: 10.1109/JIOT.2022.3172470 (Q1)

17. G. Aguzzi, **R. Casadei**, D. Pianini, and M. Viroli. "Dynamic Decentralization Domains for the Internet of Things". In: *IEEE Internet Computing* 26.6 (2022), pp. 16–23. DOI: 10.1109/mic.2022.3216753 (Q1)

18. G. Aguzzi, G. Audrito, **R. Casadei**, F. Damiani, G. Torta, and M. Viroli. "A field-based computing approach to sensing-driven clustering in robot swarms". In: *Swarm Intelligence* (2022). ISSN: 1935-3820. DOI: 10.1007/s11721-022-00215-y (Q2)

19. D. Pianini, F. Pettinari, **R. Casadei**, and L. Esterle. "A Collective Adaptive Approach to Decentralised k-Coverage in Multi-robot Systems". In: *ACM Trans. Auton. Adapt. Syst.* 17 (2022), 4:1–4:39. DOI: 10.1145/3547145 (Q2)

20. **R. Casadei**, M. Viroli, G. Aguzzi, and D. Pianini. "ScaFi: A Scala DSL and Toolkit for Aggregate Programming". In: *SoftwareX* 20 (2022), p. 101248. ISSN: 2352-7110. DOI: https://doi.org/10.1016/j.softx.2022.101248 (Q2)

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Edited volumes (curatele)

88. **R. Casadei**, E. D. Nitto, I. Gerostathopoulos, D. Pianini, I. Dusparic, T. Wood, P. R. Nelson, E. Pournaras, N. Bencomo, S. Götz, C. Krupitzer, and C. Raibulet, eds. *IEEE International Conference on Autonomic Computing and Self-Organizing Systems, ACSOS 2022, Virtual, CA, USA, September 19-23, 2022*. IEEE, 2022. ISBN: 978-1-6654-7137-4. DOI: 10.1109/ACSOS55765.2022

89. **R. Casadei**, E. D. Nitto, I. Gerostathopoulos, D. Pianini, I. Dusparic, T. Wood, P. R. Nelson, E. Pournaras, N. Bencomo, S. Götz, C. Krupitzer, and C. Raibulet, eds. *IEEE International Conference on Autonomic Computing and Self-Organizing Systems Companion, ACSOS-C 2022, Virtual, CA, USA, September 19-23, 2022*. IEEE, 2022. ISBN: 978-1-6654-5142-0. DOI: 10.1109/ACSOS-C56246.2022

Artefacts

1. G. Aguzzi, **R. Casadei**, D. Pianini, and M. Viroli. *Dynamic decentralization domains for the Internet of Things - Simulation Repository*. 2022. DOI: 10.21227/QGBP-W789

2. G. Audrito, **R. Casadei**, F. Damiani, G. Salvaneschi, and M. Viroli. "Functional Programming for Distributed Systems with XC (Artifact)". In: *Dagstuhl Artifacts Ser.* 8.2 (2022), 08:1–08:4. DOI: 10.4230/DARTS.8.2.8

3. **R. Casadei**, M. Viroli, G. Aguzzi, and D. Pianini. "ScaFi: A Scala DSL and Toolkit for Aggregate Programming". In: *SoftwareX* 20 (2022), p. 101248. ISSN: 2352-7110. DOI: https://doi.org/10.1016/j.softx.2022.101248

4. A. Placuzzi, D. Pianini, **R. Casadei**, M. Viroli, and D. Weyns. *Pulverization in Cyber-Physical Systems: Engineering the Self-Organizing Logic Separated from Deployment (Artifact)*. aPlacuzzi/Experiment-2020-FutureInternet-LoRa (Version 0.1.0-2020-11-24T153641). 2020. DOI: 10.5281/ZENODO.4288898

Contributions (e.g. open-source/academic software projects)

SCAFI (Project Lead and Developer)
ScaFi is a Scala toolkit for Aggregate Computing: it includes a field calculus DSL,
simulator, distributed platform, and more. It is a collection of project modules
for a total of more than 140K LoC. I lead the project and development of ScaFi,
check pull requests, and coordinate work.

