Vincenzo **Arceri**

Assistant Professor

University of Parma, Parco Area delle Scienze, 53/A, 43124 - Parma (PR), Italy

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Career

Assistant Professor

Parma, Italy

University of Parma — *From Sep. 2021*

- Research: abstract interpretation, static analysis of blockchain smart contract written in Go, relational string analysis, static analysis of unsafe Rust, design and implementation of LiSA, a Library for Static Analysis, static analysis for LLM-generated code, design end implementation of EVMLiSA, an abstract interpretation-based static analyzer for EVM bytecode
- Teaching: Fundamentals of Programming within the Computer Science B.Sc. in University of Parma (15 CFU, 120 hours of lectures, 1st year)

Postdoctoral Researcher

Venice, Italy

Ca' Foscari University of Venice — *Sep. 2020 - Sep. 2021*

- Research project: Development of a generic static analyzer for Go
- Project coordinator: Prof. Agostino Cortesi
- The goal of this research project is the study and the development of a parametric static analyzer based on abstract interpretation for Golang, within the context of smart contracts and Cosmos SDK decentralized applications. Within the FSE research project "Progetto, sviluppo e validazione di sistemi blockchain per l'e- commerce" 2120-0002-1463-2019 in collaboration with Corvallis S.p.a., Commerc.io S.r.l. and Alpenite S.r.l..
- Teaching: Introduction to coding and data management - Practice (module 2) within the Digital Management B.Sc. in University Ca' Foscari of Venice (10 hours of lectures, 1st year, academic year 2021-2022)

Postdoctoral Researcher

Venice, Italy

Ca' Foscari University of Venice — *Sep. 2019 - Sep. 2020*

- Research project: Software integrated framework for IoT applications in Smart Cities scenarios
- Project coordinator: Prof. Agostino Cortesi
- The objective of this research project was to study new formal techniques for static analysis of strings. In particular, the research work done during this period can be split in three main topics: measure the precision increment of existing non-relational string analysis for dynamic languages, study of the precision/efficiency trade- off new string analyses and the development of a generic framework for the generation of relational string analyses.

Education

University of Verona

Verona, Italy

PhD in Computer Science — *Oct. 2016 - May 2020*

Thesis: "Taming Strings in Dynamic Languages - An Abstract Interpretation-based Static Analysis Approach".
Advisor: Prof. Isabella Mastroeni
External Reviewers: Prof. Sergio Maffeis and Prof. Xavier Rival
Defence committee members: Prof. Roberto Bruni, Prof. Sergio Maffeis, Prof. Isabella Mastroeni
Defended: 18 May 2020

University of Verona

Verona, Italy

Master Degree in Computer Science — *Oct. 2014 - Jul. 2016*

Grade: 110/110 cum laude
Subject: "PHP Type Static Analysis by Abstract Interpretation".
Advisor: Prof. Isabella Mastroeni

University of Verona

Verona, Italy

Bachelor Degree in Computer Science — *Oct. 2011 - Jul. 2014*

Grade: 105/110
Thesis: Una tecnica di analisi semantica per JavaScript: la separation logic
Advisor: Prof. Isabella Mastroeni

Research Interests

My research interests are focused on the application of the abstract interpretation framework for improving the security, reliability and correctness of software by means of sound static program analysis.

Currently, my main research activities include the design and development of static analysis-based approaches to improve the quality of the LLM-generated code, new static analyses for general-purpose and domain-specific languages cross-blockchain applications, and formal techniques for improving the classical approach adopted in static analysis via abstract interpretation, both from the precision and performance point of view.

Keywords: abstract interpretation, static analysis, dynamic languages, software engineering, program verification

Awards, Honors and Fellowships

Oct. 2025	**Invited to Dagstuhl Seminar 25421**, *"Sound Static Program Analysis in Modern Software Engineering"*	*Wadern, Germany*
Jul. 2023	**Invited to Dagstuhl Seminar 23281**, *"Theoretical Advances and Emerging Applications in Abstract Interpretation"*	*Wadern, Germany*
Jul. 2023	**INdAM GNCS Funding**, for participation in schools, workshops, seminars and conferences (600€)	*Parma, Italy*
Oct. 2019	**Best Paper Award**, VALID 2019, *"Towards an Operational Semantics for Solidity"* M. Crosara, G. Centurino, V. Arceri	*Valencia, Spain*
Aug. 2018	**Scholarship**, Marktoberdorf Summer School (Engineering Secure and Dependable Software Systems)	*Marktoberdorf, Germany*

Publications

Editorships

[e4] A. Cortesi, V. Arceri, D. Novarun, N. Chacki: *"Software Specification and Verification: Models and Tools ",* Special issue of Frontiers in Computer Science, 2025 (https://www.frontiersin.org/research-topics/68142/software-specification-and-verification-models-and-tools)

[e3] V. Arceri, P. Ferrara, L. Negrini, L. Olivieri: *"Challenges of Software Verification",* Special issue of the International Journal on Software Tools for Technology Transfer, 2024, volume 26, issue 6 (https://link.springer.com/article/10.1007/s10009-024-00778-7)

[e2] P. Ferrara, A. Cortesi, V. Arceri: *"Challenges of Software Verification",* Special section of the International Journal on Software Tools for Technology Transfer, volume 26, issue 4, 2024 (link: https://link.springer.com/journal/10009/volumes-and-issues/26-4)

[e1] V. Arceri, A. Cortesi, P. Ferrara, M. Olliaro: *"Challenges of Software Verification",* Intelligent Systems Reference Library, 238, Springer Singapore, 2023, ISBN: 978-981-19-9601-6 (doi: 0.1007/978-981-19-9601-6)

Journals

[j15] G. Dolcetti, V. Arceri, A. Mensi, E. Zaffanella, C. Urban, A. Cortesi: *"Pyra: A High-level Linter for Data Science Software",* Knowledge-Based Systems, Volume 337, 2026, 115412, ISSN 0950-7051 (doi: 10.1016/j.knosys.2026.115412)

[j14] V. Arceri, F. Bianchi, G. Dolcetti, E. Zaffanella: *" Faster numeric static analyses with unconstrained variable oracles",* PeerJ Computer Science 11:e3390 (doi: 10.7717/peerj-cs.3390)

[j13] V. Arceri, S. M. Merenda, L. Negrini, L. Olivieri, E. Zaffanella: *"EVMLiSA: Sound Static Control-Flow Graph Construction for EVM Bytecode",* Blockchain: Research and Applications, 2025 (doi: 10.1016/j.bcra.2025.100384)

