**EUROPEAN CURRICULUM VITAE FORMAT**

## PERSONAL INFORMATION

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| Name | **BONFANTI, Silvia** |
| E-mail | silvia.bonfanti@unibg.it |

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| Dates | 22nd of January 2018 |
| Order registration | Registration at Order of engineering (**Ordine degli ingegneri**) |
| Number | A4545 |

## WORK EXPERIENCE

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| • Dates (from – to) | From January 2023 to date |
| • Name and address of employer | Università degli Studi di Bergamo<br>Viale Salvecchio, 19 - 24129 – Bergamo |
| • Type of business or sector | Research |
| • Occupation or position held | **Research associate** - RTD-A |
| • Main activities/projects | • SAFEST: Trust assurance of Digital Twins for medical cyber-physical systems (https://foselab.github.io/projects/Safest/)<br>• MVM-Adapt (https://foselab.github.io/projects/MVM_Adapt/)<br>• Software engineering<br>• Software testing<br>• Testing of Neural Network<br>• Formal methods: ASMETA (http://asmeta.sourceforge.net/)<br>• Quality of Medical software<br>• Medical software certification<br>• 3D4Amb project (http://3d4amb.unibg.it/): development of software to diagnose and treatment of amblyopia |
| • Dates (from – to) | From June 2018 to December 2022 |
| • Name and address of employer | Università degli Studi di Bergamo<br>Viale Salvecchio, 19 - 24129 – Bergamo |
| • Type of business or sector | Research |
| • Occupation or position held | Research fellow - **PostDoc** |
| • Main activities and responsibilities | Development of software in medical field to improve patient health monitoring<br>• Quality of Medical software<br>• SE4Med project (https://se4med.unibg.it/): Software Engineering for MEdical Devices<br>• Medical software certification<br>• 3D4Amb project (http://3d4amb.unibg.it/): development of software to diagnose and treatment of amblyopia<br>• ASMETA project (http://asmeta.sourceforge.net/): framework for Abstract State Machine |
| • Dates (from – to) | From May 2017 to June 2018 |
| • Name and address of employer | Università degli Studi di Bergamo<br>Viale Salvecchio, 19 - 24129 – Bergamo |

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| • Type of business or sector | Research |
| • Occupation or position held | Research fellow in collaboration with SCCH (Software Competence Center Hagenberg: https://www.scch.at/en/) - **PostDoc** |
| • Main activities and responsibilities | • 3D4Amb project (http://3d4amb.unibg.it/)<br>• Medical software certification<br>• ASMETA project (http://asmeta.sourceforge.net/) |
| • Dates (from – to) | From June 2007 to July 2007 |
| • Name and address of employer | Elabora s.r.l. |
| • Type of business or sector | Development softwares |
| • Occupation or position held | Internship |
| • Main activities and responsibilities | Different tasks (accounting, contract management..) different sectors with a mate assignment. |

