

Jacopo Massa

PH.D. CANDIDATE · RESEARCH FELLOW

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1. Education & Experience

1.1. EDUCATION

Ph.D. student in Computer Science

UNIVERSITY OF PISA / CNR-ISTI

PISA, ITALY

11/2021 – NOW

- **Thesis:** “*Declarative application and network management in the Cloud-Edge continuum*”
- **Advisors:** Antonio Brogi, Patrizio Dazzi, Stefano Forti
- **Abstract:** This thesis investigates declarative methodologies for managing applications and networks across the Cloud-Edge continuum, focusing on data-aware placement and intent-based networking. The work introduces models and prototypes that enable automated, context-sensitive distributed service deployment, based on data properties and infrastructure dynamics. It also proposes novel approaches for intent modelling, translation, and conflict resolution to support scalable orchestration of application and network configurations. The solutions are validated through simulation, emulation, and real-world case studies.

M.Sc. in Computer Science - “ICT Solutions Architect”

UNIVERSITY OF PISA

PISA, ITALY

10/2019 – 10/2021

- **Thesis:** “*Data-aware application Placement And Routing in the Cloud-IoT*”
- **Advisors:** Antonio Brogi, Stefano Forti
- **Degree Mark:** 110/110 with honors
- **Date of Achievement:** 08/10/2021
- **Abstract:** This thesis proposes declarative modelling of Cloud-IoT infrastructures and multi-service applications that separately model computing and data services. Through formal logic reasoning, the methodology determines eligible service placements and data traffic routing over Cloud-IoT resources. The proposed methodology is prototyped in Prolog and assessed via simulation over a life-like use case.

B.Sc. in Computer Science

UNIVERSITY OF PISA

PISA, ITALY

09/2016 – 10/2019

- **Thesis:** “*Voice and graphical user interface for a smart building application*”
- **Advisors:** Antonio Brogi, Stefano Forti
- **Degree Mark:** 106/110
- **Date of Achievement:** 04/10/2019
- **Abstract:** This thesis presents the design and implementation of a hybrid voice-graphical interface for smart building environments, enabling natural language interaction with IoT devices through Amazon Alexa and a touchscreen display. The system integrates multiple microservices within the GIÒ framework, allowing users to access contextual information, manage smart room goals, and control devices via voice commands or graphical input. The solution is prototyped using Python and the Alexa Skills Kit, and its usability is evaluated through real-user testing in a university setting.

1.2. ACADEMIC POSITIONS

Research grant

UNIVERSITY OF PISA, NOUS PROJECT

PISA, ITALY

09/2024 – NOW

Holder of the research grant “*Ambienti per la programmazione strutturata parallela e distribuita di infrastrutture di calcolo all’Edge*” associated with the NOUS EU-funded project, under the Horizon Europe programme.

Holder of the scholarship “Efficient solutions and approaches for AI on Edge Computing platforms”, associated with participation in the Ph.D. programme in Computer Science, funded by CNR-ISTI “A. Faedo”.

2. Academic Activities

2.1. SCIENTIFIC PUBLICATIONS

BIBLIOMETRIC INDICATORS

LAST UPDATED: November 13, 2025

GOOGLE SCHOLAR	Citations: 68	h-index: 5	i10-index: 3
SCOPUS	Citations: 41	h-index: 4	
WEB OF SCIENCE	Citations: 28	h-index: 3	
RESEARCHGATE	Citations: 56	h-index: 5	

JOURNAL PAPERS

- [J1] E. Carlini, P. Dazzi, L. Ferrucci, **J. Massa**, and M. Mordacchini, “Dynamic workload balancing in decentralized edge systems: A marginal cost approach”, *Future Generation Computer Systems*, p. 108 167, Mar. 2026, ISSN: 0167-739X.
DOI: 10.1016/j.future.2025.108167,
Quality (GGS): Q1.
- [J2] **J. Massa**, S. Forti, P. Dazzi, and A. Brogi, “Combining declarative and linear programming for application management in the cloud-edge continuum”, vol. 176, p. 108 224, 3, ISSN: 0167-739X.
DOI: 10.1016/j.future.2025.108224,
Quality (GGS): Q1.