[j12] V. Arceri, L. Negrini, L. Olivieri, P. Ferrara: *"Challenges of software verification",* International Journal on Software Tools for Technology Transfer, 2025 (doi: 10.1007/s10009-024-00778-7)

[j11] L. Olivieri, V. Arceri, B. Chachar, L. Negrini, F. Tagliaferro, F. Spoto, P. Ferrara, A. Cortesi: *"General-purpose Languages for Blockchain Smart Contracts Development: A Comprehensive Study",* IEEE Access, vol. 12, 2024 (10.1109/ACCESS.2024.3495535)

[j10] P. Ferrara, V. Arceri, A. Cortesi: *"Challenges of software verification: the past, the present, the future",* International Journal on Software Tools for Technology Transfer, 2024 (doi: 10.1007/s10009-024-00765-y)

[j9] V. Arceri, G. Dolcetti, E. Zaffanella: *"Speeding up static analysis with the split operator",* International Journal on Software Tools for Technology Transfer, 2024 (doi: 10.1007/s10009-024-00761-2)

[j8] L. Olivieri, L. Negrini, V. Arceri, B. Chachar, P. Ferrara, A. Cortesi: *"Detection of Phantom Reads in Hyperledger Fabric",* IEEE Access, vol. 12, 2024 (doi: 10.1109/ACCESS.2024.3410019)

[j7] L.Olivieri, L. Negrini, V. Arceri, T. Jensen, F. Spoto: *"Design and Implementation of Static Analyses for Tezos Smart Contracts",* Distributed Ledger Technologies, 2024 (doi: 10.1145/3643567)

[j6] L. Negrini, V. Arceri, A. Cortesi, P. Ferrara: *"Tarsis: an effective automata-based abstract domain for string analysis",* In Journal of Software: Evolution and Process, 2024 (doi: 10.1002/smr.2647)

[j5] L. Olivieri, L. Negrini, V. Arceri, F. Tagliaferro, P. Ferrara, A. Cortesi, F. Spoto: *"Information Flow Analysis for Detecting Non-Determinism in Blockchain (Artifact)",* Dagstuhl Artifacts Ser. 9(2): 23:1-23:3 (2023) (doi: 10.4230/DARTS.9.2.23)

[j4] V. Arceri, M. Olliaro, A. Cortesi, I. Mastroeni: *"Completeness of String Analysis for Dynamic Languages",* Information and Computation 104791, 2021 (doi: 10.1016/j.ic.2021.104791)

[j3] V. Arceri, I. Mastroeni: *"Analyzing Dynamic Code: A Sound Abstract Interpreter for evil eval",* ACM Transactions on Privacy and Security (TOPS) Volume 24, Number 2 ,2021 (doi: 10.1145/3426470)

[j2] V. Arceri, I. Mastroeni, S. Xu: *"Static Analysis for ECMAScript String Manipulation Programs",* Applied Science, 2020, 10(10), 3525, 2020 (doi: 10.3390/app10103525)

[j1] V. Arceri, S. Maffeis: *"Abstract Domains for Type Juggling",* Electronic Notes in Theoretical Computer Science, Volume 331, 41-55, 2017 (doi: 10.1016/j.entcs.2017.02.003)

International conferences and workshops

[c22] V. Arceri, L. Negrini, G. Zanatta, F. Bianchi, T. Lisovenko, L. Olivieri and P. Ferrara: *"JLiSA: the Java frontend of the Library for Static Analysis (Competition Contribution)",* To appear in proceedings of the 32nd International Conference on Tools and Algorithms for the Construction and Analysis of Systems, TACAS 2026

[c21] G. Dolcetti, V. Arceri, A. Mensi, E. Zaffanella, C. Urban, A. Cortesi: *"Introducing Pyra: A High-level Linter for Data Science Software",* Machine Learning and Knowledge Discovery in Databases. Applied Data Science Track and Demo Track. ECML PKDD 2025 (doi: 10.1007/978-3-032-06129-4_29)

[c20] G. Dolcetti, V. Arceri, A. Cortesi, E. Zaffanella: *"On the Verification of ML Systems and Models",* In proceedings of the 7th International Workshop on Artificial Intelligence and fOrmal VERification, Logic, Automata, and sYnthesis, OVERLAY 2025 @ ECAI 2025

[c19] L. Olivieri, L. Negrini, V. Arceri, P. Ferrara, A. Cortesi: *"Detection of Read-Write Issues in Hyperledger Fabric Smart Contracts",* In Proceedings of the 40th ACM/SIGAPP Symposium On Applied Computing, ACM/SIGAPP SAC 2025 (doi: 10.1145/3672608.3707721)

[c18] L. Olivieri, L. Negrini, V. Arceri, P. Ferrara, A. Cortesi, F. Spoto: *"Static Detection of Untrusted Cross-Contract Invocations in Go Smart Contracts",* In Proceedings of the 40th ACM/SIGAPP Symposium On Applied Computing, ACM/SIGAPP SAC 2025 (doi: 10.1145/3672608.3707728)

[c17] L. Negrini, V. Arceri, L. Olivieri, A. Cortesi, P. Ferrara: *"Teaching through Practice: Advanced Static Analysis with LiSA",* In Proceedings of the 6th Formal Methods Teaching Workshop, FMTea 2024 (doi: 10.1007/978-3-031-71379-8_3)

[c16] V. Arceri, S. M. Merenda, L. Negrini, L. Olivieri, G. Dolcetti, E. Zaffanella: *"Towards a Sound Construction of EVM Bytecode Control-flow Graphs",* In Proceedings of the 26th International Workshop on Formal Techniques for Java-like Programs, FTfJP 2024 (doi: 10.1145/3678721.3686227)

[c15] V. Arceri, G. Dolcetti, E. Zaffanella: *"Unconstrained Variable Oracles for Faster Static Analyses",* In Proceedings of the 30th Static Analysis Symposium, SAS 2023 (doi: 10.1007/978-3-031-44245-2_5)

[c14] L. Olivieri, L. Negrini, V. Arceri, F. Tagliaferro, P. Ferrara, A. Cortesi, F. Spoto: *"Information Flow Analysis for Detecting Non-Determinism in Blockchain",* 37th European Conference on Object-Oriented Programming, ECOOP 2023 (doi: 10.4230/LIPIcs.ECOOP.2023.23)