| **TEACHING** | |
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| • Course | Gestione dei sistemi ICT AA 2023/2024, AA 2024/2025 |
| • Course | Basic Computer Science (ENG) course of Medicine and Surgery AA 2023/2024, AA 2024/2025, AA 2025/2026 |
| • Course | PhD course: Uso di StrumenTi Informatici a supporto del Ricercatore (USTIR) AA 2020/2021, AA 2022/2023, AA 2023/2024, AA 2024/2025, AA 2025/2026 |
| • Course | Exercises Software Engineering AA 2021/2022, AA 2022/2023, AA 2023/2024, AA 2024/2025, AA 2025/2026 |
| • Course | Adjunct Professor: Mobile App Lab AA 2019/2020, AA 2020/2021, AA 2021/2022 |
| • Course | PhD course in Applied Economics and Management (AEM): Computer Coding (Python) AA 2020/2021, AA 2021/2022 |
| • Course | Exercises Software Engineering AA 2021/2022, AA 2022/2023, AA 2023/2024 |
| • Course | Exercises in Basic programming (Python) AA 2020/2021 |
| • Course | Exercises in DataBase AA 2017/2018, AA 2019/2020 |
| • Course | Exercises in Fundamentals of programming (OO and procedural) and software design: module of programming AA 2017/2018, AA 2018/2019, AA 2019/2020, AA 2020/2021 |
| • Course | Exercises in Java programming AA 2014/2015, AA 2015/2016, AA 2016/2017, AA 2017/2018, , AA 2018/2019, AA 2019/2020 |
| • Course | Exercises in Testing and Software Verification AA 2017/2018, AA 2018/2019, AA 2019/2020 |
| • Course | Exercises in Operating System AA 2014/2015, AA 2016/2017, AA 2017/2018 |
| • Course | Exercises in Control Systems course AA 2013/2014 |
| • Name and address of employer | Università degli Studi di Bergamo<br>Viale Salvecchio, 19 - 24129 – Bergamo |
| • Course | Adjunct Professor: Basic Computer Science (ENG) course of Medicine and Surgery AA 2019/2020, AA 2020/2021, AA 2021/2022, AA 2022/2023 |
| • Name and address of employer | Università degli Studi di Milano-Bicocca<br>Piazza dell'Ateneo Nuovo, 1 - 20126, Milano |
| • Course | Exercises Software Engineering AA 2016/2017 |
| • Course | Tutorial in Modelling and System Analysis AA 2014/2015 |
| • Name and address of employer | Università degli Studi di Milano<br>Via Festa del Perdono, 7 - 20122 – Milano |
| • Course | Java and DataBase: from November 2017 to January 2018 |
| • Course | Basic of C/C++ programming: from February 2015 to April 2015 |
| • Name and address of employer | Fondazione Istituto Tecnico Superiore<br>Via del Convento, 1<br>24060 – San Paolo d'Argon (BG) |

## EDUCATION AND TRAINING

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| • Dates | AA 2023/2024 |
| • Activity | **Refresher courses:**<br>- Engaging Active Learning in the University Classroom<br>- Studenti DSA e studio delle materie scientifiche<br>- Strategie efficaci di comunicazione per l'orientamento<br>- Giornata di formazione dedicata all'orientamento attivo<br>- Giornata di formazione dedicata all'orientamento informativo |
| • Name and type of organization providing education and training | Università degli Studi di Bergamo<br>Viale Salvecchio, 19<br>24129 – Bergamo |
| • Dates | AA 2018/2019, AA 2019/2020, AA 2021/2022, AA 2022/2023 |
| • Activity | **English mediated instruction course: english course to teach in international courses** |
| • Name and type of organization providing education and training | Università degli Studi di Bergamo<br>Viale Salvecchio, 19<br>24129 – Bergamo |
| • Dates | October 2018 – May 2019 |
| • Activity | 1° edition of HC.LAB – Health Contamination Lab |
| • Name and type of organization providing education and training | Università degli Studi di Bergamo<br>Viale Salvecchio, 19<br>24129 – Bergamo |
| • Dates (from – to) | From January 2014 to December 2016 |
| • Name and type of organization providing education and training | Università degli Studi di Bergamo<br>Viale Salvecchio, 19<br>24129 – Bergamo |
| • Level in national classification | **PhD in Engineering and Applied Sciences** – Computer Engineering |
| • Thesis | Rigorous Model-based Development of Programmable Electronic Medical Systems *(PEMS): from Requirements to Code.* Supervisor: Prof. Angelo Gargantini |
| • Research topic | Area of Software Engineering: formal methods, abstract state machines, formal verification. Application for the diagnosis and treatment of amblyopia.<br>• 3D4AMB project (http://3d4amb.unibg.it/)<br>• *ASMETA project (http://asmeta.sourceforge.net/)*<br>• Medical software certification |
| • Courses attended | Microcontrollers, Design Interaction, Business Process Management, Active control of sound and vibration with practical application, Advanced data-driven methods for modelling, identification and control, Software Testing and Verification, Formal methods (ASM: Abstract State Machine), Languages and compilers<br>Summer school VTSA 2015: Verification Technology, Systems & Applications *(http://resources.mpi-inf.mpg.de/departments/rg1/conferences/vtsa15/)* |
| • Dates (from – to) | From September 2011 to December 2013 |
| • Name and type of organisation providing education and training | Università degli Studi di Bergamo<br>Viale Salvecchio, 19<br>24129 – Bergamo |
| • Title of qualification awarded | Computer Engineering (final mark 110 a honour/110) |
| • Level in national classification | Laurea magistrale |
| • Thesis | Modelling and simulation of a test-bench of aeronautical electromechanical actuators for the development of fault diagnosis methods. Supervisor: Prof. Fabio Previdi |

