

Patricia Lago

Full Professor

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"It always seems impossible until it's done." - Nelson Mandela

Personal Information

Website <http://patricialago.nl>
Website <http://s2group.cs.vu.nl>

Research Theme

My passion in research is to create software engineering knowledge that makes software better, smarter, and more sustainable. My main focus is on the relation between software architecture and sustainability, including energy-efficiency, and in particular in software architecture design and quality assessment.

My research approach is on devising systematic, disciplined, and quantifiable approaches for designing, developing and maintaining software-intensive systems and services that have a real impact on society.

Current Positions

- Since Jan 2015 **Full professor**, Department of Computer Science, Vrije Universiteit Amsterdam, The Netherlands.
Research areas: Software Architecture design, Sustainability as a software quality property, Architecture Assessment, Empirical research.
Domains of interest: Data Centers and Cloud Provisioning, Smart City, Digital Transformation.
- Since 2024 **Head of the 'Sustainability Digital Society' Section at the Department of Computer Science, Vrije Universiteit Amsterdam**
- ★ Since Sep 2018 **Member of the Management Team** of the Department of Computer Science, Vrije Universiteit Amsterdam (Portfolio Research).
- ★ Since 2022 **Director Digital Sustainability Center (DiSC)**. More info at <https://digitalsustainabilitycenter.nl>. The official DiSC opening event was on January 18, 2023.
- Since Jan 2011 **Head of the 'Software and Sustainability' Research Group**, Vrije Universiteit Amsterdam
Mission: The S2 group carries out research on software and sustainability in general, and specifically on their socio-technical and environmental sustainability. More info at <https://s2group.cs.vu.nl>.

Education

- 1996 **Ph.D. in Systems Engineering and Computer Science**, *Department of Control and Computer Engineering, Politecnico di Torino, Italy.*
- 1992 **M.Sc. in Computer Science**, *University of Pisa, Italy.*

Qualifications

I have successfully completed a number of professionalization courses, incl.: **BKO (Basis Kennis Onderwijs) Certificate University Teaching Qualification** (granted in Spring 2014); Academic leadership; Higher education in multi-cultural environments; English certificate for higher education teaching; Active Bystander Training.

Research experience

- 2007–2014 **Associate Professor (tenured)**, *Computer Science Department at Vrije Universiteit Amsterdam*, Software and Services Research Group.
- 2003–2007 **Assistant Professor (tenured)**, *Computer Science Department at Vrije Universiteit Amsterdam*, Software Engineering Research Group.
- 1998–2003 **Assistant Professor (tenured Since 2001)**, *Department of Control and Computer Engineering, Politecnico di Torino, Italy*, Software Engineering and Network Engineering Research Group.
- 1997–1998 **Post-Doctoral Researcher**, *Department of Control and Computer Engineering, Politecnico di Torino, Italy*, on the theme of software architectures for the support of multimedia systems for distance education.
- 1996–1997 **Contract Researcher**, *Department of Control and Computer Engineering, Politecnico di Torino, Italy*, in the field of distributed software and object-oriented systems.
- 1994–1995 **Guest researcher**, *Software Engineering Group, Prof. Reidar Conradi, Norwegian University of Science and Technology (NTNU, Trondheim, Norway), Department of Computer Science*.
- 1992–1996 **PhD Candidate**, *Department of Control and Computer Engineering, Politecnico di Torino, Italy*.

Teaching Experience (selection)

I have been teaching as main lecturer since 1996. I have been tutoring various students in their Bachelor and/or Master thesis in the software- and service engineering related topics, and in their Literature studies in preparation of the Master project. Some have been carried out in collaboration with other universities (both nation-wide and internationally), industrial companies or research institutes. I have developed various courses, both for industry (like Telecom Italia, Olivetti, Lufthansa) and in academic setting.

I also actively contribute in the definition of various education programs. I worked at the definition of the current **Computer Science Master** program (from academic year 2013-2014), with special focus on two tracks: Software Engineering and Internet and Web Technology (with special focus on software services and cloud computing). I have also designed the track **Software Engineering and Green IT** (from academic year 2014-2015), and the Master Information Sciences on the **Digital Transition and Sustainability** (from academic year 2020-2021).

I am **teaching**/have taught the following courses (since at the VU Amsterdam):

Vrije Universiteit Amsterdam:

(current)

- Since 2022/2023 Fair Digital Design (Master, XM_0132, 6 ECTS)
- Since 2020/2021 Digitalization and Sustainability (Master, XM_0089, 6 ECTS)
- Since 2010/2011 Service Oriented Design (Master, X_405061, 6 ECTS)
- Since 2013/2014 Literature Study (Master, XM_0131, 6 ECTS) until 2021/22 called Literature Study and Seminar (Master, X_400277, 6 ECTS). I am the course coordinator, and also I supervise about 3 students/year.
- Since 2017/2018 Digital Architecture (Master, X_400170, 6 ECTS). Named as Software Architecture until 2021/22 (Master, XM_0127, 6 ECTS). I am the course coordinator. In addition, I have re-designed and taught editions 2017/18-2019/20.

(past)

- 2020/2021 Software Containerization (Master, X_0091, 6 ECTS, in collab. with HCL)

- until 2018/2019 Introduction to Computer Science / Information Sciences (Bachelor CS/IS, 6 ECTS)
- 2010/11–18/19 Developing Services for the Cloud (Master, X_405074, 6 ECTS, in collab. with IBM)
- 2009/10–16/17 Software Modeling (Bachelor, X_401016, 6 ECTS)
- 2010/2011 Project Web Systems (Bachelor, X_401033, 3 ECTS, coordination)
- 2005/06–09/10 Advanced Topics in Software Design (Master, X_400378, 6 ECTS)
- 2002/03–08/09 Software Engineering (Bachelor, X_400071, 4 ECTS)
- 2002/03–08/09 Software Engineering Project (Bachelor, X_400067, 8 ECTS)

University of Amsterdam:

- 2002/03–06/07 Software Architecture (1-year MSc. Software Engineering), co-lecturer