CONFERENCE PAPERS

- [C1] M. D. Bartola, **J. Massa**, P. Dazzi, and M. Torquati, “FastFlow-Python: Parallel Building Blocks in Python Through FastFlow Integration”, in *2025 IEEE International Conference on Cloud Engineering (IC2E)*, Oct. 2025, pp. 281–289.
DOI: 10.1109/IC2E65552.2025.00046,
Quality (GGS): N.A.
- [C2] V. Besozzi, E. Carlini, M. Danelutto, P. Dazzi, M. Della Bartola, L. Ferrucci, **J. Massa**, and M. Mordacchini, “Decentralized Q-Learning for Workload Offloading in Urgent Edge Computing Scenarios”, in *Complex, Intelligent and Software Intensive Systems*, Cham: Springer Nature Switzerland, Jul. 2025, pp. 231–239.
DOI: 10.1007/978-3-031-96096-3_22,
Quality (GGS): N.A.
- [C3] E. Carlini, P. Dazzi, L. Ferrucci, **J. Massa**, and M. Mordacchini, “Marginal Cost of Computation as a Collaborative Strategy for Resource Management at the Edge”, in *Economics of Grids, Clouds, Systems, and Services*, Springer Nature Switzerland, Feb. 2025, pp. 15–27.
DOI: 10.1007/978-3-031-81226-2_3,
Quality (GGS): N.A.
- [C4] **J. Massa**, “Towards a Comprehensive Approach to Resource and Conflict Management in Cloud-Edge Settings”, in *Proceedings of the 33rd International Symposium on High-Performance Parallel and Distributed Computing*, ACM, 2024, pp. 397–400.
DOI: 10.1145/3625549.3658829,
Quality (GGS): A.
- [C5] **J. Massa**, S. Forti, F. Paganelli, P. Dazzi, and A. Brogi, “A declarative reasoning approach to conflict management in Intent-Based Networking”, in *2024 27th Conference on Innovation in Clouds, Internet and Networks*, 2024, pp. 228–233.
DOI: 10.1109/ICIN60470.2024.10494474,
Quality (GGS): N.A.
- [C6] **J. Massa**, S. Forti, F. Paganelli, P. Dazzi, and A. Brogi, “Towards declarative intent processing and conflict resolution in IBN”, in *Proceedings of the IEEE/ACM 16th International Conference on Utility and Cloud Computing*, ACM, 2024.
DOI: 10.1145/3603166.3632236,
Quality (GGS): N.A.

- [C7] T. Di Riccio, **J. Massa**, S. Forti, and A. Brogi, “Sustainable placement of VNF chains in Intent-based Networking”, in *Proceedings of the IEEE/ACM 16th International Conference on Utility and Cloud Computing*, ACM, Apr. 2024.
DOI: 10.1145/3603166.3632167,
Quality (GGS): N.A.
- [C8] **J. Massa**, S. Forti, P. Dazzi, and A. Brogi, “Declarative and Linear Programming Approaches to Service Placement, Reconciled”, in *2023 IEEE 16th International Conference on Cloud Computing (CLOUD)*, Sep. 2023, pp. 1–10.
DOI: 10.1109/CLOUD60044.2023.00033,
Quality (GGS): A-.
- [C9] **J. Massa**, S. Forti, F. Paganelli, P. Dazzi, and A. Brogi, “Declarative Provisioning of Virtual Network Function Chains in Intent-based Networks”, in *2023 IEEE 9th International Conference on Network Softwarization (NetSoft)*, Jul. 2023, pp. 522–527.
DOI: 10.1109/NetSoft57336.2023.10175449,
Quality (GGS): N.A.
- [C10] **J. Massa**, S. Forti, and A. Brogi, “Data-Aware Service Placement in the Cloud-IoT Continuum”, in *Service-Oriented Computing*, Springer International Publishing, Jun. 2022, pp. 139–158.
DOI: 10.1007/978-3-031-18304-1_8,
Quality (GGS): N.A.