[c13] G. Boldini, A. Diana, V. Arceri, V. Bonnici, R. Bagnara: *"A Machine Learning Approach for Source Code Similarity via Graph-focused Features",* In Proceedings of the 9th International Conference on Machine Learning, Optimization, and Data Science (LOD 2023) (10.1007/978-3-031-53969-5_5)

[c12] V. Arceri, G. Dolcetti, E. Zaffanella: *"Speeding up Static Analysis with the Split Operator",* Proceedings of the 12th ACM SIGPLAN International Workshop on the State Of the Art in Program Analysis (SOAP 2023) (https://dl.acm.org/doi/10.1145/3589250.3596141)

[c11] V. Bonnici, V. Arceri, A. Diana, F. Bertini, E. Iotti, A. Levante, V. Bernini, E. Neviani, A. Dal Palù: *"BIOCHAIN: towards a platform for securely sharing microbiological data",* Proceedings of the 27th International Database Engineered Applications Symposium Conference (IDEAS 2023) (doi: 10.1007/978-3-031-21037-2_2)

[c10] V. Arceri, I. Mastroeni, E. Zaffanella: *"Decoupling the ascending and descending phases in Abstract Interpretation",* Proceedings of the 20th Asian Symposium on Programming Languages and Systems (APLAS 2022) (doi: 10.1145/3589462.3589501)

[c9] L. Olivieri, F. Tagliaferro, V. Arceri,, M. Ruaro, L. Negrini, A. Cortesi, P. Ferrara, F. Spoto, E. Talin: *"Ensuring Determinism in Blockchain Software with GoLiSA: An Industrial Experience Report",* Proceedings of the 11th ACM SIGPLAN International Workshop on the State of the Art in Program Analysis (SOAP 2022) (doi: 10.1145/3520313.3534658)

[c8] V. Arceri, M. Olliaro, A. Cortesi, P. Ferrara: *"Relational String Abstract Domains",* Proceedings of the 23th International Conference on Verification, Model Checking, and Abstract Interpretation (VMCAI 2022) (doi: 10.1007/978-3-030-94583-1_2)

[c7] P. Ferrara, L. Negrini, V. Arceri, A. Cortesi: *"Static Analysis for Dummies: Experiencing LiSA",* Proceedings of the 10th ACM SIGPLAN International Workshop on the State of the Art in Program Analysis (SOAP 2021) (doi: 10.1145/3460946.3464316)

[c6] I. Mastroeni, V. Arceri: *"Improving Dynamic Code Analysis by Code Abstraction",* Proceedings of the 9th International Workshop on Verification and Program Transformation (VPT 2021) (doi: 10.4204/EPTCS.341.2)

[c5] L. Negrini, V. Arceri, P. Ferrara, A. Cortesi: *"Twinning Automata and Regular Expressions for String Static Analysis",* Proceedings of the 22th International Conference on Verification, Model Checking, and Abstract Interpretation (VMCAI 2021) (doi: 10.1007/978-3-030-67067-2_13)

[c4] V. Arceri, I. Mastroeni: *"A Sound Abstract Interpreter for Dynamic Code",* Proceedings of 35th ACM/SIGAPP Symposium On Applied Computing (SAC 2020) (doi: 10.1145/3341105.3373964)

[c3] V. Arceri, M. Pasqua, I. Mastroeni: *"An Abstract Domain for Objects in Dynamic Programming Languages",* Proceedings of 8th International Workshop on Numerical and Symbolic Abstract Domains (NSAD 2019) (doi: 10.1007/978-3-030-54997-8_9)

[c2] V. Arceri, M. Olliaro, A. Cortesi, I. Mastroeni: *"Completeness of Abstract Domains for String Analysis of JavaScript Programs",* Proceedings of 16th International Colloquium of Theoretical Aspects of Computing (ICTAC 2019) (doi: 10.1007/978-3-030-32505-3_15)

[c1] V. Arceri, I. Mastroeni: *"Static Program Analysis for String Manipulation Languages",* Proceedings of the 7th International International Workshop on Verification and Program Transformation (VPT 2019) (doi: 10.4204/EPTCS.299.5)

Book chapters

[b3] L. Negrini, V. Arceri, P. Ferrara, A. Cortesi: *"LiSA: A Generic Framework for Multilanguage Static Analysis",* In Challenges of Software Verification. Intelligent Systems Reference Library, vol 238. Springer, Singapore, 2023 (doi: 10.1007/978-981-19-9601-6_2)

[b2] E. Zaffanella, V. Arceri: *""Fixing" the Specification of Widenings",* In Challenges of Software Verification. Intelligent Systems Reference Library, vol 238. Springer, Singapore, 2023 (doi: 10.1007/978-981-19-9601-6_4)

[b1] M. Olliaro, V. Arceri, A. Cortesi, P. Ferrara: *"Lifting String Analysis Domains",* In Challenges of Software Verification. Intelligent Systems Reference Library, vol 238. Springer, Singapore, 2023 (doi: 10.1007/978-981-19-9601-6_7)

PhD Thesis

[t1] V. Arceri: *"Taming Strings in Dynamic Languages – An Abstract Interpretation-based Static Analysis Approach",* PhD thesis defended at University of Verona on May 18, 2020

Community Service

2026 **Program Committee member**, ACSS 2026, 13th International Symposium on Applied Computing for Software and Smart Systems

2026 **Program Committee member**, SOAP 2026, 15th ACM SIGPLAN International Workshop on the State of the Art in Program Analysis

2025 **Co-Program Chair**, GeCoIn 2025, 1st Generative Code Intelligence workshiop, co-located with ECAI 2025 (https://gecoin-workshop.github.io/)

2025 **Co-Program Chair**, CSV 2025, 4th Challenges of Software Verification symposium

2025 **Guest Editor**, Special issue "Recent Advances in Smart Contract and Blockchain Analysis" of Information

2025 **Guest Editor**, Special issue "Software Specification and Verification: Models and Tools" of Frontiers in Computer Science

2025 **Guest Editor**, Special issue "Challenges of software verification" of International Journal on Software Tools for Technology Transfer

2025 **Artifact Evaluation Committee member**, OOPSLA 2025, Conference on Object-Oriented Programming, Systems, Languages, and Applications

2025 **Reviewer**, TACAS 2025, 31st International Conference on Tools and Algorithms for the Construction and Analysis of Systems