PhD-level Courses/Schools:

- ★ Jan 2020–2022 (3 editions) *Organizer and Lecturer* of the **VU Winter School** course “**Software and Sustainability: Towards an Ethical Digital Society**”. Info: <https://vu.nl/en/education/vu-graduate-winter-school>
- ★ Since 2016/2017 *Co-organizer* of the **International Software Architecture PhD School (ISAPS)**, co-sponsored by the SIKS PhD School, NWO, Lorentz Center and CGI. More info at <https://goo.gl/383fU7>
- Jul/Aug 2017 *Co-organizer* of the **International ICT4S Summer School**, Lorentz Center, July–August 2017. Organized with Steve Easterbrook (U. Toronto), Lorenz Hilty (U. Zurich, Switzerland), Mattias Höjer (KTH, Sweden), Birgit Penzenstadler (U. Long Beach, CA, USA). More info at www.lorentzcenter.nl
- Aug 2021 *Co-organizer* of the **International ICT4S Summer School**, Lorentz Center, 16–20 August 2021. Organized with Christoph Becker (U. Toronto), Jay Chen (U. Berkeley, USA), Daniel Pargman (KTH, Sweden), Daniel Schien (U. Bristol, UK). More info at <https://www.lorentzcenter.nl/international-summer-school-on-ict-for-sustainability-2021.html>
- 2017/18–18/19 *Lecturer* Service Oriented Design for Sustainability (PhD advanced course, Gran Sasso Science Institute)

Professional Courses (selected):

- Sep 2018 *Lecturer* Master Class on Software Sustainability Design and Assessment (at the Society for Information Architects (GIA – Genootschap voor Informatie Architecten))
- Jun 2018 *Organizer* of the Amsterdam Data Science (ADS) Meetup on **Sustainable Systems and Software Architectures**. More info at www.meetup.com/Amsterdam-Data-Science
- Jun 2015 *Organizer* “Data Management in the Cloud”, Event of Amsterdam Data Science (ADS), at VU Amsterdam
- Nov 2015 *Lecturer* Green and Sustainable ICT at Atos Consulting (in-house)
- Nov 2011 *Organizer* of an invited 2-day workshop (with Prof. Antony Tang) on “Software Architecture Design Reasoning”, Lufthansa, Frankfurt, Germany

Thesis Supervision:

- Master degree On average I supervise the thesis work of **10–15** Master students per academic year
- Bachelor degree On average I supervise the thesis work of **2** Bachelor students per academic year

Grants

Research Grants:

InnoGuard

- 2024–2028 Hybrid and Generative Intelligence for Trustworthy Autonomous Cyber-Physical Systems
Financial support: 3.2M EUR (total); two PhD students (for the VU)
Call: European Commission, Horizon Framework Programme, HORIZON-MSCA-2023-DN-01

- Feed4Food**
 2024-2027 Vulnerable communities driving innovation and governance for sustainable food systems in European cities
 Financial support: one Postdoc
 Call: EU project, Driving Urban Transitions Partnership (DUT)
- GROW**
 2024-2026 Graduate Research on World Wide Challenges (Global SDGs)
 Financial support: one PhD student
 Call: MSCA COFUND
- LETSGO**
 2023-2026 LEAP: Experiments on Tuning Software-systems for Greener Operations
 Financial support: one Postdoc researcher
 Call: DEI+ RVO
- SCA-Lab**
 2023-2024 Sustainable Cloud 4 All
 Financial support: two research assistants, DiSC events
 Call: 2023 Integrative Projects, VU Amsterdam Sustainability Institute
- Digital Commons**
 2023-2024 Digital Commons for Cloud micro-communities
 Financial support: four research assistants
 Call: 2023 Integrative Projects, VU Amsterdam Sustainability Institute
- SustainableCloud**
 2022-2026 Sustainable Cloud
 Financial support: two PhD students
 Call: Netherlands Organisation for Scientific Research (NWO), Open Competition
- ABN AMRO Research Lab**
 2022-2026 Sustainable IT Lab
 Financial support: one PhD student, Master Research internships
 Call: (direct funding)
- A new Cloud for a Sustainable Digital Society**
 2022-2023 Socio-Technical Sustainability of Cloud Computing
 Financial support: two research assistants
 Call: 2022 Academy Assistants, VU Network Institute
- uDevops**
 2021-2024 Software Quality Assurance for Microservice Development Operations Engineering
 Financial support: 749,800 Euro (138,000 Euro for the VU)
 Call: H2020-MSCA-RISE-2019
- LEAP: Energy Efficient Data Infrastructures Technology Landscape**
 2020-2021 LEAP (Lower Energy Acceleration Platform) Initiative
 Role: PI
 Web: [Project result: Technology Landscape](#) Foundation for the National Coalition Sustainable Digitalisation (NCDD)
 Call: RVO
- COST EUGAIN**

- 2020-2024 European Network For Gender Balance in Informatics
 Role: Coordinator of the Grants for the Short-Term Scientific Missions
 Web: eugain.eu
 Call: COST Action, Grant CA19122
- ITEA3 BUMBLE**
- 2020-2023 Blended Modeling for Enhanced Software and System Engineering
 Financial support: one postdoc, research staff and travels
 Web: itea3.org/project/bumble
- Complex vs Sustainable**
- 2020-2021 Information Systems Complexity and Sustainability
 Financial support: two research assistants
 Call: 2020 Academy Assistants, VU Network Institute
- I4FoodSec**
- 2020-2021 ICT for Food Security
 Financial support: two research assistants
 Call: 2019 Integrative Projects, VU Amsterdam Sustainability Institute
- S-Cube**
- 2008-2012 European Network of Excellence in Software Services and Systems
 Financial support: two PhD students
 Call: FP7-ICT-2007.1.2
- SAPIENSA**
- 2008-2012 Service-enAbling Pre-exl sting ENterpriSe Assets
 Financial support: one PhD student
 Call: Netherlands Organisation for Scientific Research (NWO), Jacquard Program
- Stimuleringsfondsjoint degrees**
- 2011-2012 Personal grant to stimulate initiating new Joint programs
 Financial support: 30,000 Euro
 Call: VU Amsterdam Internal funding
- Green ICT Practices**
- 2012;2013-2014 Two personal grants for the Semi-automated estimation of the cost-benefits of green ICT practices
 Financial support: 30,000 Euro
 Call: Innovatieregeling SURF Foundation
- Gendered Innovation in Computer Science**
- 2012-2013 Industrial survey on the contribution of gender balance to innovation in software projects
 Financial support: one Postdoc (1 year)
 Call: ECP (Platform voor de InformatieSamenleving)
- Energising Services (EnS)**
- 2013-2014 Energy Aware Services and Services for the Energy Sector
 Financial support: Full mobility costs
 Call: NWO Joint Scientific Thematic Research Programme (JSTP) 045.011.008
- MRA Cluster Green Software**
- 2013-2014 Research on energy-efficient software, in collaboration with UvA, HvA, data centers and software companies