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| • Principal subjects | Industrial Electronics, Microelectronics, Automated Controls and Systems Identification and Data Analysis, Robotics, Mechatronic Systems, Object Oriented Software Design, Programming Languages, Theoretical Computer Science |
| • Dates (from – to) | From September 2008 to September 2011 |
| • Name and type of organisation providing education and training | Università degli Studi di Bergamo<br>Viale Salvecchio, 19<br>24129 – Bergamo |
| • Title of qualification awarded | Computer Engineering (final mark 95/110) |
| • Level in national classification | Bachelor degree |
| • Thesis | Automation of precise measurement of thermal woven properties (Automazione delle misure di precisione delle proprietà termiche dei tessuti). Supervisor: Prof. Giovanni Salesi |
| • Principal subjects | Software Engineering, Telecomunications Networks, Electronics, Industrial Control Systems, Automation, Java programming, C/C++ programming, Data Base and Web |
| • Dates (from – to) | From September 2003 to July 2008 |
| • Name and type of organisation providing education and training | Istituto Tecnico Commerciale G. Oberdan<br>Viale Merisio, 14<br>24047 - Treviglio (BG) |
| • Principal subjects/occupational skills covered | Economics, Maths, Computer Science<br>Reading, writing and interpretering various business documents<br>Managing the computer system - Participating in organizational work, individually and/or in groups, accepting and exercising coordination |
| • Title of qualification awarded | Commercial expert accountant and programmer (final mark 98/100) |
| • Level in national classification | High school certification |

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| **MOTHER TONGUE** | **ITALIAN** | |
| **OTHER LANGUAGES** | | |
| | **ENGLISH** | **FRENCH** |
| • Reading skills | Very Good | Basic |
| • Writing skills | Very Good | Basic |
| • Verbal skills | Very Good | Basic |

**INTERNATIONAL EXPERIENCE**

- Visiting at University of Arlington, Texas (February 2020)
- Visiting at University of Arlington, Texas (August 2018)
- Visiting period of six months at the international research center SCCH (Software Competence Centre Hagenberg) in Austria
- Presentation of works at international conferences

**PUBLICATIONS**

The update list of publication can be found here:
Scopus: https://www.scopus.com/authid/detail.uri?authorId=56901160800
Web of Science: https://www.webofscience.com/wos/author/record/AAD-9350-2019
Google Scholar: https://scholar.google.it/citations?user=rfnnQK8AAAAJ&hl=it

**ATTENDANCE/PRESENTATION AT THE FOLLOWING INTERNATIONAL CONFERENCES**

- FM 2024: *"ASMETA tool set for rigorous system design"*
- International Conference on Abstract State Machines, Alloy, B, TLA, VDM, and Z: presentation of the papers
  - *"Formal MVC: a pattern for the integration of ASM specifications in UI development" (2023)*
  - *"Modeling the MVM-Adapt System by Compositional I/O Abstract State Machines" (2023)*
  - *"Modelling an Automotive Software-Intensive System with Adaptive Features Using ASMETA"* (2021)
  - *"AsmetaA: Animator for Abstract State Machines"* (2018)
  - *"How to Assure Correctness and Safety of Medical Software: The Hemodialysis Machine*