2025 **Artifact Evaluation Committee member**, POPL 2025, 52nd ACM SIGPLAN Symposium on Principles of Programming Languages

2024 **Guest Editor**, Special issue "Challenges of software verification" of International Journal on Software Tools for Technology Transfer

2024 **Co-Program Chair**, NSAD 2024, 10th ACM SIGPLAN International Workshop on Numerical and Symbolic Abstract Domains

2024 **Program Committee member**, FTfJP 2024, 26th International Workshop on Formal Techniques for Java-like Programs

2024 **Guest Editor**, Special section "Challenges of software verification" of International Journal on Software Tools for Technology Transfer, volume 26, issue 4

2024 **Organizer and Part of the Scientific Committee**, Lipari Summer School on Abstract Interpretation (https://absint24.liparischool.it/)

2024 **Co-Program Chair**, CSV 2024, 3rd Challenges of Software Verification symposium

2024 **Program Committee member**, DATA ANALYTICS 2024, 13th International Conference on Data Analytics

2024 **Program Committee member**, VALID 2024, 16th International Conference on Advances in System Testing and Validation Lifecycle

2023 **Program Committee member**, DBKDA 2023, 16th International Conference on Advances in Databases, Knowledge, and Data Applications

2023 **Program Committee member**, VALID 2023, 15th International Conference on Advances in System Testing and Validation Lifecycle

2023 **Session Chair**, SOAP 2023, 12th ACM SIGPLAN International Workshop on the State of the Art in Program Analysis (Static analysis track)

2023 **Artifact Evaluation Committee member**, SAS 2023, 30th Static Analysis Symposium

2023 **Reviewer**, SAS 2023, 30th Static Analysis Symposium

2023 **Reviewer**, KSEM 2023, 16th International Conference on Knowledge Science, Engineering and Management

2023 **Co-Program Chair**, CSV 2023, 2nd Challenges of Software Verification symposium

2023 **Program Committee member**, SOAP 2023, 12th ACM SIGPLAN International Workshop on the State of the Art in Program Analysis

2023 **Program Committee member**, LOD 2023, 9th International Conference on Machine Learning, Optimization, and Data Science

2023 **Main Editor**, Challanges of Software Verification, part of the book series Intelligent Systems Reference Library (volume 238), Springer-Nature, `https://link.springer.com/book/9789811996009`

2023 **Program Committee member**, Special Session on "Privacy and Data Protection", ICCCI 2023, 15th International Conference on Computational Collective Intelligence

2022 **Co-Program Chair**, CSV 2022, 1st Challenges of Software Verification workshop, organized on the occasion of the award ceremony of the Doctorate Honoris Causa in Computer Science at Ca' Foscari University of Venice to Professor Patrick Cousot

2022 **Reviewer**, SAS 2022, 29th Static Analysis Symposium

2022 **Artifact Evaluation Committee member**, SAS 2022, 29th Static Analysis Symposium

2022 **Reviewer**, CISIM 2022, 21th International Conference on Computer Information Systems and Industrial Management Applications

2022 **Program Committee member**, VALID 2022, 14th International Conference on Advances in System Testing and Validation Lifecycle

2022 **Session Chair**, VMCAI 2022, 23rd International Conference on Verification, Model Checking, and Abstract Interpretation (Privacy & Security track)

2021 **Program Committee member**, VALID 2021, 13th International Conference on Advances in System Testing and Validation Lifecycle

2019 **Reviewer**, VALID 2019, 11th International Conference on Advances in System Testing and Validation Lifecycle

2018 **Reviewer**, ESOP 2018, 27th European Symposium on Programming

2016 **Reviewer**, SSPREW 2016, 6th Software Security, Protection, and Reverse Engineering Workshop

Reviewer for the following journals:

- **IEEE Transactions on Dependable and Secure Computing** (2026)
- **The Journal of Supercomputing** (2026)
- **ACM Transactions on Programming Languages and Systems** (2025)
- **ACM Transactions on Software Engineering and Methodology** (2025)
- **Blockchain: Research and Applications** (2025)
- **International Journal of Computer Theory and Engineering** (2025)
- **Entropy** (2025)
- **Computers, Materials and Continua** (2025)
- **International Journal on Software Tools for Technology Transfer** (2024)
- **Applied Sciences** (2024)
- **Future Internet** (2024)
- **Computers** (2024)
- **Electronics** (2024)
- **Blockchains** (2024)
- **Symmetry** (2023)
- **Journal of Network and Computer Applications** (2021)

Editorial boards

- Member of the Editorial Board of Discover Computing, Springer (formerly Information Retrieval Journal), ISSN 2948-2992

  (`https://link.springer.com/journal/10791`)

- Member of the Editorial Board of the International Journal on Advances in Software (`https://www.iariajournals.org/software`)

Membership organizations

From 2021 **GRIN**, GRuppo di INformatica
2021 - 2025**GNCS**, Gruppo Nazionale per il Calcolo Scientifico – IndAM

Grants

Principal Investigator, "LLMs meet Static Analysis: a large-scale evaluation of LLM-generated code"

ISCRA project (class B), Cineca — *From Jan. 2025*

The goal of this project is to investigate the ability of some recently advanced Artificial Intelligence (AI) chat-bots to generate code. The technologies behind those chat-bots are known as Large Language Models (LLMs). One of the most famous and hyped examples of LLM is ChatGPT developed by OpenAI, which, thanks to its ability to mimic human writing in a very credible way on a wide range of tasks, quickly caught the attention of many people, including researchers. Due to its success, many other chatbots have surfaced in the AI landscape. One of the most requested tasks is to write code for software development, which is emerging as a useful and practical evolution for developers, to speed up and simplify the production of code. Despite the wide diffusion of new LLM-based solutions for coding purposes, there are some significant concerns. These models work in a very complex way, so it is hard to understand exactly how they make decisions or create text. Even if we can see LLMs as black-boxes that are good enough at mimicking human writing, it has been shown that they are not as good when it comes to writing software. The code they generate often contains bugs and vulnerabilities, which are frequently overlooked by the users. This project aims to thoroughly check the quality and safety of the code these models produce. To achieve this, we will use techniques that can automatically identify issues in the code without having to run it or involve human interaction. This collection of techniques is known as Static Analysis (SA). Once we identify these problems, we will investigate if the models are capable of fixing them by themselves: we plan to exploit the results of the SA to provide feedback to these chat-bots, asking them to correct their code and producing a new version without bugs. Another interesting and challenging problem is to check if the code produced by LLMs matches what the user asked for; in a sentence, we aim to check if "what you prompt is what you get". The outcomes of this project could potentially lead to improvements in how these models are trained and used, making them more reliable and safe for generating code. This could contribute to improving the standards for automated code writing, ensuring a higher level of software quality.