Financial support: one Postdoc (0.5 fte)
Call: EFRO (European funding of EU regions)

Amsterdam Data Science (Seed Projects)

2014;2015;2016 Three projects in collaboration with the University of Amsterdam: BigData2Nets; Big Data for Green Software; Large-scale Data Gathering on Software Energy Efficiency

Financial support: 24,000 Euro

Call: ADS Seed projects

MRA Greening the Cloud

2014-2016 Research on energy-efficient software, in collaboration with UvA, HvA, Green IT Amsterdam, about 10 companies among cloud providers and cloud software vendors

Financial support: one Postdoc (0.5 fte)

Call: EFRO (European funding of EU regions)

GreenServe

2016-2018 Empirical experiments in collaboration with a.o. Green IT Amsterdam, Certios, KPMG, CobraSystems, Rabobank

Financial support: 50,000 Euro

Call: Netherlands Enterprise Agency (RVO)

MEASURE

2015-2019 Measuring Software Engineering

Web: measure.softeam-rd.eu

Call: ITEA 3

What a Waste!

2018-2019 Bridging the Gap between Development and Implementation of Corporate Social Responsibility. In collaboration with Faculty of Social Sciences.

Financial support: 15,000 Euro

VU Network Institute: Stimuleringsgelden Connected World

GRIFFIN

2005-2009 GRId For inFormatIoN about architectural knowledge

Financial support: three PhD students

Call: Netherlands Organisation for Scientific Research (NWO), Jacquard Program

Research Grants:

ML4SS

2021-2024 Topic: Machine learning for Sustainable Software

Financial support (in kind for the VU): One PhD student in collaboration with the University of L'Aquila (Italy). Six months in-person research visit at the VU.

Call: PON Italian Science Foundation. PhD candidate: Rafiullah Omar

Go 4 IT

2020-2023 Topic: Modernization of Legacy Applications: micro-services architectures and non-functional requirements

Financial support (in kind for the VU): One PhD student in collaboration with the University of L'Aquila (Italy). Six months in-person research visit at the VU.

Call: PON Italian Science Foundation. PhD candidate: Roberta Capuano (graduated 2023)

Education

Grants:

Erasmus Mundus SE4GD

2021-2026 Software Engineers for the Green Deal (SE4GD), www.se4gd.eu

Financial support: 4.46M€ for 3 hosting universities and 8 associated partners. Full scholarships and living expenses for students, researchers and staff members in mobility. About 22 fully funded Master students per year.

Call: EC Erasmus+, Erasmus Mundus EAC/A02/2019 JMD-MOB

Erasmus Mundus EUROWEB+

2008-2011 European Research and Educational Collaboration with ASIA

Financial support: 4.9M€ for 16 universities. Full scholarships and living expenses for students, researchers and staff members in mobility. We have hosted 22 fully funded Master students.

Call: EC Erasmus Mundus ECW, Lot 12

Erasmus Mundus EUROWEB

2011-2015 European Research and Educational Collaboration with Western Balkans

Financial support: 3.99M€ for 17 universities. Full scholarships and living expenses for students, researchers and staff members in mobility.

Call: EC Erasmus Mundus ECW, Lot 10

Erasmus Mundus EMA2SA

2012-2015 Erasmus Mundus Action 2 for South Africa

Financial support: Variable, depending on mobility exchanges. Full scholarships and living expenses for Master and PhD students, and academic staff.

Call: EC-Erasmus Mundus Action 2

Honors and Awards

- 2024 Best Paper Award (research papers) at the 18th European Conference on Software Architecture (ECSA) for the paper “Architectural Views: The State of Practice in Open-Source Software Projects”.
- 2024 Distinguished Open Artifact Award at the 18th European Conference on Software Architecture (ECSA) for the paper “Software Architecture Assessment for Sustainability: A Case Study”.
- 2024 Honorable Mention (research papers) at the 18th European Conference on Software Architecture (ECSA) for the paper “An Analysis of MLOps Architectures: A Systematic Mapping Study”.
- ★ Sep 2024 Elevated to the grade of **IEEE Senior Member**. IEEE Senior Membership is an honor bestowed only to those who have made significant contributions to the profession.
- ★ May 2023 **IEEE CS TCSE New Directions Award** from the IEEE Computer Society, in recognition of *her pioneering work in sustainable software where new dimensions of software engineering with enormous impact on society—such as e-waste and software energy efficiency – are considered in the software engineering process.*
- ★ Nov 2022 **Honorary doctorate** from the Norwegian University of Science and Technology (NTNU), Norway, for scientific contribution in the field of *software sustainability*.
- 2019-2020 Guest Professorship at Chalmers University of Technology, Sweden (2 years)
- 2019 ‘Best Paper Award’ at the 31st IEEE Conference on Software Engineering Education and Training (CSEE&T), collocated with 52nd Hawaii International Conference on Systems Sciences (HICSS), with the paper “*DecidArch: Playing Cards with Software Architects*”.
- 2019 The paper above also won the ‘Student Paper Award for Best Industry Studies Paper’ sponsored by IBM a.o.
- 2018 ‘Runner-Up Best Paper Award’ at the 5th International Conference on ICT for Sustainability (ICT4S 2018), with the paper “*Empirical Evaluation of the Energy Impact of Refactoring Code Smells*”.
- 2016 Best Paper Award at the 13th Working IEEE/IFIP International Conference on Software Architecture (WICSA) with the paper “*A Decision Model for Cyber-Foraging Systems*”.