ALCHEMIST (Contributor)

Alchemist is a meta-simulator tailored to pervasive computing, on the JVM. I issued pull requests mainly on the ScaFi-Alchemist incarnation.

Miscellaneous Contributions

– org.protelis.protelisdoc: Kotlin gradle plugin to generate Protelis docs, via dokka

Slides @ Slideshare

Presentations corresponding to lecture notes (mainly about computer science) and conference talks.

Certifications

TS: Microsoft .NET Framework - Application Development Foundation 2011
(License 8424975 - Prometric) Bologna (Italy)

Teaching

Aggregate statistics (2020-now):

- **Total number of hours of teaching**: 345

- **Total number of taught course modules**: 13 (7 with responsibility)

- **Total number of different taught courses**: 7 (Complex Networks, Collective Intelligence, Foundations of Informatics, Software Design and Development, Algorithms and Data Structures, Mobile System Programming, Object-Oriented Programming)

- **Total number of hours in other teaching-related activities**: 300 (tutoring), 90 (IFTS)

Teaching in PhD and Higher Education courses

Big Data and Machine Learning a.y. 2023-24
		Ravenna, UNIBO
Course	6036 - Corso di Alta Formazione (CaF) in Transizione digitale nella logistica portuale	
Activity	5 hours of lectures on complex systems and complex networks, with examples in Python.	

Engineering Intelligent Collective Systems (phd course) 2021
		Cesena, UNIBO
Course	PhD Programme on Computer Science and Engineering	
Activity	I run a module of 10 hours on research themes pertaining to collective adaptive systems engineering.	

Teaching in BEng/BSc courses

11929 - Algorithm and Data Structures - 6 cfu a.y. 2024-25
		Cesena, UNIBO
Role	I got the **responsibility** for the entire course.	
Degree	First cycle degree programme (L) in Computer Systems Technologies (cod. 6007)	
Activity	I teach (for 48 hours) algorithm analysis and design, and data structures, with examples in pseudocode, C, and Python.	

09730 - Principles of Informatics - 6 cfu
a.y. 2023-24
15305 - Foundations of Informatics A - 6 cfu
Cesena, UNIBO
Role   I got the **responsibility** for the entire course.
Course   First cycle degree programme (L) in Electronics Engineering and in Biomedical Engineering
Activity   I run 3 CFUs (30 hours) of teaching and laboratory material preparation and assessment on the fundamentals of computers science (representation of information, algorithms) and the basics of imperative, structured programming in C.

95648 - Software Design and Development - 9 cfu
a.y. 2023-24
Cesena, UNIBO
Role   I got the **responsibility** for the entire course.
Course   First cycle degree programme (L) in Computer Systems Technologies
Activity   I teach (for 30 hours) the basics of software design and development, object-oriented programming, and Java.

11929 - Algorithm and Data Structures - 6 cfu
a.y. 2023-24
Cesena, UNIBO
Role   I got the **responsibility** for the entire course.
Degree   First cycle degree programme (L) in Computer Systems Technologies (cod. 6007)
Activity   I teach (for 44 hours) algorithm analysis and design, and data structures, with examples in pseudocode, C, and Python.

B3109 - Mobile System Programming Workshop Classes - 6 cfu
a.y. 2023-24
Imola, UNIBO
Role   I got the **responsibility** for the entire course.
Course   First cycle degree programme (L) in Computer Systems Technologies (cod. 6007 and cod. 5816)
Activity   I teach (for 16 hours) mobile application development, with a focus on the Android platform and Kotlin programming.

09730 - Principles of Informatics - 6 cfu
a.y. 2022-23
15305 - Foundations of Informatics A - 6 cfu
Cesena, UNIBO
Role   I got the **responsibility** for the entire course.
Course   First cycle degree programme (L) in Electronics Engineering and in Biomedical Engineering
Activity   I teach (for 30 hours) the fundamentals of computers science (representation of information, algorithms) and the basics of imperative, structured programming in C.

