PERSONAL INFORMATION

Stefano Della Fiore

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RESEARCH INTERESTS

Discrete Mathematics, Information Theory, Combinatorics

WORK EXPERIENCE

October 2024 – ongoing

RTDA Researcher

Educational Institution: University of Brescia

Main activity: Study of new methods to encode and compress multimedia signals using deep learning approaches.

November 2023 – September 2024

Postdoctoral Researcher

Educational Institution: University of Salerno

Main activity: Study of the asymptotic behavior of code rates which is often related to problems in extremal combinatorics.

May 2019 – November 2019

Full stack developer

Main activities and responsibilities: Full stack developer using frameworks such as Eloquent, Slim and Twig. Employed as: intern/trainee - short term agency contact | Company sector: Engineering and design

EDUCATION

a.y. 2019–2022

PhD in Information Engineering   EQF 8

Educational Institution: University of Brescia. Doctor of Philosophy (Ph. D.)

Thesis: *Asymptotic growth of codes and related combinatorial problems*

a.y. 2016–2018

Master's degree in Communication Technologies and Multimedia EQF 7

Educational Institution: University of Brescia, Department of Information Engineering, 2nd level-cycle degree/Master of Science (2 years)

Thesis: *Constraints in Source Coding*

a.y. 2013–2016

Bachelor's degree in Computer Engineering   EQF 6

Educational Institution: University of Brescia - Department of Information Engineering 1st level-cycle degree/Bachelor (3 years)

Thesis: *Implementation of an algorithm for the processing of a sequence based on analysis of iterative local symmetries*

PUBLICATIONS

[1] S. Costa and S. Della Fiore. "Weak Freiman isomorphisms and sequencings of small sets". In: *submitted* (2024).

[2] S. Costa, S. Della Fiore, and A. Ferraguti. "Variants of the Erdős distinct sums problem and variance method". In: *submitted* (2024).

[3] S. Della Fiore and M. Dalai. "Upper bounds on the rate of linear q-ary k-hash codes". In: *IEEE International Symposium on Information Theory* (2024), pp. 2610–2615.

[4] A. Gnutti, S. Della Fiore, M. Savardi, Y. Chen, R. Leonardi, and W. Peng. "LiDAR Depth Map Guided Image Compression Model". In: *IEEE International Conference on Image Processing* (2024), pp. 1890–1896.

[5] S. Costa and S. Della Fiore. "Alternating Parity Weak Sequencing". In: *Journal of Combinatorial Designs* 32 (2024), pp. 308–327.

[6] M. Dalai, S. Della Fiore, A. A. Rescigno, and U. Vaccaro. "An Efficient Algorithm for Group Testing with Runlength Constraints". In: *Discrete Applied MathematicsDiscrete Applied Mathematics* 360 (2024).

[7] S. Costa, S. Della Fiore, and M. A. Ollis. "Sequencings in Semidirect Products via the Polynomial Method". In: *submitted* (2023).

[8] S. Costa and S. Della Fiore. "Existence of λ-Fold Non-zero sum Heffter arrays through local considerations". In: *The Australasian Journal of Combinatorics* 87 (2023), pp. 301–339.

[9] S. Costa and S. Della Fiore. "Bounds on the Higher Degree Erdős-Ginzburg-Ziv Constants over $\mathbb{F}_q^n$". In: *Archiv der Mathematik* 122 (2023), pp. 17–29.

[10] S. Costa, S. Della Fiore, and A. Ferraguti. "Higher degree Erdős distinct evaluations problem". In: *European Conference on Combinatorics, Graph Theory and Applications* 12 (2023).

[11] M. Dalai, S. Della Fiore, A. A. Rescigno, and U. Vaccaro. "Bounds and Algorithms for Frameproof Codes and Related Combinatorial Structures". In: *IEEE Information Theory Workshop* (2023), pp. 544–549.

[12] S. Costa, M. Dalai, and S. Della Fiore. "Variations on the Erdős distinct-sums problem". In: *Discrete Applied Mathematics* 325 (2023), pp. 172–185.