Positions of Trust, Academic Service

University Level (Vrije Universiteit Amsterdam):

- Since 2014 *Mentor* in the Mentoring Program for Talented Scientists
- 2012–2013 *Member* of the Programma Commissie Internationalisering (PCI)
- 2011–2013 *Member* of the Erasmus Mundus working group

Faculty Level (Faculty of Science):

- ★ Since 2019 *Member* of the Scientific Board, VU Amsterdam Sustainability Institute
- 2012–2016 *Main Contact*, and *Coordinator* for the Computer Science Department, for the NU university building (delivery planned by end 2019)
- 2003–2013 *Member* (and *Chair* for two mandates in 2007-2012) of the Faculty Board for International Relationships (Commissie Internationalisering)

Department Level (Department of Computer Science):

- ★ Since 2019 *Program Director* of the Master Information Sciences
- Since 2020 *Coordinator* of the Academic Minor “Information Sciences” between the VU and the Amsterdam University of Applied Sciences (HvA)
- 2010- Oct 2019 *Member* (and **Chair** in the period 2012-2016) of the **Programme Board** (Opleidingscommissie - responsible for the quality of educational programmes) for the Bachelor and Master programs in Information Sciences, Dept. Computer Science, Vrije Universiteit Amsterdam.
- Sep 2010 - Apr 2019 **Member of the Scientific Council (ARW)**, Dept. Computer Science, Vrije Universiteit Amsterdam. (**Chair** ad interim Aug 2018 - Apr 2019)
Activities: the council evaluates the scientific quality of all candidates proposed for hiring or for a promotion in academic positions at the Department of Computer Science.
- 2017 - 2020 *Coordinator and Initiator* of the Academic Minor “Software Engineering” between the VU and the Amsterdam University of Applied Sciences (HvA)
- 2014-2019 *Member Executive Board and Leader Strategic Direction* on “Sustainable Systems and Software Architectures” Amsterdam Data Science, Joint initiative of the institutes for higher education and research in the Amsterdam region
- 2014-2019 *Coordinator* Software Engineering and Green IT (SEG) Track, Computer Science Master Program
- 2008-2019 *Coordinator* GSEEM: International Track Computer Science Master, Program in Global Software Engineering (Double Degree with University of L'Aquila)

National Level:

- ★ Since 2022 **Co-founder and Member of the National Coalition for Sustainable Digitalization (NCDD)**. I co-authored the Manifesto and have been signatory for VU Amsterdam. More info at <https://coalitieduurzamedigitalisering.nl>.
- Jan 2018-2023 **Member of the NWO Disciplinary Advisory Committee ‘Informatics’ (Informatica Tafel)**. The Dutch Funding Agency NWO (Domain Science) has appointed seven disciplinary advisory committees, made up of researchers, to facilitate an effective collaboration between the NWO management board and the research field nation-wide. More info at <http://goo.gl/juXuwg>.
Activities: In the Computer Science Advisory Committee, I am representative of the Software Engineering discipline nation-wide.
- Dec 2016-2022 **Voted Member of the IPN Management Board (6 years, 2 terms)**. IPN (ICT-Research Platform Netherlands) unites all Dutch academic research groups that have ICT science as their core. It acts as the authority when it comes to questions regarding future demands and possibilities of ICT science, and how to prioritize research in this field. More info at www.ict-research.nl
Activities: The board is composed of three members (period 2017-2019) and five members (since 2019). My portfolio was *liaison with industry* and included contact with: ICT With Industry, SIG VERSEN, and NWO Informatica Tafel.

- 2016-2020 **Vice-chair of VERSEN**, which is the Dutch National Association for Software Engineering. More info at www.versen.nl.
- 2015-2019 *Member* of the Informatics Advisory Board, Lorentz Center, Leiden. More info at www.lorentzcenter.nl.
- International Level:**
- Since 2023 *Member* PhD Stakeholders Advisory Board for the PhD programme in Computer and Control Engineering of Politecnico di Torino.
- June 2019 *Panel member* for Research and Impact Assessment (research visitation) of [Lappeenranta University of Technology \(LUT\)](http://Lappeenranta University of Technology (LUT)).
- Oct 2020 - Oct 2024 *Lead of the grants* for Research visits in CA19122 EUGAIN (European Network For Gender Balance in Informatics). EUGAIN is a COST Action (see also funding section) aimed to improve gender balance in Informatics at all levels through the creation of a European network of colleagues working on the forefront of the efforts for gender balance in Informatics in their countries and research communities. More info at <https://eugain.eu>
- Activities: I was a member of the Core Team, and the Coordinator of the Short-Term Scientific Missions (period 2020-2024) which provided financial support for (young) researchers for career growth and scientific impact in the scope of EUGAIN.
- Advisory Boards (most recent):**
- Since 2022 *SURF "Open Innovation Lab" Expert Group*. SURF is the collaborative ICT organisation for Dutch education and research. SURF offers students, lecturers and scientists in the Netherlands access to the best possible internet and ICT facilities. More info at www.surf.nl/en.
- Since 2023 PhD Stakeholders Advisory Committee - PhD programme in Computer and Control Engineering, Politecnico di Torino, Italy. The Committee meets periodically and advises on the relevance of the PhD programme for the job market, and its scientific quality.
- Sep 2020-Aug 2023 *Advisory Board member* of the SusTrainable Erasmus+ Project. More info at <https://sustrainable.github.io>.
- 2016-2018 *SURF Advisory Board - Innovation Program on Computing- and Data Infrastructure*.