WORKSHOP PAPERS

- [W1] J. Massa, S. Forti, F. Paganelli, P. Dazzi, A. Brogi, A. Clemm, and T. Eckert, “Towards Declarative Traffic Engineering for Guaranteed Latency-Based Forwarding”, in *Euro-Par 2024: Parallel Processing Workshops*, Springer Nature Switzerland, 2025, pp. 231–242.
DOI: 10.1007/978-3-031-90203-1_20,
Quality (GGS): B.
- [W2] P. Dazzi, L. Ferrucci, M. Danelutto, K. Tserpes, A. Makris, T. Theodoropoulos, **J. Massa**, E. Carlini, and M. Mordacchini, “Urgent Edge Computing”, in *Proceedings of the 4th Workshop on Flexible Resource and Application Management on the Edge (FRAME)*, ACM, 2024, pp. 7–14.
DOI: 10.1145/3659994.3660315,
Quality (GGS): A.
- [W3] **J. Massa**, “Data-Aware Application Placement and Management in the Cloud-IoT Continuum”, in *Service-Oriented Computing – ICSOC 2022 Workshops*, Springer Nature Switzerland, 2023, pp. 301–307.
DOI: 10.1007/978-3-031-26507-5_24,
Quality (GGS): A-.

THESES

- [T1] **J. Massa**, “Data-aware application placement and routing in the Cloud-IoT continuum”, M.Sc. Thesis, Dept. of Computer Science, University of Pisa, Oct. 2021.
URL: <https://etd.adm.unipi.it/theses/available/etd-09072021-120248/>.
- [T2] **J. Massa**, “Voice and graphical user interface for a smart building application”, B.Sc. Thesis, Dept. of Computer Science, University of Pisa, Oct. 2019.

UNDER SUBMISSION

- [M1] **J. Massa**, V. De Caro, S. Forti, P. Dazzi, D. Bacciu, and A. Brogi, “ECLYPSE: a Python Framework for Simulation and Emulation of the Cloud-Edge Continuum”, Jul. 2025. arXiv: 2501.17126 [cs.NI].
- [M2] **J. Massa**, S. Forti, F. Paganelli, P. Dazzi, A. Brogi, A. Clemm, and T. Eckert, “Declarative Traffic Engineering for Low-Latency and Reliable Networking”, Mar. 2025. arXiv: 2503.21289 [cs.NI].

2.2. SCIENTIFIC CONFERENCES ORGANISATION

Participation in the following international scientific conference committees:

Program Chair

- **AHPC³ 2026**, 3rd Workshop on Accelerated HPC in the Cloud edge Continuum @ PDP 2026
- **AHPC³ 2025**, 2nd Workshop on Accelerated HPC in the Cloud edge Continuum @ IC2E 2025
- **AHPC³ 2024**, 1st Workshop on Accelerated HPC in the Cloud edge Continuum @ PDP 2025

Web Chair

- **HPDC 2024**, 33rd International Symposium on High-Performance Parallel and Distributed Computing