95648 - Software Design and Development - 9 cfu
a.y. 2022-23
Cesena, UNIBO
Role   I got the **responsibility** for the entire course.
Course   First cycle degree programme (L) in Computer Systems Technologies
Activity   I teach (for 30 hours) the basics of software design and development, object-oriented programming, and Java.

70219 - Object-Oriented Programming - Module 3
a.y. 2022-23
Cesena, UNIBO
Course   First cycle degree programme (L) in Computer Science and Engineering
Activity   I teach (for 30 hours) OOP in Java and related programming tools (version control, Eclipse, JavaFX, Gradle, etc.).

98214 - Intelligent Cyber-Physical Systems - Module 2
a.y. 2021-22
Cesena, UNIBO
Course   Minor "Smart Infrastructures"
Activity   I teach (for 20 hours) about topics related to intelligent cyber-physical systems, including tutoring for projects.

09730 - Principles of Informatics – 9 cfu

a.y. 2021-22
Cesena, UNIBO

Role   I got the **responsibility** for the entire course.

Course   First cycle degree programme (L) in Electronics Engineering (cod. 5834) and Biomedical Engineering (cod. 9082)

Activity   I run 3 CFUs (30 hours) of teaching and laboratory material preparation and assessment on the fundamentals of computers science (representation of information, algorithms) and the basics of imperative, structured programming in C.

70219 - Object-Oriented Programming - Module 3

a.y. 2021-22
Cesena, UNIBO

Course   First cycle degree programme (L) in Computer Science and Engineering

Activity   I teach (for 30 hours) OOP in Java and related programming tools (version control, Eclipse, JavaFX, Gradle, etc.).

15305 - Foundations of Informatics A - Module 2

a.y. 2020-21
Cesena, UNIBO

Course   First cycle degree programme (L) in Electronics Engineering for Energy and Information (cod. 8767)

Activity   I teach (for 30 hours) the fundamentals of computers science (representation of information, algorithms) and the basics of imperative, structured programming in C.

70219 - Object-Oriented Programming - Module 3

a.y. 2020-21
Cesena, UNIBO

Course   First cycle degree programme (L) in Computer Science and Engineering

Activity   I teach (for 30 hours) OOP in Java and related programming tools (version control, Eclipse, JavaFX, Gradle, etc.).

───── Other teaching-related activities

Tutor for course modules *Programming and Development Paradigms* and *Concurrent and Distributed Programming* (five editions)

a.y. 2016-17, 2017-18,
2018-19, 2019-20, 2020-21
Cesena, UNIBO

Course   Second cycle degree programme (LM) in Computer Science and Engineering (cod. 8614)

Activity   As a tutor, I prepare exercises, help students in doing them and following the course, and do seminars on specialised topics. These courses cover advanced programming and paradigms (functional, logic, concurrent, distributed). The contract was of 40 hours (2016-17), 60 hours (2017-18), 60 hours (2018-19), 24 hours (2019-20), 60 hours (2020-21).

Tutor for course module *Object-Oriented Programming*

a.y. 2019-20
Cesena, UNIBO

Course   First cycle degree programme (L) in Computer Science and Engineering

Activity   As a tutor, I prepare exercises (on OOP in Java) and help students in doing them and following the course. The contract is for 56 hours.

Seminars in the BBS open-program *Internet of Things*, modules *Software Production* and *Distributed Systems*

2018
Bologna Business School

Activity   I did two seminars to engineers and professionals on specialised topics: (1) software testing and (2) cloud-native application development.

30h in IFTS course "Technician for design and development of computer applications specialised in new digital technologies"

2018
Cesena

What   Higher Technical Education and Training (IFTS) is an education programme funded by the Italian Ministry of Education (MIUR).