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| | *Case Study"* (2016)<br>• International Conference on Health Informatics HEALTHINF:<br>o "A Mobile Application for Milano Ventilatore Meccanico: A First Prototype" (2022)<br>o "*Comparison of algorithms to measure a psychophysical threshold using digital applications: The stereoacuity case study*" (2021)<br>• The IEEE International Conference On Artificial Intelligence Testing, 2020,2021 (online)<br>• International Conference on Testing Software and Systems (ICTSS): presentation of the papers<br>o *"Automatic test generation with ASMETA for the Mechanical Ventilator Milano controller" (2021)*<br>o "*Validation of Transformation from Abstract State Machine Models to C++ Code*" (2018)<br>• 14th Workshop on Advances in Model Based Testing (A-MOST): presentation of the paper "*Generation of C++ Unit Tests from Abstract State Machines Specifications*" (2018)<br>• International Conference on Software Testing, Verification and Validation ICST (2017, 2021)<br>• 23rd European & Asian System, Software & Service Process Improvement & Innovation (EuroAsiaSPI2016): presentation of the paper "*A preliminary systematic literature review of the use of formal methods in medical software systems*" (2016)<br>• Workshop on ICTs for Improving Patients Rehabilitation Research Techniques: presentation of the paper *"A Low-cost Virtual Reality Game for Amblyopia Rehabilitation"* (2015)<br>• 10th joint meeting of ESEC and ACM sigsoft symposium on FSE (2015) |
| **CORRELATOR OF THE FOLLOWING MASTER'S THESIS** | • "Tracciabilità del prodotto e digitalizzazione dei processi nella filiera Olivicola – Olearia attraverso ERP ODOO", Tommaso Garbin, AA 2024/2025<br>• "EvoAvalla: Generazione di Scenari Astratti per Asmeta mediante Trasformazioni di codice e Generazione di Test JUnit", Isaac Maffeis, AA 2023/2024<br>• "BREATHE: A Respiratory System Simulator for Mechanical Ventilator Testing and Training", Alessandro Colombo and Gionatha Pirola, AA 2023/2024<br>• "Evaluating the Robustness of Bayesian Neural Networks by Exploiting Uncertainty Estimation", Wasim Essbai, AA 2022/2023<br>• "Paradigma autoadattativo per garantire runtime safety in sistemi critici", Davide Santandrea, correlatore esterno Università di Milano, AA 2021/2022<br>• "Traduzione di scenari per specifiche Abstract State Machines in casi di test JUnit", Alessio cicero, AA 2021/2022<br>• "Implementation of patient simulator for mechanical ventilation", Simona Piazzi, AA 2021/2022<br>• "Coevolution of test cases for Software Product Lines with evolving Feature Models", Luca Parimbelli, AA 2021/2022<br>• "Design e implementazione di un videogioco per la sensibilizzazione all'uso di internet nei giovani", Leonardo Tasca AA 2021/2022<br>• "Design e implementazione di un'app per monitorare l'uso dei social network nell'ambito del progetto Sicuri Online", Federico Modica, AA 2021/2022<br>• "Sviluppo di un Serious Game per la promozione di conoscenza e consapevolezza dei fondamenti della religione islamica", Davide Guido Bernasconi, AA 2020/2021<br>• "ASMs@run.time per la safety assurance dei sistemi software a runtime", Federico Rebucini, AA 2019/2020<br>• "Tecniche per il monitoraggio, tramite una rete neurale artificiale, della respirazione durante la ventilazione meccanica", Michele Piffari, AA 2019/2020<br>• "Modellazione e validazione del ventilatore polmonare MVM mediante le Abstract State Machines", Alessandro Gaiti, AA 2019/2020<br>• "Robustness evaluation of the estimation provided by a Multilayer Perceptron", Rita Pedercini, AA 2019/2020<br>• "Progettazione E Sviluppo Di Oko, Unsoftware Multipiattaforma Per la misurazione Dell'acutezza Visiva", Erica Maringoni, Jaspreet Singh, AA 2018/2019<br>• "Progettazione E Sviluppo Di Un Sistema Per Il Monitoraggio Del Paziente In Preabilitazione", Gianbattista Madaschi, AA 2017/2018<br>• "Progettazione e sviluppo di un servizio web per la somministrazione di questionari al fine della raccolta di esiti riferiti dal paziente", Andrea Gherardi, AA 2017/2018 |