Positions of Trust, Societal Impact

National level

- 2023 Invitation as an Expert in "Digitalization and Sustainability" by the Standing Committee for Digital Affairs (*Commissie DiZa*), the House of Representatives of the Dutch Parliament of the Netherlands. First Round-table postponed due to the Political Elections (Nov. 2023)
- 2023-2024 Member Scientific Committee of the NWO Perspective funding programme of the TTW Domain (annual budget of 24 M€ from the Ministry of Economic Affairs and Climate)
- 2023 Nomination for the **2023 Computable Awards** for the "Archive of Awesome and Dark Tactics, in the category "education projects". Nominations are anonymous and come from the job market. The awards are annual and nationwide.

International level

- 2025 I have been invited (and accepted) to Chair the 2025 TCSE New Directions Selection Committee
- 2024 (★in progress) I have been nominated for being elected as At-Large Member of IEEE Computer Society Technical Community On Software Engineering (IEEE CS TCSE).

External Reviewer/Referee

- expert reviewer I am regularly asked to participate as an expert reviewer of competitive project proposals submitted to national and international funding agencies.

Examples include: Marie Skłodowska-Curie COFUND fellowship programme at the Science Foundation **Ireland** Research Centre for Software; the National Research Council of **Canada** (NSERC); Research Funds at Free University of Bolzano-Bozen, Italy (2024); Netherlands Organisation for Scientific Research (NWO, **The Netherlands**); Italian Ministry of Education, University and Research (MIUR, **Italy**); National Agency for the Evaluation of Universities and Research Institutes (ANVUR, **Italy**); Austrian Science Fund (FWF, **Austria**); Funding agency IWT-Vlaanderen (**Belgium**); Vinnova Swedish Innovation Agency (**Sweden**); The Knowledge Foundation (KKS, **Sweden**); The French National Research Agency (ANR, **France**).

expert contributor

I am regularly asked to contribute to international policy documents or standards, as an expert in the field of software sustainability and digitalization. Examples include: "Strong Sustainability by Design" (**IEEE Standards Association**); the Energy Efficiency Directive (EED, EU/2023/1791) for data centers to report their environmental impact (**European Commission**)

habilitation committee

Evaluation of the habilitation thesis, Dr. Ilche Georgievski, University of Stuttgart, Germany

Editorial Boards and Working Groups

- ★ Since 2024 *Editorial Board Member* ACM Transactions on Autonomous and Adaptive Systems (TAAS)
- ★ Since 2024 *Associate Editor* IEEE Software
- Since 2010 *Senior Associate Editor* Elsevier Journal of Systems and Software
- Since 2010 *Member of the* IFIP 2.10 Working group on Software Architecture
- 2012-2022 *Member Editorial Board* Wiley Journal of Software: Evolution and Process
- 2011-2022 *Member of the* IFIP 2.14 Working group on Services-based Systems
- 2012-2020 *Member of the* Women in Informatics Research and Education (WIRE) Working Group at [Informatics Europe](#).

Program committees, chairing and reviewing activities (selection)

International journals

Guest Editor

I have been guest editor of special issues in the following international journals:

- o International Journal on Empirical Software Engineering (EMSE), Springer
- o Journal of Systems and Software (JSS), Elsevier
- o Journal of Software: Evolution and Process (JSEP), Wiley
- o IEEE Software magazine

Reviewer

I regularly review submissions for the following international journals:

- o Transactions On Software Engineering (TSE), IEEE
- o Transactions On Software Engineering And Methodology (TOSEM), ACM
- o Journal of Systems and Software (JSS), Elsevier
- o International Journal on Empirical Software Engineering (EMSE), Springer
- o Journal of Information and Software Technology (IST), Elsevier
- o Journal of Software: Evolution and Process (JSEP), Wiley
- o Software magazine, IEEE
- o Journal of Sustainable Computing, Elsevier

International Conferences and Workshops (selection)

SC member

- ★ Since 2020 *Chair of the* ICT4S Steering Committee
- 2011-2016 *Chair of the* IEEE/IFIP WICSA Steering Committee (two mandates)
- ★ Since 2010 *Member of the* IEEE ICSA Steering Committee (was IEEE/IFIP WICSA until 2016)
- Since 2014 *Member of* ICT4S Steering Committee

Since 2013 *Member of ECSA Steering Committee*

Organisation

- 2025 *Program Co-chair of IEEE ICSE Early Career Track*
- ★ 2024 *Sustainability Co-chair of IEEE/ACM ICSE conference*
- 2024 *Program Co-chair of the International Conference on the Quality of Information and Communications Technology (QUATIC)*
- ★ 2023 *Sustainability Co-chair of IEEE/ACM ICSE conference*
- 2022 *Program Co-chair of IEEE ICSE track on New and Emerging Ideas (NEMI)*
- 2021 *Program Co-chair of IEEE/ACM ICSE track on New Ideas and Emerging Results (NIER)*
- 2020 *Program Co-chair of EASE track on Vision Papers and Emerging Results*
- 2018 *Program Co-chair of IEEE/ACM ICSE track on Software Engineering Education and Training (SEET)*
- 2017 *Workshop Co-chair of ACM ESEC/FSE*
- 2016 *Program Co-chair of the International conference on ICT 4 Sustainability (ICT4S)*
- 2015 *Program Co-chair of IEEE/IFIP WICSA*
- ★ 2015 *Program Co-chair of (first) IEEE/ACM ICSE track on Software Engineering in Society (SEIS)*
- 2014 *Program Co-chair of the International conference on ICT 4 Sustainability (ICT4S)*
- 2011 *Program Co-chair of IEEE/IFIP WICSA*
- 2009 *Local Chair of ACM ESEC/FSE*

PC member (a.o.)