Co-Principal Investigator, "LLMs meet Static Analysis: a large-scale evaluation of LLM-generated code" — *€ 14'580*

Bando di Ateneo 2024 della Ricerca, University of Parma — *From Sept. 2024*

Principal investigator: Prof. Eleonora Iotti. Large Language Models (LLMs) have been proposed as one of the most promising developments in the field of Artificial Intelligence (AI) and the software engineering community has immediately been aware of their potential role in the software development life-cycle. While many studies have been conducted to uncover general vulnerabilities of these models, such as training data poisoning or sensitive data leakage, fewer investigations aimed at evaluating the quality and safety of the output of LLMs when it concerns source code generation. Still, the existing preliminary studies highlight how the LLM-generated code is usually not safe, being affected by bugs and code smells: in fact, LLMs seem able to mimic human natural language writing much better than they can write software code like human developers. The goal of this project is to conduct an extensive quality and safety evaluation of the code generated by some representative and selected LLMs, employing Static Analysis (SA) techniques that can detect vulnerabilities and run-time errors statically and automatically, i.e., without executing the code and without human interactions. Once we identify the vulnerabilities occurring in the generated code, we investigate whether the LLMs can effectively correct them. Thus, we provide the LLMs with detailed feedback regarding the detected vulnerabilities and ask them to correct the vulnerabilities present in the previously generated code. Additionally, we will focus on inspecting LLM-generated code's compliance with the user's prompt, investigating if the LLM-proposed code aligns with the user specifications; in a sentence, we investigate if "what you prompt is what you get". The key idea of this project is to integrate SA with LLM capabilities aiming at not only exposing and highlighting the limitations of current models but also testing their capacity for self-correction. The findings arising from this project will significantly contribute to the ongoing discourse in software engineering about the reliance on LLMs for code generation, potentially driving improvements in model training methodologies and affecting the development of more robust and secure LLMs. This could lead to safer, more reliable software development practices, and elevate the standard of automated code generation.

Principal Investigator, "LLMs meet Static Analysis: improving quality and reliability of AI-generated code"

ISCRA project (class C), Cineca — *Jan. 2024 - Dec. 2024*

The goal of the project is to conduct an extensive quality and safety evaluation of the code generated with some of the most popular and open-source LLMs employing static analyzers, that can detect vulnerabilities and run-time errors statically, without executing the code. Once this information is available, it will be included in the code-generation task, to guide the LLM itself to produce a more precise and safe output, in which static analysis is somehow introduced in the pipeline of the code-generation task.

Principal Investigator, "Formal verification of GPLs blockchain smart contracts" *€ 12'000*

Bando di Ateneo 2022 della Ricerca, University of Parma *From Mar. 2023*

The goal of this project is to provide a prototype of a generic static analyzer for verifying GPLs blockchain smart contracts. We will base our approach on abstract interpretation, a formal theoretical framework for reasoning about program semantic properties of interest. Unlike more popular techniques based on dynamic analyses, our approach allows us to come up with a sound static analyzer, i.e., none of the possible executions of the smart contract of interest will be neglected when analyzing it. Informally speaking: "If no bugs or vulnerabilities are found on a given smart contract, surely the smart contract has no bugs".

Technical head, "BIOCHAIN-AI: a platform for securely sharing and analysing microbiological data" *€ 9'000*

Bando di Ateneo 2021 della Ricerca, University of Parma *Jul. 2022 - Jul. 2023*

Principal investigator: Prof. Vincenzo Bonnici. This project aims at providing a prototype platform for managing biological knowledge, in particular data regarding microbial species, to be used by a consortium of public and private entities having the need of sharing their data and integrating their knowledge for gaining advantages by federated machine learning analyses. Members of the consortium share data under specific law agreements that must be traced in the digital world. For this reason, the proposed system relies on a blockchain-based security layer, able to immutably store the transaction history by all the member of the consortium.

Research Participant (involved in workpackages 1 and 4), "ARES: Analyzing secuRity in modErn Software" *€ 44'000*

Progetto Ricerca di Base 2017, University of Verona *2017 - 2019*

Principal investigator: Prof. Isabella Mastroeni. Security is an enabling technology, hence security means power. Nowadays, in the era of Industry 4.0, this power is becoming more and more critical, since almost every phase of any production chain exploits Information Technology (IT) systems, which, if not adequately protected, may open dramatic security breaches. One pillar of any IT infrastructure is connection, everything is connected to the network, and this makes the network, and therefore anything used through it (e.g., cloud computing), a potential vehicle of attack. According to OWASP (Open Web Application Security Project), the most critical security risks on the web have been application level injection attacks for almost a decade, and still remain among the most critical web vulnerabilities. Hence, our task is to build sound-by-construction technologies aiming at improving the security degree of the web. We tackle the problem from two points of view: We aim at designing robust IT systems (secure-by-design) and we aim at successfully facing existing attack methodologies. In order to enforce security for both these two faces of the same coin, we propose new technologies able to face the emerging challenges due to modern dynamic languages, that, while providing features that simplify writing programs, allow statically unpredictable executions (critical when analyzing software), and make programs harder to understand (critical when analyzing malware). In particular, we aim at tackling two main challenges: The design of new static analysis techniques overcoming the obstacles due to dynamic features and/or combination of different languages; The design of new verification models for revealing information flow vulnerabilities, namely those vulnerabilities opening code injection, XSS and other similar security breaches on the web. These two directions of work must then converge in an innovative technology allowing us to soundly analyze information flows in modern (dynamic and/or multi-language) software.

