Francesca Marzi

Curriculum Vitae

Personal Information

Name	Francesca
Surname	Marzi

Experiences

July 2023 - Present — **Software developer**
Applications, networks and database area
University of L'Aquila, L'Aquila, (Italy)

March 2023 - June 2023 — **Assistant Professor (RTDa)**
DISIM - University of L'Aquila, L'Aquila, (Italy)

September 2022 - February 2023 — **Postdoctoral researcher**
DISIM - University of L'Aquila, L'Aquila, (Italy)

Research: Development of innovative data analysis techniques that take into account the diverse nature of the collected data; the definition of novel approaches to visualize raw and analyzed data.

September 2020 - August 2022 — **Postdoctoral researcher**
MESVA - University of L'Aquila, L'Aquila, (Italy)

Research: Data analysis in epidemiological studies related to Covid-19 infection in Italy, Europe and in the context of prisons of central Italy.

June 2019 - February 2020 — **Postdoctoral researcher**
DISIM - University of L'Aquila, L'Aquila, (Italy)

Research: Theoretical analysis of compact and extended formulations for packing problems. Implementation of the above formulations in the main branch-and-cut frameworks, both commercial (`CPLEX`, `GUROBI`) and open source (`SCIP`). Computational analysis on existing test-beds in literature and on new test-beds derived from the activities of the PRIN project "Scheduling cuts: new optimization models and algorithms for cutting, packing and nesting in manufacturing processes"

May 2017 - April 2019 — **Postdoctoral researcher**
DISIM - University of L'Aquila, L'Aquila, (Italy)

Research: Use of formalisms and results of the transducer theories and trace languages (by Mazurkiewicz) in the study and creation of protocol mediators. Analysis of the effect of using optimal parsing within the classic dictionary algorithms `LZ77` and `LZ78`

June - July 2016 — **Teaching assistant for Erasmus students**
DISIM - University of L'Aquila, L'Aquila, (Italy)

Teaching exercises for Erasmus students for the Network Design course

Education

<table>
<tr><td>October 2020</td><td>Introduction to the medical statistics: the basis for collecting, analyzing and reporting clinical data
Fondazione GIMBE</td></tr>
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October 2020 | **Introduction to the medical statistics: the basis for collecting, analyzing and reporting clinical data**
Fondazione GIMBE

January 2014 - May 2018 | **Phd in Computer Science**
DISIM - University of L'Aquila, L'Aquila, (Italy)

Advisor: Prof. Filippo Mignosi, University of L'Aquila

Title of Thesis: Combinatorics, Formal Languages And Optimization Problems.

Grade: Cum laude

May 2016 | **Spring School: Extended Formulations for Combinatorial Optimization**
University of Salerno, Vietri Sul Mare, (Italy)

Study of construction techniques and lower bound of extended formulations.

July 2013 | **Master Degree in Computer Science**
DISIM - University of L'Aquila, L'Aquila, (Italy)

Title of Thesis: On distance between words

Grade: 110/110 cum laude

February 2013 | **"IBM Netezza Appliance" course**
DISIM - University of L'Aquila, L'Aquila, (Italy)

February - July 2012 | **"Advanced English for Computer Science" course**
DISIM - University of L'Aquila, L'Aquila, (Italy)

July 2010 | **Bachelor Degree in Computer Science**
DISIM - University of L'Aquila, L'Aquila, (Italy)

Title of Thesis: On distance between matrices

Grade: 110/110 cum laude

July 2005 | **Secondary School Diploma in Computer Science**
Technical Institute "Amedeo D'Aosta", L'Aquila, (Italy)

Publications

[**1**] Aronica, S., Langiu, A., Marzi, F., Mazzola, S., Mignosi, F., and Nazzicone, G. *Compressing big data: When the rate of convergence to the entropy matters.* In Mathematical Aspects of Computer and Information Sciences (Cham, 2016), I. S. Kotsireas, S. M. Rump, and C. K. Yap, Eds., Springer International Publishing, pp. 285–289. `https://doi.org/10.1007/978-3-319-32859-1_24`