- o IEEE International Conference on Software Architecture (ICSA)
- o Working IEEE/IFIP Conference on Software Architecture (WICSA)
- o ACM/IEEE International Conference on Software Engineering (ICSE) for both the main track and other tracks
- o ACM Joint European Software Engineering Conference and Symposium on the Foundations of Software Engineering (ESEC/FSE)
- o European Conference on Software Architecture (ECSA)
- o ACM/IEEE International Symposium on Empirical Software Engineering and Measurement (ESEM)
- o International Conference on ICT for Sustainability (ICT4S)
- 2018 Minerva Informatics Equality Award, at Informatics Europe

Current PhD Students

Vrije Universiteit Amsterdam

- o Robert Deckers (collab. with Theoretical Computer Science Group)
- o Anjana Mohandas Sheeladevi (Double PhD Degree with Amrita University, India)
- o Markus Funke
- o Iffat Fatima
- o Joran Leest
- o Engelbert Fellingner (external PhD student)

As formal promotor

- o Rumbidzai Chitakunye
- o Lauren Olson
- o Ricarda Anna-Lena Fisher (external PhD student)
- o Elvin Alberts (cofinanced with TU Delft)
- o Faezeh Amou Najafabadi
- o Keerthiga Rajenthiram
- o Tom Humbert

As co-promotor

o Sahar Ahmadisakha (with University of Groningen)

Past PhD Supervision

As 1st promotor

- Apr 2024 Razieh Alidoosti (Double PhD Degree with GSSI, Italy)
- Dec 2021 Eoin Grua (Innovation PhD program, w/ Computational Intelligence|QDA Groups)
- Sep 2021 Roberto Verdecchia (Double PhD Degree with GSSI, Italy)
- Sep 2020 Albert Hankel (with SURFnet & Utrecht University)
- Sep 2019 Martin van den Berg (with De Nederlandse Bank)
- Apr 2019 Fahimeh Alizadeh Moghaddam (Innovation PhD program, w/ University of Amsterdam)
- Jun 2016 Grace Lewis (with Software Engineering Institute, Carnegie Mellon University)
- May 2015 Giuseppe Procaccianti (Double PhD degree VU Amsterdam & Politecnico di Torino)
- 2005 Andrea Capiluppi (Politecnico di Torino, Italy)
- 2004 Paolo Falcarin (Politecnico di Torino, Italy)
- 2004 Riccardo Scandariato (Politecnico di Torino, Italy)

As co-promotor

- Mar 2014 Damian A. Tamburri (Vrije Universiteit Amsterdam)
- Apr 2013 Maryam Razavian (Vrije Universiteit Amsterdam)
- Dec 2011 Viktor Clerc (Vrije Universiteit Amsterdam)
- Oct 2011 Qing Gu (Vrije Universiteit Amsterdam)
- Oct 2009 Rik Farenhorst (Vrije Universiteit Amsterdam)
- Oct 2009 Remco de Boer (Vrije Universiteit Amsterdam)

As a committee member

- 2024 Henk Plessius, Open University, The Netherlands
- 2024 Rimma Dzhushupova, Technical University Eindhoven, The Netherlands
- 2024 Mael Madon, University of Toulouse, France
- 2023 Marco Gaglianese, University of Pisa (year 2)
- 2022 Carianne Pretorius, Technical University Eindhoven
- 2022 Dolly Sapra, University of Amsterdam
- 2022 Ali El Hassouni, Vrije Universiteit Amsterdam
- 2021 Ilaria Pigazzini, Università degli Studi di Milano-Bicocca, Italy
- 2021 Nicole Goedhart, Vrije Universiteit Amsterdam
- 2021 Roshan Das, Vrije Universiteit Amsterdam
- 2020 Siamak Farshidi, Utrecht University
- 2020 Arash Khabbaz Saberi, Technical University Eindhoven
- 2020 Jan Bieser, University of Zurich, Switzerland
- 2020 Javier Mancebo Pavón, University of Castilla La Mancha, Spain
- 2020 Preethu Rose Anish, University of Twente
- 2019 Anca Dumitrache, Vrije Universiteit Amsterdam
- 2019 Shola Oyedeji, Lappeenranta-Lahti University of Technology, Finland
- 2019 Gerard Wagenaar, Utrecht University
- 2018 Amin Tabatabaei, Vrije Universiteit Amsterdam
- 2018 Terese Besker, Chalmers University of Technology, Sweden (licentiate thesis, opponent)
- 2017 Xueliang Li, Roskilde University, Sweden
- 2017 John Klein, Vrije Universiteit Amsterdam

- 2017 Daniel Ståhl, University of Groningen
- 2017 Scott Barnett, Swinburne University of Technology, Australia
- 2016 Yevgeniya Arushanyan, KTH Royal Institute of Technology, Sweden
- 2016 Bernard van Gastel, Open University, Heerlen
- 2016 Dilhan J. Thilakarathne, Vrije Universiteit Amsterdam
- 2015 Daniela Remenska, Vrije Universiteit Amsterdam
- 2015 Adnan Shahzada, Politecnico di Milano, Italy
- 2014 Christina Manteli, Vrije Universiteit Amsterdam
- 2014 Ben van Gameren, TU Delft
- 2014 Ivan Razo-Zapata, Vrije Universiteit Amsterdam
- 2014 Marcin Nowak, Università della Svizzera Italiana, Switzerland
- 2013 Dinh Khoa Nguyen, Tilburg University
- 2013 Eric Bouwers, TU Delft
- 2012 Nick Palmer, Vrije Universiteit Amsterdam
- 2012 Eltjo Poort, Vrije Universiteit Amsterdam
- 2012 Ivano Malavolta, University of L'Aquila, Italy
- 2012 Bartosz Michalik, Katholieke Universiteit Leuven, Belgium
- 2011 Hongyu Pei-Breivold, Malardalen University, Sweden (opponent)
- 2011 Odd Petter Nord Slyngstad, NTNU, Norway (opponent)
- 2011 Håkan Gustavsson, Malardalen University, Sweden
- 2009 Hongyu Pei-Breivold, Malardalen University, Sweden (licentiate thesis, opponent)
- 2009 Jose L. Arciniegas, UPM, Spain
- 2006 M. Ali Babar, University of New South Wales, Australia
- 2006 Felix Cuadrado Latasa, UPM, Spain

