ROBERTO BRUNO

Curriculum Vitae - 16th February 2026

PERSONAL INFORMATION

Name: Roberto Bruno
Date of Birth: 25th March 1998
Address: Via Contrada Valloni, 5, 83043 Bagnoli Irpino (AV), Italy
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EDUCATION

University of Salerno Fisciano, SA
PhD student in Computer Science 2022 - currently
Supervisor: *Prof. Ugo Vaccaro*
Research Area: Information Theory and its application
Thesis: From Search to Coding (and Back): Two Sides of the Same Coin

University of Salerno Fisciano, SA
Master's degree in Computer Science 2020 - 2022
Thesis: Application of Information Theory functionals to dimension reduction of probability distributions
***Grade* 110/110 cum laude**
Academic advisor: *Prof. Ugo Vaccaro*

University of Salerno Fisciano, SA
Bachelor's degree in Computer Science 2017 - 2020
Thesis: Exact Exponential Algorithms
***Grade* 110/110 cum laude**
Academic advisor: *Prof. Ugo Vaccaro*

RESEARCH ACTIVITY AND WORK EXPERIENCE

PhD student at University of Salerno November 2022 - currently
Main research topics: Information Theory, Data Structures and Algorithms.
Academic advisor: Prof. Ugo Vaccaro

Visiting Research Student at Okinawa Institute of Science and Technology (OIST) May 2025 - Nov. 2025
Main research topics: Information measures application to Hypothesis Testing
Supervisor: Prof. Amedeo Roberto Esposito

PUBLICATIONS

Title: *Bounds and Algorithms for Alphabetic Codes and Binary Search Trees*
Authors: Roberto Bruno, Roberto De Prisco, Alfredo De Santis, Ugo Vaccaro;
Journal: IEEE Transactions on Information Theory;
DOI: 10.1109/TIT.2024.3428699

Title: *NP-Hardness and Approximation Algorithms for Constrained Entropy Maximization*
Authors: Roberto Bruno, Ugo Vaccaro;
Journal: IEEE Transactions on Information Theory;
DOI: 10.1109/TIT.2025.3644150

Title: *A Note on Equivalent Conditions for Majorization*
Authors: Roberto Bruno, Ugo Vaccaro;
Journal: AIMS Mathematics;
DOI: 10.3934/math.2024419

Title: *Hardness and Approximability of Dimension Reduction on the Probability Simplex*
Authors: Roberto Bruno;
Journal: Algorithms MDPI;
DOI: 10.3390/a17070296
Recognition: Editor's Choice Award

Title: *Entropic Bounds on the Average Length of Codes with a Space*
Authors: Roberto Bruno, Ugo Vaccaro;
Journal: Entropy MDPI;
DOI: 10.3390/e26040283

Title: *Old and New Results on Alphabetic Codes*
Authors: Roberto Bruno, Roberto De Prisco, Ugo Vaccaro;
Journal: Proceedings of the Workshop on Information Theory and Related Fields, Lecture Notes in Computer Science; DOI: 10.1007/978-3-031-82014-4_7

Title: *Optimal Binary Variable-Length Codes with a Bounded Number of 1's per Codeword: Design, Analysis, and Applications*
Authors: Roberto Bruno, Roberto De Prisco, Ugo Vaccaro;
Conference: IEEE International Symposium on Information Theory, ISIT 2025, Ann Arbor, Michigan, USA.

Title: *A Note on Yager's Negation*
Authors: Roberto Bruno, Ugo Vaccaro;
Current Status: to be submitted.

Title: *Shift-Invariant Superimposed Codes and their Applications*
Authors: Roberto Bruno, Adele Rescigno, Ugo Vaccaro;
Current Status: to be submitted.

PERSONAL SKILLS

Organisational / Managerial Skills

Management and Scheduling Thanks to the PhD work activities and the exams carried out, I could improve my ability to organize work to meet deadlines. Both in preparation for exams and in work, I have shown good ability organization, always accomplishing the assigned tasks as well as possible. Especially during PhD research activity.

Communication Skills

Communication During my studies and research activity, I've had the opportunity to develop good communication and interpersonal skills. Participating in international summer schools also allowed me to work on my interpersonal skills enhancing my ability to interact with others and to work as part of a team.

Job related Skills

C/C++	●●●◐○	Java	●●●○○
JavaScript	●●●○○	MATLAB	●●○○○
SQL	●●○○○	Python	●●◐○○

Programming Models: SYCL, CUDA, OpenMP, MPI.
Technologies: Relational Databases, NoSQL Databases (MongoDB), Docker, Git.
Interests: Information Theory, Algorithms and Data structures, Game Theory, Artificial Intelligence.
Master's degree courses:

Information Theory: Basic concepts of Information Theory; Data compression; Data security.
Optimization methods: Linear and integer programming techniques.
Advanced algorithms: Exact algorithms; Approximated algorithms; Randomised algorithms; Online and distributed algorithms.
Distributed architectures: P2P protocols; Distributed networks; Leader election and consensus problem on distributed systems.

OTHER INFORMATION

Languages

Italian
Mother tongue

English
Listening — B2
Reading — C1
Spoken interaction — B2
Spoken production — B2
Writing — C1

Università degli Studi di Salerno
Centro Linguistico di Ateneo
June 2021

ACADEMIC PROJECTS

SYCL Performance Portability

Project realized for High-Performance Computing Master course, based on a performance portability study on AMD CPU and NVIDIA GPU of different types of matrix multiplication implementations using SYCL.

Auction Mechanism

Project realized for a Master course. It is based on the design and development in Java of an auction mechanism based on a P2P Network using TomP2P library.

Toy compiler

My colleagues and I developed a source-to-source toy compiler addressing the stages of compiler development from lexical analysis to intermediate code generation.

MyTutor

MyTutor was developed for the Software Engineering course to digitalize and speed up the procedure for requesting the Help Teaching activities at the Computer Science Department of the University of Salerno.

PRIVACY TREATMENT & SIGNATURE

I give consent to process my data with the purpose of the recruitment process, in accordance to the Regulation of the European Parliament 679/2016, regarding the protection of natural persons and free movement of such data.

Fisciano, 16/02/2026
Signature