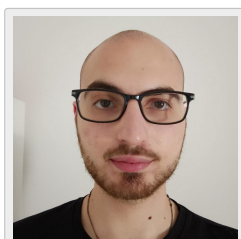


# ROBERTO BRUNO

Curriculum Vitae - 16<sup>th</sup> February 2026

## PERSONAL INFORMATION



**Name:** Roberto Bruno

**Date of Birth:** 25<sup>th</sup> March 1998

**Address:** Via Contrada Valloni, 5,  
83043 Bagnoli Irpino (AV), Italy

**Phone:** +39 345 85 67 214

**E-Mail:** roberto250398@gmail.com

**Institutional E-Mail:**

rbruno@unisa.it

**GitHub Profile:** @Rob11001

**LinkedIn Profile:**

robertobruno11001

**ORCID:** 0000-0001-6039-2075

## EDUCATION

### University of Salerno

*PhD student in Computer Science*

Supervisor: *Prof. Ugo Vaccaro*

Research Area: Information Theory and its application

Thesis: From Search to Coding (and Back): Two Sides of the Same Coin

Fisciano, SA

2022 - currently

### University of Salerno

*Master's degree in Computer Science*

Thesis: Application of Information Theory functionals to dimension reduction of probability distributions

**Grade 110/110 cum laude**

Academic advisor: *Prof. Ugo Vaccaro*

Fisciano, SA

2020 - 2022

### University of Salerno

*Bachelor's degree in Computer Science*

Thesis: Exact Exponential Algorithms

**Grade 110/110 cum laude**

Academic advisor: *Prof. Ugo Vaccaro*

Fisciano, SA

2017 - 2020

## RESEARCH ACTIVITY AND WORK EXPERIENCE

### PhD student at University of Salerno

*Main research topics:* Information Theory, Data Structures and Algorithms.

*Academic advisor:* Prof. Ugo Vaccaro

November 2022 - currently

### 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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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

<b>English</b>	Università degli Studi di Salerno
Listening — B2	Centro Linguistico di Ateneo
Reading — C1	June 2021
Spoken interaction — B2	
Spoken production — B2	
Writing — C1	

## 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.

<b>PRIVACY TREATMENT &amp; SIGNATURE</b>
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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