[13] S. Della Fiore, M. Dalai, and U. Vaccaro. "Achievable Rates and Algorithms for Group Testing with Runlength Constraints". In: *IEEE Information Theory Workshop* (2022), pp. 576–581.

[14] S. Della Fiore, A. Gnutti, and S. Polak. "The maximum cardinality of trifferent codes with lengths 5 and 6". In: *Examples and Counterexamples* 2 (2022), p. 100051.

[15] S. Costa and S. Della Fiore. "Weak sequenceability in cyclic groups". In: *Journal of Combinatorial Designs* 30.12 (2022), pp. 735–751.

[16] S. Costa, S. Della Fiore, M. A. Ollis, and S. Z. Rovner-Frydman. "On Sequences in Cyclic Groups with Distinct Partial Sums". In: *The Electronic Journal of Combinatorics* 29 (3 2022), P3.33–P3.33.

[17] S. Costa, S. Della Fiore, and Anita Pasotti. "Non-zero sum Heffter arrays and their applications". In: *Discrete Mathematics* 345 (9 2022), p. 112952.

[18] S. Della Fiore and M. Dalai. "A note on $\overline{2}$-separable codes and B_2 codes". In: *Discrete Mathematics* 345 (3 2022), p. 112751.

[19] S. Della Fiore, S. Costa, and M. Dalai. "New upper bounds for (b,k)-hashing". In: *IEEE International Symposium on Information Theory* (2021), pp. 256–261.

[20] S. Della Fiore, S. Costa, and M. Dalai. "Improved Bounds for (b,k)-Hashing". In: *IEEE Transactions on Information Theory* 68 (8 2022), pp. 4983–4997.

REVIEWING ACTIVITIES

Activities — Reviewer for several journals in different areas, among which: "Journal of Combinatorial Theory (JCTA)", "Designs, Codes and Cryptography", "IEEE Transactions on Information Theory", "IEEE Transactions on Image Processing"

TEACHING ACTIVITIES

a.y. 2024–2025 — Assistant for "Advanced Methods for Information Representation" (6CFU), Master of Science in Telecommunication Engineering, University of Brescia

a.y. 2024–2025 — Assistant for "Algebra Lineare e Geometria" (6CFU), Bachelor of Science in Physical and Mathematical Engineering, University of Brescia

a.y. 2023–2024 — Assistant for "Elementi di Telecomunicazione" (6CFU), Bachelor of Science in Telecommunication Engineering, University of Brescia

a.y. 2023–2024 — Tutor for "Algebra e Geometria" (9CFU), Bachelor of Science in Computer Engineering, University of Brescia

CONFERENCES

ISIT 2021 — IEEE International Symposium on Information Theory, Melbourne, Australia, July 2021

ITW 2021	IEEE Information Theory Workshop, Kanazawa, Japan, October 2021
Combinatorics 2022	International conference in pure and applied combinatorics, Mantua, Italy, May 2022
ISIT 2022	IEEE International Symposium on Information Theory, Espoo, Finland, June 2022
ITW 2022	IEEE Information Theory Workshop, Mumbai, India, November 2022
4TU workshop	4TU Combinatorics in digital communications workshop, Eindhoven, Holland, April 2023
ITW 2023	IEEE Information Theory Workshop, Saint–Malo, France, April 2023
ISIT 2024	IEEE International Symposium on Information Theory, Athens, Greece, July 2024

ACADEMIC SCHOOLS

ESIT 2018	European School of Information Theory, Bertinoro, Italy, May 2018
ESIT 2021	European School of Information Theory, Online, November 2020
NASIT 2021	North America School of Information Theory, Online, June 2021
ESIT 2022	European School of Information Theory, Wien, Austria, July 2021

PERSONAL SKILLS

Mother tongue   Italian

Other languages

UNDERSTANDING		SPEAKING		WRITING
Listening	Reading	Spoken interaction	Spoken production	
English B2	B2	B2	B2	B2

Computer skills   experience with Python, C, C++, Java, Matlab, Mathematica, GAP and SageMath