Program Committee member

- **CLOUD COMPUTING 2026**, 17th International Conference on Cloud Computing, GRIDs, and Virtualization
- **IEEE CCNC 2026**, 23rd IEEE Consumer Communications & Networking Conference
- **ACR 2026**, 4th International Conference on Advances in Computing Research
- **IEEE SOSE 2025**, 19th IEEE International Conference on Service-Oriented System Engineering
- **MoCS 2025**, 15th Workshop on Management of Cloud and Smart City Systems
- **CSC 2025**, 11th International Conference on Connected Smart Cities
- **I3E 2025** 24th IFIP Conference e-Business, e-Services, and e-Society
- **ESOCC 2025**, 12th European Conference On Service-Oriented And Cloud Computing
- **ACR 2025**, 3rd International Conference on Advances in Computing Research
- **IEEE SOSE 2024**, 18th IEEE International Conference on Service-Oriented System Engineering
- **CSC 2024**, 10th International Conference on Connected Smart Cities
- **ESOCC 2023**, 10th European Conference On Service-Oriented And Cloud Computing
- **Microservices 2023**, 5th International Conference on Microservices
- **ACSOS 2023**, 4th International Conference on Autonomic Computing and Self-Organizing Systems

2.3. REVIEWER ACTIVITIES

Reviewing scientific contributions for the following international scientific conference series and journals:

Journal

- **Computing**
- **FGCS** – Future Generation Computer Systems
- **Heliyon**
- **IEEE TSC** – IEEE Transactions on Services Computing
- **IJNDC** – International Journal of Networked and Distributed Computing
- **JSS** – Journal of Systems & Software
- **TIOT** – ACM Transactions on Internet of Things

Conference

- **ACR** – International Conference on Advances in Computing Research
- **CCGRID** – International Symposium on Cluster, Cloud and Internet Computing
- **ESOCC** – European Conference on Service-Oriented and Cloud Computing
- **I3E** – IFIP Conference e-Business, e-Services, and e-Society
- **IEEE CLOUD** – International Conference On Cloud Computing
- **IEEE ISCC** – Symposium on Computers and Communications
- **IEEE SOSE** – International Conference on Service-Oriented System Engineering
- **IEEE STI** – Conference on Science, Technology and Innovation Indicators
- **MSCC** – Mediterranean Smart Cities Conference
- **PDP** – Euromicro International Conference on Parallel, Distributed, and Network-Based Processing

2.4. RESEARCH GROUPS

Parallel Programming Models Group

PISA, ITALY

DEPARTMENT OF COMPUTER SCIENCE, UNIVERSITY OF PISA

01/2024 – NOW

The group focuses on parallel and distributed computing, developing the FastFlow library with advanced parallel design patterns and tools optimized for multicore systems and GPUs. Their research covers parallel programming models, data stream processing, and energy-aware computing.

OSMWARE: hOlistic Sustainable Management of distributed softWARE systems

PISA, ITALY

DEPARTMENT OF COMPUTER SCIENCE, UNIVERSITY OF PISA

11/2022 – NOW

Research group comprising researchers from the namesake [project](#).

High Performance Computing Laboratory

PISA, ITALY

INSTITUTE OF INFORMATION SCIENCE AND TECHNOLOGIES “ALESSANDRO FAEDO”, CNR-ISTI

01/2022 – NOW

The HPC Lab focuses on scalable algorithms and systems for computational and data-intensive problems, including cloud systems, big data analytics, and machine learning. They develop efficient solutions for managing large datasets in near real-time, optimizing for resource constraints and application-specific trade-offs.

Service-Oriented, Cloud and Fog Computing (SOCC) Research Group

PISA, ITALY

DEPARTMENT OF COMPUTER SCIENCE, UNIVERSITY OF PISA

05/2021 – NOW

Research group coordinated by Prof. Antonio Brogi.

GIÒ: A Fog Computing Testbed for Research & Education

PISA, ITALY

DEPARTMENT OF COMPUTER SCIENCE, UNIVERSITY OF PISA

06/2019 – NOW

Research group comprising researchers from the namesake [project](#).

2.5. AWARDS

11/2024

Best Paper, GECON 2024.