Institutional Responsabilities

From Nov. 2021	**Responsible for students orientation**, Responsible for the prospective students' orientation for the Bachelor Degree Programme in Computer Science	*University of Parma*
From Nov. 2021	**Responsible for students orientation**, Responsible for the prospective students' orientation for the Master Degree Programme in Computer Science	*University of Parma*
From Nov. 2021	**Delegate for academic tutoring**, Delegate for academic tutoring for the Bachelor Degree Programme in Computer Science	*University of Parma*
From Nov. 2021	**Delegate for academic tutoring**, Delegate for academic tutoring for the Master Degree Programme in Computer Science	*University of Parma*
From Nov. 2021	**Member**, Teaching committee, Bachelor Degree Programme in Computer Science	*University of Parma*
From Nov. 2021	**Member**, Teaching committee, Master Degree Programme in Computer Science	*University of Parma*

Previous istitutional responsabilities

2021 - 2023	**PLS Coordinator**, Coordinator of the PLS (Piano Lauree Scientifiche) programme for Computer Science	*University of Parma*
2022	**Ragazze Digitali Parma 2022 Scientific Head**, Scientific head of Ragazze Digitali Parma 2022, a three weeks summer camp on programming dedicated to women high school students, with the aim of facing the digital gender gaps	*University of Parma*

Third-party Research Collaboration

Qualification of existing software for application in safety-critical systems *€42'000.*

Dec. 2024 - Dec. 2025

Scientific coordinator of a research project commissioned by BUGSENG Srl and funded through a third-party agreement with the University of Parma. The project, titled "Qualification of existing software for application in safety-critical systems", focuses on the design of methodologies and tools to evaluate and adapt pre-existing software for compliance with functional safety and cybersecurity standards. The activity is formally recognized and compensated under contract between BUGSENG Srl and University of Parma with a total budget of €42'000.

Internships

UROP Trainee *London, United Kingdom*

Imperial College London *Jun. 2016 - Sep. 2016*

Undergraduate Reseach Opportunities Programme
Static analysis of PHP type juggling
Advisor: Prof. Sergio Maffeis

Temporary Research Fellow *Verona, Italy*

University of Verona *Dec. 2015 - Feb. 2016*

Static analysis by abstract interpretation for μPHP, an imperative core of PHP, with $\mathbb{K}$ framework
Advisor: Prof. Isabella Mastroeni

Tools and Software

EVMLiSA: an abstract interpretation-based static analyzer for EVM bytecode

From Jan. 2024

EVMLiSA is a static analyzer based on abstract interpretation for EVM bytecode of smart contracts deployed on Ethereum blockchain and built upon LiSA. Given a EVM bytecode smart contract, EVMLiSA builds a sound and precise control-flow graph of the smart contract. EVMLiSA is maintained by University of Parma, Italy, and it is available on Github (`https://github.com/lisa-analyzer/evm-lisa`).

LiSA: a Library for Static Analysis

From Sep. 2020

LiSA (Library for Static Analysis) eases the creation and implementation of static analyzers based on the Abstract Interpretation theory. LiSA provides an analysis engine that works on a generic and extensible control flow graph representation of the program to analyze. Abstract interpreters in LiSA are built for analyzing such representation, providing a unique analysis infrastructure for all the analyzers that will rely on it. Building an analyzer upon LiSA boils down to writing a parser for the language that one aims to analyze, translating the source code or the compiled code towards the control flow graph representation of LiSA. Then, simple checks iterating over the results provided by the semantic analyses of LiSA can be easily defined to translate semantic information into warnings that can be of value for the final user. LiSA is maintained by the Software and System Verification group @ Ca' Foscari University of Venice, Italy, and it is distributed under the MIT license, and it is available on GitHub (`https://github.com/lisa-analyzer/lisa`).

Tarsis: an improved finite-state automata-based string abstract domain

From Mar. 2020

Tarsis is a new abstract domain for string values based on finite state automata. Standard finite state automata abstract domain has been shown to provide precise abstractions of string values when all the components of such strings are known, but with high computational cost. Instead of considering standard finite automata built over an alphabet of single characters, Tarsis considers automata that are built over an alphabet of strings, comprising a special value to represent statically unknown strings. Tarsis is maintained by the Software and System Verification group @ Ca' Foscari University of Venice, Italy, and it is available on Github (`https://github.com/UniVE-SSV/tarsis`).

Talks

Invited Seminars

Oct. 2025 Invited speaker, "A journey through LiSA and its frontends", Dagstuhl Seminar 25421, Sound Static Program Analysis in Modern Software Engineering

Jul. 2025 Invited seminar, "Improving LLM-generated code by static analysis", Code Metal Inc., Boston, USA

Dec. 2023 Invited seminar, "Taming strings in dynamic languages: An abstract interpretation-based static analysis approach", University of Verona, Italy

Dec. 2021 Invited seminar, "Introduction to LiSA (Library for Static Analysis) and tutorial on of non-relational abstract domains implementation", University of Verona, Italy

International Conferences and Workshops

Jan. 2022 Relational String Abstract Domains, 23th International Conference on Verification, Model Checking, and Abstract Interpretation, VMCAI 2022, Philadelphia, US

Jun. 2021 Static Analysis for Dummies: Experiencing LiSA, 10th ACM SIGPLAN International Workshop on the State of the Art in Program Analysis, online

May 2020 Taming Strings in Dynamic Languages – An Abstract Interpretation-based Static Analysis Approach, PhD Defence, University of Verona, Verona, Italy

Mar. 2020 A Sound Abstract Interpreter for Dynamic Code, 35th ACM/SIGAPP Symposium on Applied Computing, SAC 2020, Brno, Czech Republic (online)

Nov. 2019 Completeness of Abstract Domains for String Analysis of JavaScript Programs, 16th International Colloquium on Theoretical Aspects of Computing, ICTAC 2019, Hammamet, Tunisia

Mar. 2019 Static Program Analysis for String Manipulation Languages, 7th International Workshop on Verification and Program Transformation, VPT 2019, Genova, Italy

Sep. 2016 Abstract Domains for Type Juggling, 6th Numerical and Symbolic Abstract Domains Workshop, NSAD 2016, Edinburgh, Scotland

Others

Feb. 2021 Applicazioni di blockchain e smart contract per i settori produttivi, Pallades (Palestre e laboratori avanzati per la digitalizzazione dell'economia e della società) course - POR FESR Regione Veneto (online)