Keynotes, Invited Talks, Tutorials and Guest Lectures (selection)

- Apr/May 2025 Keynote at International Conference on Software Engineering (ICSE) on *to be announced*, <https://conf.researchr.org/home/icse-2025>, Ottawa, Canada
- Spring 2025 Invited member Panel of experts on “Software, Sustainability, AI”, at Fondazione Bruno Kessler (FBK), Trento, Italy.
- Dec 2024 Invited member Panel of experts on “AI and sustainability”, at Amsterdam AI Highlights Event, December 12th, Amsterdam, The Netherlands.
- June 2024 Invited talk “Research and Education in Software and Sustainability” at Amrita University, Campus Amritapuri, India
- June 2024 Invited member Panel of experts on “Software Architecture in the Age of Generative AI”, IEEE ICSA conference, Industry Day, June 8th, Hyderabad, India
- June 2024 Tutorial “Architecting for Sustainability with the SAF Toolkit”, IEEE ICSA conference, Hyderabad, India
- May 2024 Invited member Panel of experts on “Sustainability & AI”, SURF Research Day, May 30th in Amersfoort, The Netherlands
- May 2024 Invited talk "Grip on Sustainability: Software Architecture Design Decision Making with the SAF Toolkit" at Green IT Conference with theme “From Insights to Impact”, 14 May 2024, Kas, Woerden, the Netherlands
- Apr 2024 Invited member Panel of experts on “Best practices in increasing gender balance across careers”, at GE@ICSE: Fifth Workshop on Gender Equality, Diversity, and Inclusion in Software Engineering, ACM/IEEE ICSE, Lisbon, Portugal
- Nov 2023 Invited talk and workshop moderation "From PhD to Junior Faculty" at NTNU Junior Faculty Workshop, 13-14 Nov. 2023, Trondheim, Norway

- Jan 2023 Invited talk at SusTrainable Event Teacher's Training 23-27 January 2023 (<https://sustrainable.github.io>), Pula, Croatia
- November 2022 Keynote at NTNU Seminar on "Sustainability and Inclusion in Software Engineering" (in the occasion of the award ceremony of my doctorate honoris causa).
- October 2022 Invited talk at ECSS Early Career Researchers Workshop, Hamburg, Germany
- October 2022 Keynote at 36th Brazilian Symposium on Software Engineering (SBES) on *Software Sustainability: the Challenges and Opportunities for Practitioners and Researchers*
- September 2022 Keynote at European Conference on Software Architecture (ECSA) on *Software Sustainability: What it means for Software Architects and Why Should We Care*, <https://conf.researchr.org/home/ecsa-2022>, Prague, Czech Republic
- June 2022 Keynote at MESA+ Yearly Conference on *Empowering Software Solutions for Cloud Sustainability* www.utwente.nl/en/mesaplus/meeting/program
- Dec 2021 Guest lecture at University of L'Aquila, Italy (Software Architecture Master course)
- Nov 2021 Keynote at IFIP WG 8.1 Working Conference on the Practice of Enterprise Modelling (PoEM)
- Jun 2021 Invited talk at IT Circle (www.itcircle-nederland.nl), The Netherlands
- Jun 2020 Invited member Panel of experts, Doctoral Symposium ICT4S Conference, Bristol, UK
- Mar 2020 Invited talk at Chalmers University of Technology, Gothenburg, Sweden
- Nov 2019 Invited talk at the Digital Architecture Design Day, see www.digitalarchitecturedesignday.com
- Oct 2019 Invited talk at NWO - Lorentz Center "Connect Symposium", Leiden
- May 2019 Invited talk at the Innovation Festival of DNB (Central Bank of The Netherlands), Amsterdam
- May 2019 Invited talk at the "New Faculty Symposium", at ICSE 2019, Montreal, Canada
- Mar 2019 Invited at the Panel "Future challenges in architecting and potential remedies" at ICSA 2019, Hamburg, Germany
- Oct 2018 Panel of Experts at the "5th Sustainable Business Challenge 2018", Nuon Headquarters, Amsterdam, Netherlands
- Sep 2018 Keynote on "Architecting for Sustainability" at Association of Information Architects, Utrecht, Netherlands
- May 2018 Panelist on "Software Engineering in Society" at IEEE/ACM ICSE Conference, SEIS Track, Gothenburg, Sweden
- May 2018 Panelist on "If I Knew Then What I Know Now" at IEEE ICSA Conference, Early Career Researchers Forum, Seattle, WA, USA
- Jul 2017 Guest lecture "Designing Software with a Sustainability Intent", at ICT4S Summer School, Lorentz Center, Leiden
- Mar 2017 Invited talk "Sustainable Software for a Digital Society" at "Digitalisation - Opportunities and Challenges", Chalmers University of Technology, Gothenburg, Sweden
- Apr 2016 Seminar "The Ghosts of Legacy Software" at Utrecht University
- Sep 2016 Invited talk "The Legacy of unsustainable Software" at 4th Workshop on Sustainable Software for Science: Practice and Experiences (WSSSPE), Univ. of Manchester, UK
- Jun 2016 Tutorial "Sustainability in Information Systems Engineering and Research" (with Sergio Espana, Utrecht Univ.), at CAiSE conference, Ljubljana, Slovenia
- May 2015 Keynote "Challenges and opportunities for sustainable software", at IEEE/ACM ICSE Conference, PLEASE workshop, Florence, Italy
- Mar 2015 Invited talk "Software for a Greener Cloud" at Software Industry Conference (SINC), Bussum
- Mar 2015 Invited talk on Energy-Efficient Software, CIO Meeting of the Dutch Government, The Hague
- Apr 2014 Panelist on "The relevance of academic research to industry" at IEEE/IFIP WICSA, Sydney, Australia
- Apr 2014 Bird of a Feather Session on "Talking to Industry" (with Len Bass, CMU), at IEEE/IFIP Working Conference on Software Architecture, Sydney, Australia