Activity   30 hours teaching the basics of programming in Python to high-school graduates.

60h in IFTS course "Technician for design and development of computer applications specialised in business problem solving"

<div align="right">
2018
Cesena
</div>

Activity 60 hours teaching the basics of programming in JavaScript to high-school graduates.

Supervision and Mentoring of Students / Researchers

Aggregate statistics:

- **PhD students/researchers mentored:** 3

- **MEng/Msc student thesis (co-)supervision:** 11

- **BEng/Bsc student thesis (co-)supervision:** 10

- **BSc student internship supervision:** 4

Full list of (co-)supervised theses available in amslaurea.unibo.it.

PhD Students in Computer Science and Engineering

1. Gianluca Aguzzi (post-doc, former PhD student): I have been a de-facto supervisor of Gianluca during his PhD. Gianluca's research has focussed on aggregate programming and multi-agent reinforcement learning. The mentoring is also witnessed by 17 co-authored publications out of the total of 23 publications as of 2024-07 of his PhD (2021–2024).

2. Nicolas Farabegoli (PhD student): I have been mentoring Nicolas during his PhD.Nicolas' research has focussed on distributed middlewares and deployment platforms for collective computing systems. The mentoring is also witnessed by 2 co-authored publications out of the total of 3 publications as of 2024-07 during his PhD (2023–2024).

Researchers

1. Andrea Placuzzi (1-year research contract). I have been a de-facto supervisor of Andrea. His research activity has focussed on simulation and deployment techniques for collective systems. The mentoring is also witnessed by 3 co-authored publications out of the total of 3 publications of his research activity.

M.Sc. / M.Eng. Students in Computer Science and Engineering

1. Event-driven simulation and verification of FRASP systems against spatio-temporal properties, Jahrim Gabriele Cesario, 2024

2. Gestione degli effetti in linguaggi di programmazione funzionale: tecniche di modellazione e interpretazione, Giacomo Cavalieri, 2023

3. A functional-reactive perspective on the Aggregate Computing paradigm, Francesco Dente, 2023

4. A platform for aggregate computing over LoRaWAN network, Andrea Placuzzi, 2020

5. A Reinforcement Learning approach to discriminate unsafe devices in aggregate computing systems, Chiara Volonnino, 2020

6. Una piattaforma client-server universale per Aggregate Computing, Loris Cangini, 2020

7. Towards Aggregate Processes in a Field Calculus-Based Platform, Davide Foschi, 2018

8. Distributing Aggregate Computations on top of Akka Actors, Manuel Peruzzi, 2018

9. Prototyping a scalable Aggregate Computing cluster with open-source solutions, Cristian Paolucci, 2018

10. Tecniche e algoritmi di aggregate computing a supporto di contesti di smart mobility, Filippo Berlini, 2017

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✉ roby.casadei@unibo.it • 🖥 https://robertocasadei.github.io
</div>

11. Design and Deployment of an Execution Platform based on Microservices for Aggregate Computing in the Cloud, Thomas Farneti, 2017

B.Sc. / B.Eng. Students in Computer Science and Engineering

1. Progettazione e sviluppo di una web app per la somministrazione di questionari, Luca Nicolae Ferar Tofan, 2024

2. *Un'indagine sugli strumenti di supporto alle revisioni sistematiche della letteratura scientifica*, Edoardo Montanari, 2023

3. Progettazione di un ambiente di programmazione visuale block-based per ScaFi, Matteo Cerioni, 2022

4. Un framework per la graficazione di dati in Scala, Andrea Bianchi, 2022

5. Piattaforma a Supporto del Monitoraggio di Sistemi di Computazione Aggregata: Caso di Studio ScaFi-Web, Denys Grushchak, 2021

6. Progettazione di un sistema di categorizzazione delle regressioni per il compilatore Rust, Giacomo Pasini, 2020

7. Design e prototipazione di un middleware per applicazioni aggregate location-based, Linda Vitali, 2020

8. Sviluppo di una libreria in Scala di supporto alla creazione e configurazione di uno stack SMACK, Stefano Salvatori, 2018

