LORENZO FIASCHI

Born: 16/01/1995

lorenzo.fiaschi@gmail.com ◇ LinkedIn ◇ Website ◇ GitHub

ACADEMICS

Postdoctoral researcher, Department of Information Engineering, University of Pisa	2022 - now
Ph.D. of Information Engineering (Honors), University of Pisa	2019 - 2022
Master of Computer Science and A.I. (Honors), University of Genoa [Cumulative GPA: 4.00]	2017 - 2019
Bachelor of Computer Engineering (Honors), University of Pisa [Cumulative GPA: 3.83]	2014 - 2017

TEACHING EXPERIENCE

Assistant Lecturer	Spring 2021 - now
Symbolic and Evolutionary A.I. - Master of Information Engineering - 20 hours - 50 students	*University of Pisa*
Assistant Lecturer	Fall 2019 - now
Elements of Programming - Bachelor of Information Engineering - 20 hours - 250 students	*University of Pisa*

AWARDS

Winner of 1-year mentorship on start-up creation - Funded by University of Modena and Reggio Emilia	2024
Winner of 3,000€ grant for Ph.D. students mobility abroad - Funded by University of Pisa	2022
Winner of 5,000€ grant for international workshop organization[1] - Funded by University of Pisa	2020
Winner of the "Springer Young Researcher Prize"[2] - Funded by Springer Publisher	2019
Winner of the "Francesca Paola Nicotra" scholarship[3] - Funded by Nicotra's family	2009

EUROPEAN PROJECTS PARTICIPATION

FAIR - Future Artificial Intelligence Research	2023 - now
Spoke: 1 - Human-centered AI; Program: PNRR	
WP: 2.3 - Exploiting Non-Standard Analysis to Empower Deep Neural Networks and Reinforcement Learning	
TEXTAROSSA	2022 - 2023
Program: Horizon 2020	
Topic: Mixed precision algorithms for HPC applications of optimization and machine learning	

SERVICE TO THE RESEARCH COMMUNITY

Keynote lecturer	
ICORES24: Lexicographic Multi-Objective Optimization Using Infinite, Finite and Infinitesimal Numbers	2024
Organizer of the following conferences	
Workshop on Hardware accelerators for AI and HPC applications, Pisa, Italy	2020
Program committee member of the following conferences	
IEEE Symposium on CISDA, Xiamen, China	2019
Peer reviewer for the following (selected) journals	
Transactions on Evolutionary Computation	
Journal of Computational and Applied Mathematics	
Remote Sensing	

---

[1] Title: "Hardware accelerators for Deep Neural Networks and Machine Learning".

[2] 500€ grant.

[3] 3,000€ grant, ex-equo.

Journal of Marine Science and Engineering
Computers and Operations Research
Electronics
Applied sciences

Peer reviewer for the following books
Numerical infinities and infinitesimals

Thesis supervisor for the following programs
Master of Artificial Intelligence and Data Engineering, Pisa, Italy   2 theses

INTERNSHIPS AND OTHER ACTIVITIES

Seminar on machine learning for non-linear dynamics inference, University of Genoa   2019
Heart attacks and dementia prediction with machine learning, University of Genoa   2018
Non-Archimedean game theory: a numerical perspective, University of Pisa   2017

TECHNICAL SKILLS

Languages, Scripts, and Technologies: C++, Python, Pytorch, Julia, Matlab
SDK's and Frameworks: CLion, Visual Studio, Jupiter
Text Editors and now ations: LaTeX, Microsoft Word, Microsoft Powerpoint
Repository Management: GitHub
Operating Systems: Windows, Linux Distributions (Debian, Ubuntu, Mint)

LANGUAGE SKILLS

Italian: mothertongue
English: C1

VOLUNTEERING

Co-founder and secretary of a non-profit basketball association   2019 - now
Organizing championships, tournaments, and events in Tuscany and Italy with hundreds of participants each
Duties: Planning of the events, Interface with the sponsor and public administration, Responsible for the IT infrastructure, Manager of the personnel, Coordinator in situ

PUBLICATIONS

[1] **Fiaschi L.** and Cococcioni M. Informed deep hierarchical classification: a non-standard analysis inspired approach. *arXiv*, 2025.

[2] Cococcioni M. and **Fiaschi L.** Linear programming with infinite, finite, and infinitesimal values in the right-hand side. *Applied Mathematics and Computation*, 486:129044, 2025, doi:10.1016/j.amc.2024.129044.

[3] Cococcioni M., Cudazzo A., **Fiaschi L.**, Pappalardo M., and Sergeyev Y. D. A new cutting plane method for lexicographic multi-objective integer linear programming. *Communications in Nonlinear Science and Numerical Simulation*, 129:107674, 2024, doi:10.1016/j.cnsns.2023.107674.