- Apr 2014 Bird of a Feather Session on “Energy-aware software architectures: what are the challenges for research?” (with Henry Muccini, Univ. L’Aquila), at IEEE/IFIP Working Conference on Software Architecture, Sydney, Australia
- Jan 2014 Invited talk “The Added Value of Gender diversity in the IT profession”, Oracle Women Leadership Roundtable, Utrecht
- Dec 2013 Invited lecture “Agile Software Development”, NTNU, Trondheim, Norway
- March 2013 Invited talk “An open online library of Green ICT practices”, GreenITnet EU project, New Energy Docks, Amsterdam
- Feb 2013 Invited talk “Green ICT Practices”, Joint meeting IFIP WG 9.2 (Social Accountability and Computing) & IFIP WG 9.9 (ICT and Sustainable Development), Zurich, Switzerland
- Dec 2012 Seminar “Supporting GSE: from Organizational Social Structures to Agile Service Networks”, Free University of Bolzano, Italy
- Dec 2012 Invited talk “Social Structures in Software Engineering”, University of Groningen
- Nov 2012 Seminar “Supporting GSE Communities with Agile Service Networks”, Centrum Wiskunde & Informatica (CWI), Amsterdam
- Oct 2012 Invited lecture “Green IT”, Bachelor Computer Science & Bachelor Information Sciences
- Mar 2012 Invited speaker “The Shrinking Woman in Computer Science”, conference Every Woman Digital!, organized by VHTO, hosted by IBM Amsterdam
- Dec 2011 Keynote “The role of women in Computer Science, 30 Year Celebration of Computer Science Education in Amsterdam, at De Rode Hoed, Amsterdam
- Nov 2011 Invited talk “From Green Strategies To Green Actions: how to make software greener”, at Seminar series on “Future Challenges in Software and Systems Architecture Research” at Mälardalen University and ABB Corporate Research, Västerås, Sweden
- Oct 2011 Invited talk Kick-start of the “Knowledge Network Green Software”, on “From Green Strategies to Green Actions: how, which and why?”, hosted by TNO
- Aug 2011 Seminar “on Green Architecting”, at Software Improvement Group (SIG), Amsterdam
- Jun 2011 Invited talk “A Green Knowledge Incubator”, at Workshop of the Consortium Green IT Amsterdam, on “Green Software Architecture”, hosted by CWI
- Jun 2011 Invited lightening talk “How to make Architectures Greener”, at IEEE/IFIP WICSA Conference & CompArch 2011, Boulder, CO, USA
- Oct 2010 Invited talk “Education in Green ICT -vision and current status”, Symposium on “Duurzame ontwikkeling in ICT onderwijs” (Sustainable development in ICT education, in Dutch) at Surf Foundation, Utrecht

Publications

- o I have published more than 300 papers, many of which are published in the top venues in my field. My publications are available on my [Google Scholar Profile](#) or [VU Research Portal](#).
- o My profile on Google Scholar [27 October, 2024]: **h-index 50** (32 in the past 5 years), with 9647 citations and i10-index 179 (116 in the past 5 years).

Valorisation and Marketing

- o The Sustainability Assessment Framework (SAF) Toolkit: Instruments to help Sustainability-driven Software Architecture Design Decision Making, online at <https://github.com/S2-group/SAF-Toolkit>. Sharing a set of instruments, resulting from research, to design the network of sustainability-quality concerns at the software architecture level, and define and operationalize them.

- o The Archive of Awesome and Dark Tactics, online at <https://s2group.cs.vu.nl/AwesomeAndDarkTactics>. Sharing reusable architecture tactics and software practices synthesized from research projects and existing literature.
- Sep 2018- Dec 2021 *Co-organiser* Series of events on Software Architecture and Sustainability (at the Society for Information Architects (GIA – Genootschap voor Informatie Architecten (now Digital Architects NetWork www.danw.nl)))
- Mar 2018-2024 *Presenter* Master Information Sciences, VU Master Day (twice a year)
- Jan 2018, 2019 *Presenter* Academic Track Master CS-SEG, HvA Information Day

Other

- 2018-2024 PhD double degree Framework Agreement with GSSI, L'Aquila, Italy
- 2018-2025 PhD double degree Framework Agreement with Amrita University, Amrita Puri, India
- o Before moving to the Netherlands (in 2013), I have been leading the Software Engineering group at Politecnico di Torino, Dept. of Control and Computer Engineering for about 3 years. In such period I have obtained external funding for both EU projects, Italian national projects, and industrial research contracts (e.g. with Motorola, Telecom Italia) as well as industrial fellowships (CISCO systems, TINA, and Eurescom) in excess of 500K€
- o I have been *Co-organizer* of various impactful international workshops, including: Architecting with MicroServices (AMS) [2017], Sharing and Reusing Architectural Knowledge (SHARK) [2006-2011] and Green and Sustainable Software (GREENS) [2012-2016; 2023; steering committee member since 2024]
- o I have co-edited two books published by Springer: 'Software Architecture Knowledge Management – Theory and Practice' (2009), and 'Relating Requirements and Architecture' (2011)
- 2009-2018 *Member* of the Consortium Green IT Amsterdam (www.greenitamsterdam.nl)
- 2009-2016 *Member* of the Steering Committee of the Dutch Industrial Software Architecture Conference (www.laccongres.nl). Now called DADD: Digital Architecture Design Day.
- 2017-2023 *Member* of the Steering Committee of the 'ICT with Industry' workshop series (<http://ict-research.nl/ict-with-industry>)
- Since 2015 *Member* of the DANW - Digital Architects NetWork (www.danw.nl). Until end 2021 it was called Nederlands Architectuur Forum (Naf) - the Dutch Association of Software Architects
- Since 1992 *Member* of IEEE Computer Society, and ACM SIGSOFT
- Sep. 2000-Aug. 2003 *External examiner* Dept. Computer and Information Science, Norwegian University of Science and Technology (NTNU), Trondheim, Norway
- Dec. 1995, May 1996, Aug. 1996 *Consultancies* for Telecom Italia, CSELT (Telecommunication Research Lab), Italy, on TINA (Telecommunication Information Network Architecture)