9. Sviluppo di un front-end di simulazione per applicazioni aggregate nel framework Scafi, Gianluca Aguzzi, 2018

10. Sviluppo di applicazioni distribuite con lo stack SMACK, Emiliano Ciavatta, 2018

11. Indagine sull'utilizzo di Scala per progetti Android, Giuseppe Ettore Radaelli, 2017

Professional Experience

Full-Stack Software Engineer
Web service (WCF) and application development in ASP.NET MVC and JavaScript within a Scrum/Kanban process framework.

2014/09 → 2015/12
Apex-Net (WEDO)
Cesena (Italy)

- Server-side: ASP.NET MVC

- Client-side: ZURB Foundation, HTML, CSS3, JavaScript, JQuery, KnockoutJS

- Client-server interaction: Comet via SignalR

- Frameworks/libs: DevExpress ASP.NET MVC Extensions

- Web services: WCF (REST-style, SOAP XML & WS-*)

Mobile Software Engineer
Development of a Windows 8.1 application in C#/XAML and development of the related WCF back-end service for SharePoint integration.

2014/03 → 2014/09
Apex-Net (WEDO)
Cesena (Italy)

IT Book reviewer
During the years of high school, I used to write reviews of computer science books for an Italian e-zine (and the next years, more informally, for a personal blog) The website is dismissed: look it up on archive.org.

2007 → 2011
programmazione.it

Education

PhD Programme in Computer Science and Engineering   2016/11/01 → 2020/04/02
Thesis   Engineering self-adaptive collective processes for cyber-physical ecosys-   Università di Bologna (IT)
tems
Courses   ○ Spatial Multiagent Systems and Aggregate Computing: New Directions for
Spatial Computing (2017, A. Omicini & M. Viroli)
○ Approximation Algorithms (BISS'17, F. Grandoni)
○ Kleene Algebra with Tests and Applications to Network Programming (BISS'17,
A. Silva)
○ Models and Algorithms for Matching and Assignment Problems (S. Martello)
○ Developing, maintaining, and sharing software tools for research (D. Pianini)

24 CFU Training Programme – Anthropological, psycho-pedagogy disci-   2018
plines and teaching methodologies and technologies   Università di Bologna (IT)
Exams   ○ Anthropology, 30L/30
○ Psychology, 30/30
○ Pedagogy, special pedagogy, and didactics for inclusion, 30/30
○ General methodologies and technologies for didactics, 30L/30

Master's Degree in Computer Science and Engineering   2013/09 → 2016/03
Grade   Summa Cum Laude (Grade Average: 30/30, 6 laudes)   Università di Bologna (IT)
Thesis   Aggregate Programming in Scala: a Core Library and Actor-based
Platform for Distributed Computational Fields (supervisor: Mirko
Viroli)
Exams   ○ Artificial Intelligence (Vittorio Maniezzo), 30/30
○ Programming and Paradigms (Alessandro Ricci), 30L/30
○ Autonomous Systems (Andrea Omicini), 30L/30
○ Business Intelligence (Stefano Rizzi), 30/30
○ Computer Security (Gabriele D'Angelo), 30L/30
○ Data Base Systems (Matteo Golfarelli), 30/30
○ Distributed Systems (Andrea Omicini), 30/30
○ Engineering Complex Adaptive Software Systems (Mirko Viroli), 30/30
○ Programming Languages and Models of Computation (Gianluigi Zavattaro),
30/30
○ Project Management (Marco Antonio Boschetti), 30L/30
○ Semantic Web (Antonella Carbonaro), 30L/30
○ Software Systems Engineering (Antonio Natali), 30/30
○ Web Services and Applications (Mario Bravetti), 30L/30

Bachelor's Degree in Electronics, Informatics, and Telecommunications Engineering

2009/09 → 2013/03
Università di Bologna (IT)