[4] **Fiaschi L.** and Cococcioni M. A non-Archimedean interior point method and its application to the lexicographic multi-objective quadratic programming. *Mathematics*, 10(23):4536, 2022, doi:10.3390/math10234536.

[5] Rossi F., **Fiaschi L.**, Cococcioni M., and Saponara S. Design and fpga synthesis of ban processing unit for non-archimedean number crunching. In Riccardo Berta and Alessandro De Gloria, editors, *Applications in Electronics Pervading Industry, Environment and Society*, pages 320–325, Cham, 2023, doi:10.1007/978-3-031-30333-3_43. Springer Nature Switzerland.

[6] Lai L., **Fiaschi L.**, Cococcioni C., and Kalyanmoy D. Pure and mixed lexicographic-paretian many-objective optimization: state of the art. *Natural Computing*, 1:1–16, 2022, doi:10.1007/s11047-022-09911-4.

[7] Cococcioni M., **Fiaschi L.**, and Lambertini L. On impure prisoners' dilemmas, folk theorems, and correlation devices. In *EARIE 2022 (VIENNA)*, 2022. to appear.

[8] Cococcioni M., **Fiaschi L.**, and Lermusiaux P. Game theory for unmanned vehicles path planning in the marine domain: state of the art and new possibilities. *Journal of Maritime Science and Engineering*, 9:1175, 2021, doi:10.3390/jmse9111175.

[9] Benci V., Cococcioni M., and **Fiaschi L.** Non-standard analysis revisited: an easy axiomatic presentation oriented towards numerical applications. *Applied Mathematics and Computer Science*, 32(1):65–80, 2022, doi:10.34768/amcs-2022-0006.

[10] Cococcioni M., **Fiaschi L.**, and Lambertini L. Computing optimal decision strategies using the infinity computer: the case of non-Archimedean zero-sum games. In *Numerical Infinities and Infinitesimals in Optimization*, pages 271–295. Springer, 2021, doi:10.1007/978-3-030-93642-6_11.

[11] Lai L., **Fiaschi L.**, Cococcioni M., and Deb K. On the use of grossone methodology for handling priorities in multi-objective evolutionary optimization. In *Numerical Infinities and Infinitesimals in Optimization*, pages 183–218. Springer, 2021, doi:10.1007/978-3-030-93642-6_8.

[12] Lai L., **Fiaschi L.**, Cococcioni M., and Deb K. Solving mixed Pareto-lexicographic multi-objective optimization problems: The case of priority levels. *IEEE Transaction on Evolutionary Computation*, 25:971–985, 2021, doi:10.1109/TEVC.2021.3068816.

[13] Cococcioni M., **Fiaschi L.**, and Lambertini L. Non-Archimedean zero-sum games. *Journal of Computational and Applied Mathematics*, 393:113483, 2021, doi:10.1016/j.cam.2021.113483.

[14] Lai L., **Fiaschi L.**, Cococcioni M., and Deb K. Handling priority levels in mixed pareto-lexicographic many-objective optimization problems. *11th Edition of International Conference Series on Evolutionary Multi-Criterion Optimization (EMO2021)*, pages 362–374, 2021, doi:10.1007/978-3-030-72062-9_29.

[15] Cococcioni M. and **Fiaschi L.** The big-M method with the numerical infinite M. *Optimization Letters*, 15(7):2455–2468, 2021, doi:10.1007/s11590-020-01644-6.

[16] Lai L., **Fiaschi L.**, and Cococcioni M. Solving mixed Pareto-lexicographic multi-objective optimization problems: The case of priority chains. *Swarm and Evolutionary Computation*, 55:100687, 2020, doi:10.1016/j.swevo.2020.100687.

[17] **Fiaschi L.** and Cococcioni M. Non-Archimedean Game Theory: A numerical approach. *Applied Mathematics and Computation*, 409:125356, 2020, doi:10.1016/j.amc.2020.125356.

[18] **Fiaschi L.** and Cococcioni M. Generalizing Pure and Impure Iterated Prisoner's Dilemmas to the Case of Infinite and Infinitesimal Quantities. *In Numerical Computations: Theory and Algorithms*, pages 370–377, Cham, 2020. Springer International Publishing, doi:10.1007/978-3-030-40616-5_32.

[19] **Fiaschi L.** and Cococcioni M. Numerical Asymptotic Results in Game Theory Using Sergeyev's Infinity Computing. *International Journal of Unconventional Computing*, 14(1):1–25, 2018.

REFERENCES

Marco Cococcioni, marco.cococcioni@unipi.it, m.cococcioni@gmail.com, Ph.D. Tutor
Vieri Benci, vieri.benci@unipi.it, vieri.benci@gmail.com, Non-Standard Analysis Advisor
Kalyanmoi Deb, kdeb@egr.msu.edu, evolutionary optimization co-author
Luca Lambertini, luca.lambertini@unibo.it, game theory co-author