[\[C3\] Marginal Cost of Computation as a Collaborative Strategy for Resource Management at the Edge.](#)

2.6. RESEARCH PROJECTS

NOUS: A catalyst for European CLOUD Services

PISA, ITALY

DEPARTMENT OF COMPUTER SCIENCE, UNIVERSITY OF PISA

09/2024 – 09/2026

- **Role:** project member.
- **Description:** NOUS is a 36-month EU-funded project, which aims to develop the architecture of a European cloud service that allows computational and data storage resources to be used from edge devices as well as supercomputers, through the HPC network, and Quantum Computers.

OSMWARE: hOlistic Sustainable Management of distributed softWARE systems

PISA, ITALY

DEPARTMENT OF COMPUTER SCIENCE, UNIVERSITY OF PISA

11/2022 – NOW

- **Role:** project member.
- **Description:** the project's aim - coordinated by Prof. Antonio Brogi - is to study prototypes and technologies to enable holistic and sustainable management of next-generation distributed software applications, also considering the economic impact.

GIÒ: A Fog Computing Testbed for Research & Education

PISA, ITALY

DEPARTMENT OF COMPUTER SCIENCE, UNIVERSITY OF PISA

06/2019 – NOW

- **Role:** project member.
- **Description:** the project - coordinated by Prof. Antonio Brogi - aims at studying and experimenting with innovative methodologies and techniques for the realisation of ambient intelligence functions on a departmental Fog network and has already produced prototypes of functions for the monitoring and irrigation of plants and for the self-regulation of the natural illumination of an environment and of a graphic-conversational interface that includes an updated interactive map of the Department.

2.7. RESEARCH SOFTWARE

ECLYPSE

 [ECLYPSE-ORG/ECLYPSE](#)

DESIGNER AND MAINTAINER

11/2024 – NOW

- **Related publications:** [M1]
- **ECLYPSE** (Edge-Cloud pYthon Platform for Simulated runtime Environments) is the first simulation library entirely written in Python for experimenting with deployment strategies in varying infrastructure conditions. It provides an interface for experimenting without and with an actual application implementation to be deployed.

dgLBF

 [DI-UNIFI-SOCC/DGLBF](#)

DESIGNER AND MAINTAINER

08/2024 – NOW

- **Related publications:** [W1, M2]
- **dgLBF** is a Prolog-based specification of the guaranteed Latency-Based Forwarding (gLBF) approach for path selection and delay configuration. The prototype determines paths and delays to meet data flow latency targets, offering a concise and extensible solution to the considered problem.

EdgeWise

 [DI-UNIFI-SOCC/EDGEWISE](#)

DESIGNER AND MAINTAINER

07/2023 – NOW

- **Related publications:** [C8, J2]
- **EDGEWISE** is a Prolog open-source prototype for comparing and combining a declarative logic programming methodology with a Mixed Integer Linear Programming approach to determine eligible placements that minimise operational costs and reduce the number of used nodes to contain the amount of data transfers. Its enhanced version **EDGEWISECR** improves the declarative stage with continuous reasoning, enabling the system to reuse existing placements and reduce unnecessary recomputation and service migrations.

DIPS

 [DI-UNIFI-SOCC/DIPS](#)

DESIGNER AND MAINTAINER

06/2023 – NOW

- **Related publications:** [C5, C7, C9]
- **DIPS** (Declarative Intent Provisioning System) is a Prolog tool that exploits a declarative methodology for modelling and processing VNF-based service provisioning intents in a high-level language. Its latest version also allows users to find static syntax conflicts among application operator and infrastructure provider intents.

DAPlacer

 [DI-UNIFI-SOCC/DAPLACER](#)

DESIGNER AND MAINTAINER

06/2022 – NOW

- **Related publications:** [C10]
- **DAPLACER** (Data-Aware Placer) is a Prolog tool for designing and proposing an eligible placement and a suitable routing strategy for a given service-oriented application within its data and requirements over a Cloud-IoT infrastructure.

