

PERSONAL INFORMATION

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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, S. Della Fiore, and E. Engel. "Graham's rearrangement for dihedral groups". In: *submitted* (2025).
- [2] S. Della Fiore, A. Gnutti, M. Dalai, P. Migliorati, and R. Leonardi. "TFIC: End-to-End Text-Focused Image Compression for Coding for Machines". In: *submitted* (2025).
- [3] S. Costa and S. Della Fiore. "Weak Freiman isomorphisms and sequencings of small sets". In: *submitted* (2025).
- [4] S. Costa, S. Della Fiore, and M. A. Ollis. "Sequencings in Semidirect Products via the Polynomial Method". In: *to appear in the 34th Midwestern Conference on Combinatorics and Combinatorial Computing* (2025).

- [5] S. Costa, S. Della Fiore, and A. Ferraguti. "Variants of the Erdős distinct sums problem and variance method". In: *Discrete Applied Mathematics* 369 (2025), pp. 110–123.
- [6] 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.
- [7] 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.
- [8] S. Costa and S. Della Fiore. "Alternating Parity Weak Sequencing". In: *Journal of Combinatorial Designs* 32 (2024), pp. 308–327.
- [9] M. Dalai, S. Della Fiore, A. A. Rescigno, and U. Vaccaro. "An Efficient Algorithm for Group Testing with Runlength Constraints". In: *Discrete Applied Mathematics* 360 (2024).
- [10] 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.
- [11] 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.
- [12] 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).
- [13] M. Dalai, S. Della Fiore, A. A. Rescigno, and U. Vaccaro. "Bounds and Algorithms for Frame-proof Codes and Related Combinatorial Structures". In: *IEEE Information Theory Workshop* (2023), pp. 544–549.
- [14] S. Costa, M. Dalai, and S. Della Fiore. "Variations on the Erdős distinct-sums problem". In: *Discrete Applied Mathematics* 325 (2023), pp. 172–185.
- [15] 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.
- [16] S. Della Fiore, A. Gnutti, and S. Polak. "The maximum cardinality of triferent codes with lengths 5 and 6". In: *Examples and Counterexamples* 2 (2022), p. 100051.
- [17] S. Costa and S. Della Fiore. "Weak sequenceability in cyclic groups". In: *Journal of Combinatorial Designs* 30.12 (2022), pp. 735–751.
- [18] 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.
- [19] S. Costa, S. Della Fiore, and Anita Pasotti. "Non-zero sum Heffter arrays and their applications". In: *Discrete Mathematics* 345 (9 2022), p. 112952.
- [20] S. Della Fiore and M. Dalai. "A note on $\bar{2}$ -separable codes and B_2 codes". In: *Discrete Mathematics* 345 (3 2022), p. 112751.
- [21] 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.
- [22] 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"
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TEACHING ACTIVITIES

a.y. 2024–2025	Assistant for "Fondamenti di Automatica" (9CFU), Bachelor of Science in Information Engineering, University of Brescia
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