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| | • "Generazione automatica del codice da Asmeta a Java", Denis Casati, AA 2017/2018<br>• "Reingegnerizzazione e traduzione in C++ mediante Xtext del linguaggio AValLa", Andrea Spalluzzi, AA 2016/2017<br>• "3D4Amb-ULib: una libreria di Unity per la terapia dell'ambliopia tramite VR games", Paolo Cattaneo, AA 2016/2017<br>• "CatchMe: una app per il gioco interattivo nello spazio virtuale per il trattamento dell'ambilopia con il cardboard.", Mattia Morotti, AA 2016/2017<br>• "AlienRun, un endless runner game multipiattaforma sviluppato con Intel XDK e Phaser per il progetto 3D4amb", Roberto Mazzola, AA 2016/2017<br>• "Automatic Code Generation from Formal Specification: UASM to C++ for Arduino", Marco Carissoni, AA 2015/2016<br>• "Un videogioco su realtà virtuale a basso costo per il trattamento dell'ambliopia", Terzi Fabio e Zambelli Matteo, AA 2014/15<br>• "Progettazione e sviluppo di una applicazione su piattaforma android per la misurazione dell'aniseiconia", Christian Tiomo Momo, AA 2014/15 |
| **REVIEWER OF PAPER FOR CONFERENCES/ JOURNALS** | Journals<br>• Journal of King Saud University - Computer and Information Sciences<br>• Journal of Systems and Software<br>• Journal of Software: Evolution and process<br>• Science of Computer Programming<br>• Informatics in Medicine Unlocked<br>• Multimedia Systems<br>• Information and Software Technology<br>• IEEE Transactions on Software Engineering Journal<br>• ACM Transactions on Software Engineering and Methodology (TOSEM)<br>Conferences<br>• ACM/SIGAPP Symposium On Applied Computing:<br>• AITest: IEEE Internationa Conference On Artificial Intelligence Testing<br>• ABZ International ABZ Conference ASM, Alloy, B, TLA, VDM, Z<br>• A-MOST: Workshop on Advances in Model Based Testing<br>• FASSI: Conference on Fundamentals and Advances in Software Systems Integration<br>• FAACS: Workshop on Formal Approaches for Advanced Computing Systems<br>• IWCFS: International Workshop on Cybersecurity and Functional Safety in Cyber-Physical Systems<br>• MEDI: Model and Data Engineering<br>• Spring Simulation Multi-Conference 2017<br>• FIT: 14th International Conference on Frontiers of Information Technology<br>• DIDAMATICA: Innovazione: sfida commune di scuola, università, ricerca e impresa<br>• HEALTHINF International Conference on Health Informatics<br>• EUROASIA SPI: 23rd European & Asian System, Software & Service Process Improvement & Innovation Conference |
| **PC MEMBER OF INTERNATIONAL CONFERENCES** | I am part of PC of several international conference on software engineering, testing and formal methods. |
| **CHAIR OF THE FOLLOWING CONFERENCES** | • ICTSS 2023, 2025: International Conference on Testing Software and Systems<br>• ABZ 2024 – Case study chair<br>• ABZ 2023 – Doctoral Symphosium: International Conference on Rigorous State Based Methods<br>• FAACS 2022, 2023: Workshop on Formal Approaches for Advanced Computing Systems |
| **PROJECTS** | • PRIN: SAFEST: Trust assurance of Digital Twins for medical cyber-physical systems: https://foselab.github.io/projects/Safest/<br>• MVM-Adapt: https://foselab.github.io/projects/MVM_Adapt/<br>• Sicuri online: progettazione e sviluppo di una tecnologia in grado di monitorare i ragazzi online, rendendoli responsabili e consapevoli dei pericoli del web. |

- FISR2020 – Adaptive Mechanical Ventilator Milano under Uncertainty
- Machine learning algorithms: quality assurance
- MVM: Mechanical Ventilator Milano http://mvm.care/
- Quasmed: analyse different factors to guarantee the good quality of software: https://foselab.github.io/projects/QUASMED/
- Medical software certification: compliance with international standards
- SE4Med: aims at developing software for health monitoring
  Prehabilitation Fit: monitor patients in the prehabilitation phase using a fitness tracker
  Patient Reported Outcome: create a platform to send online patient questionnaires
- ASMETA: metamodel for the Abstract State Machines (ASMs) formal method developed by following the guidelines of the Model-Driven Engineering (MDE) (*http://asmeta.sourceforge.net/*)
- 3D4AMB: aims at developing a system based on the 3D for the diagnosis and treatment of amblyopia in young children
- Hours of Code 2016, 2019
- Visual servoing: identification of images placed on a moving disk (2013)
- Pioneer: development of an algorithm which allows the Pioneer robot to reach a defined end point (2012)
- Management software of buldings and areas of municipality: Software that allows municipality to manage buldings rent, sports centers rent and other municipality properties (2012).
- Co-organization and management of the laboratory "Usiamo lo smartphone per vederci meglio" during Bergamoscienza festival (*https://www.bergamoscienza.it/it*) in 2015 and 2017

Autorizzo il trattamento dei miei dati personali presenti nel cv ai sensi del Decreto Legislativo 30 giugno 2003, n. 196 "Codice in materia di protezione dei dati personali" e del GDPR (Regolamento UE 2016/679).

03/01/2026

SILVIA BONFANTI