Teaching

Sep. 2025 - Dec 2025	**Lecturer**, Static analysis and software verification within the Computer Science M.Sc. in University of Parma (academic year 2025-2026). 72 hours of lectures (9 CFU).	*University of Parma*
Sep. 2025 - Dec 2025	**Lecturer**, Fundamentals of Programming (module A) within the Computer Science B.Sc. in University of Parma (academic year 2025-2026). 48 hours of lectures (6 CFU).	*University of Parma*
Sep. 2024 - June 2025	**Lecturer**, Fundamentals of Programming within the Computer Science B.Sc. in University of Parma (academic year 2024-2025). 120 hours of lectures (15 CFU).	*University of Parma*
Dic. 2023	**Lectures**, Fundamentals of Programming in C++ for the Boston College student Lena Marfeo during the Fall semester 2023). 20 hours of lectures and 24 hours of supervision of the student (equivalent to 3 credits in Boston College).	*Boston College/University of Parma*
Sep. 2023 - June 2024	**Lecturer**, Fundamentals of Programming within the Computer Science B.Sc. in University of Parma (academic year 2023-2024). 120 hours of lectures (15 CFU).	*University of Parma*
Dec. 2022	**Lectures**, Analyzing dynamic code: a sound abstract interpreter for eval. Within the "Languages, interpreters, and compilers" Master course, University of Parma, Prof. Enea Zaffanella. 2 hours of lectures.	*University of Parma*

Sep. 2022 - June 2023	**Lecturer,** Fundamentals of Programming within the Computer Science B.Sc. in University of Parma (academic year 2022-2023). 120 hours of lectures (15 CFU).	*University of Parma*
April 2022	**Lecturer,** Introduction to LiSA (Library for Static Analysis) and implementation of non-relation abstract domains. Within the PhD course "A Guided Tour to Static Program Analysis: State-of-the-Art Tools and Techniques", promoted by the Indian Education Ministery, Global Initiative of Academic Networks (GIAN - `https://gian.iitkgp.ac.in/`). Online. 2 hours of lectures.	*Patna, India*
Jan. 2022	**Lectures,** Big data analytics e predictive maintenance. Training course for ACMI S.p.A.. 24 hours of lectures.	*University of Parma*
Sep. 2021 - June 2022	**Lecturer,** Fundamentals of Programming within the Computer Science B.Sc. in University of Parma (academic year 2021-2022). 112 hours of lectures (14 CFU).	*University of Parma*
Mar. 2021	**Lecturer,** Introduction to coding and data management - Practice (module 2) within the Digital Management B.Sc. in University Ca' Foscari of Venice (academic year 2020-2021). 10 hours of lectures.	*Ca' Foscari University of Venice*
Feb. 2021	**Lectures,** Introduction to LiSA (Library for Static Analysis). Within the "Software correctness, security, and reliability" Master course in the Department of Environmental Sciences, Informatics and Statistics, Ca' Foscari University of Venice, Prof. Agostino Cortesi. 2 hours of lectures.	*Ca' Foscari University of Venice*
Dec. 2020	**Lectures,** Introduction to LiSA (Library for Static Analysis) and implementation of non-relation abstract domains. Within the "Autonomous, Distributed and pervasive Systems" PhD course, Ca' Foscari University of Venice, Proff. S. Calzavara, P. Ferrara, A. Marin. 4 hours of lectures	*Ca' Foscari University of Venice*
Gen. 2021	**Lectures,** Introduction to LiSA (Library for Static Analysis) and implementation of non-relation abstract domains. Within the "Foundations of software analysis and verification" Master course, University of Verona, Prof. Isabella Mastroeni. 2 hours of lectures	*University of Verona*
Oct. 2018	**Teaching Assistant,** Teaching assistant for the "Logics" Bachelor course in the Computer Science B.Sc. in Department of Computer Science, University of Verona, Italy	*University of Verona*
Oct. 2017	**Teaching Assistant,** Teaching assistant for the "Programming Languages" and "Logics" Bachelor courses in the Computer Science B.Sc. in Department of Computer Science, University of Verona, Italy	*University of Verona*
Oct. 2016	**Teaching Assistant,** Teaching assistant for the "Foundations of Computing" and "Logics" Bachelor courses in the Computer Science B.Sc. in Department of Computer Science, University of Verona, Italy	*University of Verona*
Gen. 2016	**Lectures,** Introduction to $\mathbb{K}$ Framework and implementation of an imperative, functional and concurrent language. Within the "Foundations of Computing (Module: Languages)" Master course in the Department of Computer Science, University of Verona, Prof. Massimo Merro. 6 hours of lectures.	*University of Verona*
Oct. 2015	**Teaching Assistant,** Teaching assistant for the "Foundations of Computing" Bachelor course in the Computer Science B.Sc. in Department of Computer Science, University of Verona, Italy	*University of Verona*
Oct. 2014	**Teaching Assistant,** Teaching assistant for the "Foundations of Computing" Bachelor course in the Computer Science B.Sc. in Department of Computer Science, University of Verona, Italy	*University of Verona*

Student Supervision

PhD Students

2023-	**Co-advisor,** Greta Dolcetti, PhD student. Expected: March 2027	*Ca' Foscari University of Venice, Italy*

Master Students

Jul. 2023	**Co-supervisor**, Master thesis of Greta Dolcetti (”Abstract Compilation Techniques for Static Analysis”), 110/110 *cum laude*. Supervisor: Prof. Enea Zaffanella	*University of Parma, Italy*
Apr. 2023	**Co-supervisor**, Master thesis of Alessio Diana (”Computational models for task classification via explainable code similarity based on control flow graph features”), 110/110 *cum laude*. Supervisor: Prof. Vincenzo Bonnici	*University of Parma, Italy*
Apr. 2023	**Co-supervisor**, Master thesis of Giacomo Boldini (”Source code clustering via explainable code similarity based on control flow graph features”), 110/110 *cum laude*. Supervisor: Prof. Vincenzo Bonnici	*University of Parma, Italy*
Mar. 2023	**Supervisor**, Master thesis of Simone Gazza (”RustLiSA: a static analysis framework for Rust programs”), 110/110 *cum laude*	*University of Parma, Italy*
Jul. 2020	**Co-supervisor**, Master thesis of Sunyi Xu (”Static analysis of ECMAScript string manipulation operations”), 110/110 *cum laude*. Supervisor: Prof. Isabella Mastroeni	*University of Verona, Italy*
Mar. 2020	**Co-supervisor**, Master thesis of Gabriele Centurino on existing static analyzers of Solidity smart contracts, 103/110, Supervisor: Prof. Isabella Mastroeni	*University of Verona, Italy*
Mar. 2020	**Co-supervisor**, Master thesis of Diego Comencini (”JOE, a complete toolchain for the detection and classification of obfuscated JavaScript malware”), *110/110 cum laude*, Supervisor: Prof. Isabella Mastroeni	*University of Verona, Italy*