2.8. SUPERVISED THESIS

10/2025

Valutazione sperimentale di un approccio per il leasing di infrastrutture Cloud-Edge
[Andrea Caggiani \(B.Sc. thesis\)](#)

10/2023

Intent-based networking e piazzamento sostenibile di catene VNF
[Tommaso Di Riccio \(B.Sc. thesis\)](#)

2.9. EVENTS

DAYstributed

 [HOMEPAGE](#)

ORGANISER AND PRESENTER

29/05/2025

DAYstributed is a one-day event on distributed/decentralized systems and related research topics. During the day there will be a series of pitch talks, where each speaker has a few minutes to present and start a discussion on their research topics.

PhD Spotlight: From Study to Research

[HOME PAGE](#)

ORGANISER AND PRESENTER

11/11/2024

The event consists of a poster session introducing M.Sc. students to the research carried out by Ph.D. students. These could become starting points for future dissertations or encourage them to continue their academic career with a Ph.D.

2.10. TEACHING EXPERIENCE

A.Y. 25/26	(20h) Laboratorio 1, Teaching Assistant	B.Sc. COURSE
A.Y. 24/25	(20h) Laboratorio 1, Teaching Assistant	B.Sc. COURSE
A.Y. 23/24	(20h) Laboratorio 1, Teaching Assistant	B.Sc. COURSE
A.Y. 22/23	(20h) Advanced Software Engineering, Teaching Assistant	M.Sc. COURSE
A.Y. 21/22	(20h) Cloud & Green Computing, Teaching Assistant	M.Sc. COURSE
A.Y. 21/22	(20h) Laboratorio 1, Teaching Assistant	B.Sc. COURSE

3. Talks

3.1. INVITED SEMINARS

08/04/2025	L'Informatica dopo la Laurea: industria, accademia e ricerca “Incontra Informatica” educational guidance event
25/05/2024	RoboPython - Laboratori di Robotica Educativa Festival della Robotica 2024
14/10/2023	Declarative Cloud-IoT continuum: Gestire applicazioni, dati e reti con la programmazione logica “UniPi Orienta” educational guidance event
16/04/2021	Assistenti Personali e Smart Building Applications “Incontra Informatica” educational guidance event

3.2. CONFERENCE ORAL PRESENTATIONS

26/09/2024	[C3] Marginal Cost of Computation as a Collaborative Strategy for Resource Management at the Edge 20th International Conference on the Economics of Grids Clouds, Systems, and Services
27/08/2024	[W1] Towards Declarative Traffic Engineering for Guaranteed Latency-Based Forwarding 2nd International Workshop on Scalable Compute Continuum
06/06/2024	[C4] Towards a Comprehensive Approach to Resource and Conflict Management in Cloud-Edge Settings 33rd International Symposium on High-Performance Parallel and Distributed Computing
06/12/2023	[C6] Towards declarative intent processing and conflict resolution in IBN 16th IEEE/ACM International Conference on Utility and Cloud Computing
06/12/2023	[C7] Sustainable placement of VNF chains in Intent-based Networking 16th IEEE/ACM International Conference on Utility and Cloud Computing
05/07/2023	[C8] Declarative and Linear Programming Approaches to Service Placement, Reconciled 16th IEEE International Conference On Cloud Computing (online)
19/06/2023	[C9] Declarative Provisioning of Virtual Network Function Chains in Intent-based Networks 3rd International Workshop on Intent-Based Networking
29/11/2022	[W3] Data-Aware Application Placement and Management in the Cloud-IoT Continuum 20th International Conference on Service-Oriented Computing

4. Skills

4.1. LANGUAGE

Italian **Mother tongue**
English **C1**

4.2. DIGITAL SKILLS

VCS **Advanced** – *Git, GitHub, GitLab*
Containerization **Advanced** – *Docker, docker-compose, Kubernetes*
Prog. Languages **Advanced** – *Python, Prolog, LaTeX, Java, C, C++, Javascript*
Python Libraries **Advanced** – *NetworkX, Ray Pandas, Keras, scikit-learn, Matplotlib, Seaborn, Plotly*