

Alberto Bucci

Curriculum Vitae

Department of Mathematics, University of Pisa
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🌐 <https://github.com/alb95>



Current position

- 2021-now **PhD student in Mathematics,**
Department of Mathematics, University of Pisa, Italy.
- **Supervisor:** Prof. Leonardo Robol.
 - **Research area:** randomized techniques for the low-rank decomposition of tensors.
 - **PhD defense date:** expected at the end of 2024.

Previous positions

- 2020-2021 **Collaboration contract,**
Department of Mathematics, Scuola Normale Superiore, Italy.
- **Coordinators:** Prof. Michele Benzi & Prof. Fabrizio Lillo.
 - **Project description:** Development of a Python library for describing, model, and study complex and dynamic networks: NetworkSNS.

Education

- 2017-2019 **Master degree in Mathematics,**
Department of Mathematics, University of Pisa, Italy.
- **Thesis:** Newton-type methods for the Multilinear PageRank.
 - **Advisor:** Prof. Federico Poloni.
 - **Date:** December 13, 2019.
 - **Final mark:** 110/110.
- 2014-2017 **Bachelor degree in Mathematics,**
Department of Mathematics, University of Pisa, Italy.
- **Thesis:** Post-quantum cryptography: NTRU.
 - **Advisor:** Prof. Carlo Traverso.
 - **Date:** September 23, 2017.
 - **Final mark:** 110/110 cum Laude.

Teaching

- 2023-2024 Tutor in Scientific Calculus (University of Pisa).

- 2022-2023 Tutor in Scientific Calculus (University of Pisa).
2021-2022 Tutor in Laboratory of Computational Mathematics (University of Pisa).
2021 Supply Maths Teacher (Penne, Italy).
2015-2016 Math Olympiad Lecturer for the Italian Mathematical Union (Bologna, Italy).

Publications

- 2021 **A continuation method for computing the multilinear Pagerank.**
Numerical Linear Algebra with Applications. — doi.org/10.1002/nla.2432
A. B., F. Poloni
- 2023 **A multilinear Nyström algorithm for low-rank approximation of tensors in Tucker format (Accepted in SIMAX).**
A. B., L. Robol — arXiv:2309.02877
- 2024 **A sequential multilinear Nyström algorithm for streaming low-rank approximation of tensors in Tucker format.**
Applied Mathematics Letters. — doi.org/10.1016/j.aml.2024.109271
A. B., B. Hashemi
- 2024 **Randomized sketched TT-GMRES for linear systems with tensor structure.**
A.B., D. Palitta, L. Robol — arXiv:2409.09471

Research visits

- 2024 **University of Oxford ,**
Oxford, England (40 days).
- Visit to Prof. Yuji Nakatsukasa to start an ongoing collaboration on the stability of Nyström approximation.

International collaborators

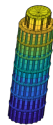
- Behnam Hashemi, University of Leicester, England.
- Yuji Nakatsukasa, University of Oxford, England.
- Taejun Park, University of Oxford, England.
- Gianfranco Verzella, University of Geneva, Switzerland.

Other scientific activities

Referee for the following journals

- Applied Numerical Mathematics
- Numerical Linear Algebra with Applications
- Applied Mathematics and Computation
- Applied Numerical Mathematics
- Linear and Multilinear Algebra
- Numerical Algorithms
- Operators and Matrices

Organizer of the following seminars



Founder and organizer of Pysanum (Pisan Young Seminars in Applied and NUmberical Mathematics): a seminar series on numerical analysis and applied mathematics tailored for students and young researchers.

Schools

- Participation to the summer school: "Gene Golub SIAM Summer School on Iterative and Randomized Methods for Large-Scale Inverse Problems" (Quito, Ecuador, 2024).
- Participation to the summer school: "High-Dimensional Approximation: From Theoretical Foundations to Machine Learning and PDEs" (Cetraro, Italy, 2024)
- Participation to the summer school: "Machine Learning: From Data to Mathematical Understanding" (Cetraro, Italy, 2023).
- Participation to the Mini Course on Computational Methods for Large-Scale Matrix Equations and Application to PDEs. Professor: Valeria Simoncini (L'Aquila, Italy, 2021).
- Participation to the winter school: "Fourth EACA International School on Computer Algebra and its Applications" (Santiago De Compostela, Spain, 2018).

Invited talks

- SIAM Conference on Applied Linear Algebra (Paris, France, May 13 - 17, 2024).
- Sketching, Mixed Precision, and Associated Algorithms for Scientific Computing (Bologna, Italy, 18 -19 January, 2024).
- 25th Conference of ILAS (Madrid, Spain, 12-16 June, 2023).

Contributed talks

- METT X - 10th Workshop on Matrix Equations and Tensor Techniques (Aachen, Germany, 13–15 September, 2023).
- Numerical Linear Algebra Days (L'Aquila, Italy, 10–12 May, 2023).
- GAMM ANLA Workshop (Prague, Czech Republic, 22-23 September, 2022).

Other conferences

- Exploiting Algebraic and Geometric Structure in Time-Integration Methods (Pisa, Italy, 3-5 May, 2024).
- Due Giorni di Algebra Lineare Numerica e Applicazioni (Napoli, Italy, 14-15 Feb, 2022).
- Due Giorni di Algebra Lineare Numerica (Rome, Italy, 18-19 Feb, 2019).

Projects and grants

- 2024 Research project GNCS: Metodi di riduzione di modello ed approssimazioni di rango basso per problemi alto-dimensionali.
- 2023 Research project GNCS: Metodi basati su matrici e tensori strutturati per problemi di algebra lineare di grandi dimensioni.
- 2022 PRIN 2022 Project: Low-rank Structures and Numerical Methods in Matrix and Tensor Computations and their Application.

Awards

- 2017-2019 INDAM Mathematical research fellowship – Istituto Nazionale di Alta Matematica "Francesco Severi".
- 2014-2017 INDAM Scholarship for the enrollment at maths – Istituto Nazionale di Alta Matematica "Francesco Severi".
- 2014 Finalist at the Italian Physics Olympiad.
- 2014 Finalist at the Italian Mathematics Olympiad.

Foreign languages

- Italian Mother tongue
- English Fluent speaking and writing skills (Certificate: B2 First – Cambridge Assessment English)

Research interests

The main focuses of my research are randomized techniques and tensors, with a particular focus on low-rank decomposition and resolution of large-scale linear systems. I have also worked on sparse matrix computations, iterative methods, and matrix functions with applications to complex networks and Markov chains. Currently, I am also interested in applications in quantum computing.