Bachelor Students

Nov. 2025	**Supervisor**, Bachelor thesis of Endri Hoxha (”VetNexus — Progettazione e sviluppo di un’app mobile per la comunicazione tra proprietari e veterinari”)	*University of Parma, Italy*
Nov. 2025	**Supervisor**, Bachelor thesis of Paolo Giacosa (”Static analysis of EVM bytecode for detecting vulnerabilities in bridge smart contracts”)	*University of Parma, Italy*
Jul. 2025	**Supervisor**, Bachelor thesis of Shivam Kumar (”Randomness vulnerability detection for Ethereum smart contracts”)	*University of Parma, Italy*
Jul. 2025	**Supervisor**, Bachelor thesis of Parfait Wesilakenda Kubikula-ve (”Study, design, and development of a tool for evaluating the correctness of code generated by LLMs”)	*University of Parma, Italy*
Mar. 2025	**Supervisor**, Bachelor thesis of Denis Guareschi (”Tx.origin vulnerability detection for Ethereum smart contracts”)	*University of Parma, Italy*
Mar. 2025	**Supervisor**, Bachelor thesis of Gabriel Hedi Kenmegne (”Study of e-graphs and their modern applications”)	*University of Parma, Italy*
Dec. 2024	**Supervisor**, Bachelor thesis of Nicolò Manca (”Enhancing LLM code generation with Infer”)	*University of Parma, Italy*
Dec. 2024	**Supervisor**, Bachelor thesis of Germain Noumekpo (”Implementation of the split operator for abstract domains in LiSA”)	*University of Parma, Italy*
Oct. 2024	**Supervisor**, Bachelor thesis of Filippo Bianchi (”Experimental evaluation of the precision of a heuristics for numeric static analyses”)	*University of Parma, Italy*
Sept. 2024	**Supervisor**, Bachelor thesis of Daniele Molinari (”Analysis of Jupyter Notebooks based on abstract data types”), 110/110 *cum laude*	*University of Parma, Italy*
Sept. 2024	**Supervisor**, Bachelor thesis of Francesco Bernini (”Type analysis for Jupyter Notebooks in Lyra”)	*University of Parma, Italy*
Jul. 2024	**Supervisor**, Bachelor thesis of Saverio Mattia Merenda (”Towards a sound construction of EVM bytecode control-flow graphs”)	*University of Parma, Italy*
Jul. 2024	**Supervisor**, Bachelor thesis of Michele Martelli (”Abstract relational domains for strings static analysis”)	*University of Parma, Italy*
Jul. 2024	**Co-Supervisor**, Bachelor thesis of Manuel di Agostino (”Valutazione sperimentale sull’individuazione automatica di errori di programmazione nel codice generato da LLM”)	*University of Parma, Italy*
Mar. 2024	**Supervisor**, Bachelor thesis of Vladimir Ciolpan (”Realizzazione di un robot software per automatizzare il processo di inserimento di dati in un portale web”)	*University of Parma, Italy*
Mar. 2024	**Supervisor**, Bachelor thesis of Lorenzo Ferrari (”Exploiting Overflows: Techniques in Stack, Heap, and Linux Kernel”)	*University of Parma, Italy*
Sep. 2023	**Supervisor**, Bachelor thesis of Davide Tarpini (”Orphan jump resolution in EVM bytecode by abstract interpretation”)	*University of Parma, Italy*

Mar. 2023	**Supervisor**, Bachelor thesis of Matteo Boroni Grazioli (”Implementation in LiSA of the decoupling of ascending and descending phases in abstract interpretation”)	*University of Parma, Italy*
Mar. 2023	**Supervisor**, Bachelor thesis of Lucrezia Porqueddu (”Studio ed Analisi dell’utilizzo di eval e dei costrutti string-to-code in Python”)	*University of Parma, Italy*
Mar. 2023	**Supervisor**, Bachelor thesis of Sergio Salvatore Evola (”Implementation of string abstract domains in LiSA”)	*University of Parma, Italy*
Oct. 2022	**Supervisor**, Bachelor thesis of Simone Leoni (”Finite-state automata abstract domain implementation in LiSA”)	*University of Parma, Italy*
Oct. 2022	**Supervisor**, Bachelor thesis of Alex Sironi (”Control-flow graph generation for EVM bytecode”)	*University of Parma, Italy*
Jun. 2022	**Supervisor**, Bachelor thesis of Lisandro Covanti (”Design and development of API for the integration and usage of a vending machine”)	*University of Parma, Italy*
Mar. 2021	**Co-supervisor**, Bachelor thesis of Nicolò Barbato on the development of a Python frontend for LiSA. Supervisor: Prof. Agostino Cortesi	*Ca’ Foscari University of Venice, taly*
Jul. 2019	**Co-supervisor**, Bachelor thesis of Marco Crosara (“Analyzing string operations for dynamic languages”) Supervisor: Prof. Isabella Mastroeni	*University of Verona, Italy*
Jul. 2019	**Co-supervisor**, Bachelor thesis of Sunyi Xu (“Analyzing string operations for dynamic languages”) Supervisor: Prof. Isabella Mastroeni	*University of Verona, Italy*
Jul. 2019	**Co-supervisor**, Bachelor thesis of Massimiliano Incudini (“Implementazione di un tool di analisi statica tramite interpretazione astratta per Javascript”) Supervisor: Prof. Isabella Mastroeni	*University of Verona, Italy*
Jul. 2016	**Co-supervisor**, Bachelor thesis of Matteo Bonafini (“Implicit Taint analysis nella rilevazione di off-path packet injection”) Supervisor: Prof. Isabella Mastroeni	*University of Verona, Italy*

References

Agostino Cortesi (cortesi@unive.it), Full Professor at the Department of Environmental Sciences, Informatics and Statistics — *Ca’ Foscari University, Italy*

Sergio Maffeis (sergio.maffeis@doc.ic.ac.uk), Associate Professor at the Department of Computing — *Imperial College, London, UK*

Isabella Mastroeni (isabella.mastroeni@univr.it), Associate Professor at the Department of Computer Science — *University of Verona, Italy*

Enea Zaffanella (enea.zaffanella@unipr.it), Associate Professor at the Department of Mathematical, Physical, and Computer Sciences — *University of Parma, Italy*

Autorizzo al trattamento dei dati personali contenuti nel Curriculum Vitae ai sensi del D. Lgs. 196/2003 e all’art. 13 GDPR (Regolamento UE 2016/679) ai fini della ricerca e selezione del personale.