Grade	Summa Cum Laude (Grade Average: 29.29/30, 5 laudes)
Thesis	Reuse Mechanisms and Concurrency: from Actors to Agent-oriented Programming (supervisor: Alessandro Ricci)
Exams	○ Automatic Controls (Paolo Castaldi), 30L/30
	○ Computer Networks (Claudio Salati), 30L/30
	○ Data Base Systems (Alessandra Lumini), 30L/30
	○ Digital Design Principles and Computer Architecture (Luca Roffia), 30/30
	○ Economics and Business Organisation (Cinzia Daraio), 28/30
	○ Electrotechnics (Franco Mastri), 28/30
	○ Foundations of Informatics A (Mirko Viroli), 30/30
	○ Foundations of Informatics B (Andrea Roli), 30/30
	○ General Physics A (Maurizio Piccinini), 28/30
	○ General Physics B (Maurizio Piccinini), 26/30
	○ Geometry and Algebra (Michele Mulazzani), 30/30
	○ Mathematical Analysis A (Massimo Cicognani), 28/30
	○ Mathematical Analysis for the Engineering Information Technology (Massimo Cicognani), 28/30
	○ Operating Systems (Alessandro Ricci), 29/30
	○ Operations Research (Daniele Vigo), 30L/30
	○ Signal Processing (Davide Dardari), 28/30
	○ Software Engineering (Antonio Natali), 30L/30
	○ Telecommunications Networks (Franco Callegati), 30L/30
	○ Web-related Technologies (Mario Bravetti), 30/30
	○ English Proficiency B1

Erasmus Programme

2012/01 → 2012/05
University of Limerick (IRL)

Courses	○ Distributed Systems (Reiner Dojen), A/A
	○ Human-Computer Interaction (Luigina Ciolfi), A/A
	○ Real-time Systems (Brian Adley), A/A
	○ Software Testing and Inspection (Norah Power), A/A

Skills and Technical Expertise

Note: this section is only indicative; current level of mastery can vary; by no means exhaustive.

Paradigms	Imperative; OOP; Functional; Reactive; Async; Logic; Agent-Oriented
Languages	Scala, Java/Kotlin, C#, C++, Ruby, Haskell, Python, JavaScript
Data	E/R modeling; relational modelling; semantic web
Design/Arch.	Design patterns; SOA/Microservices; cloud-native applications
Devops	Docker; Kubernetes; CI/CD (Gradle, Travis, GitHub Actions)
Technologies	**Cloud** – Google Cloud Platform, Amazon Web Services, Heroku
	Web dev. – HTML5; CSS3; jQuery; PHP
	Frameworks – Akka; Spring; NodeJs; ASP.NET MVC; Rails; Vert.x; RabbitMQ
	Data – MySQL; NoSQL (e.g. MongoDB)
Process	**Agile sw dev. and practices:** Scrum; (A)TDD/BDD.
	Model-driven sw dev.: UML; DSL; code-generation (XText).
	Collaborative sw dev.: version control (git); build automation (Gradle, sbt).

Languages

Italian	Mother tongue.
English	Proficient in both spoken and written English.

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Referees

Prof. Mirko Viroli, **Full Professor, Department of Computer Science and Engineering (DISI), Alma Mater Studiorum–Università di Bologna**
Prof. Viroli was my early research and PhD (and Master Thesis) advisor.

Prof. Alessandro Ricci, **Associate Professor, Department of Computer Science and Engineering (DISI), Alma Mater Studiorum–Università di Bologna**
Prof. Ricci was my Bachelor Thesis supervisor and, more recently, has been a co-author in research publications.

Referees from academia
Other referees for my academic profile include: Prof. Simon Dobson, Prof. Ferruccio Damiani, Prof. Andrea Omicini, Prof. Lukas Esterle, Prof. Jacob Beal, Prof. Giancarlo Fortino, Prof. Danny Weyns, Prof. Schahram Dustdar, Prof. Franco Zambonelli.

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