[**2**] Letchford, A. N., Marzi, F., Rossi, F., and Smriglio, S. *Strengthening chvátal-gomory cuts for the stable set problem.* In Combinatorial Optimization (Cham, 2016), R. Cerulli, S. Fujishige, and A. R. Mahjoub, Eds., Springer International Publishing, pp. 201–212. `https://doi.org/10.1007/978-3-319-45587-7_18`

[3] Aronica, S., Langiu, A., Marzi, F., Mazzola, S., and Mignosi, F. *On optimal parsing for lz78-like compressors.* Theoretical Computer Science vol. 710 (2018), pp 19–28. Advances in Algorithms and Combinatorics on Strings (Honoring 60th birthday for Prof. Costas S. Iliopoulos). `https://doi.org/10.1016/j.tcs.2017.02.019`

[4] Altobelli, E., Amichetti, M., Langiu, A., Marzi, F., Mignosi, F., Pisciotta, P., Placidi, G., Rossi, F., Russo, G., Schwarz, M., Smriglio, S., Vennarini, S., *Combinatorial optimisation in radiotherapy treatment planning*, AIMS Medical Science, 2018, 5(3): 204-223. `http://dx.doi.org/10.3934/medsci.2018.3.204`

[5] Marzi, F., Rossi, F. and Smriglio, S. *Computational study of separation algorithms for clique inequalities*, Soft Computing (2019), Soft Comput. 23(9): 3013-3027 (2019). `https://doi.org/10.1007/s00500-019-03769-y`

[6] Aragona, R., Marzi, F., Mignosi, F., Spezialetti, M., *Entropy and Compression: A Simple Proof of an Inequality of Khinchin-Ornstein-Shields,* Problems of Information Transmission, Volume 56, 13–22 (2020). `https://doi.org/10.1134/S0032946020010020`

[7] Altobelli, E., Marzi, F., Angelone, A., Mazzocca, R., Mastrodomenico, M., Petrocelli, R., Marziliano, C., *Burden of COVID-19 and Vaccination Coverage in the Italian Population as of October 2021,* International Journal of Environmental Research and Public Health, 2022, 19(1):496. `https://doi.org/10.3390/ijerph19010496`

[8] Altobelli, E.; Angeletti, P.M.; Marzi, F.; D'Ascenzo, F.; Petrocelli, R.; Patti, G. *Impact of SARS-CoV-2 Outbreak on Emergency Department Presentation and Prognosis of Patients with Acute Myocardial Infarction: A Systematic Review and Updated Meta-Analysis,* J. Clin. Med. 2022. 11, 2323. `https://doi.org/10.3390/jcm11092323`

[9] Altobelli, E.; Galassi, F.; Mastrodomenico, M.; Frabotta, F.; Marzi, F.; Angelone, A.M.; Marziliano, C. *Severity of Sars-Cov2 infection in inmates with comorbidity: a cross-sectional study of central Italy,* International Journal of Environmental Research and Public Health 20.4 (2023): 3079. `https://doi.org/10.3390/ijerph20043079`

[10] Bianchi, A., d'Aloisio, G., Marzi, F., & Di Marco, A. (2023). A Decision Tree to Shepherd Scientists through Data Retrievability. `https://arxiv.org/abs/2304.05767`

[11] Altobelli, E., Marzi, F., Angeletti, P. M., Galassi, F., Guercache, A. K., Profeta, V. F., & Angelone, A. M. (2023, May). The Burden of Modifiable Cardiovascular Risk Factors in a Population of Central Italy: A Pilot Study. In Healthcare (Vol. 11, No. 10, p. 1473). MDPI. `https://doi.org/10.3390/healthcare11101473`

[12] Epifanio, C., Forlizzi, L., Marzi, F., Mignosi, F., Placidi, G., & Spezialetti, M. (2023). On the k-Hamming and k-Edit Distances. arXiv preprint arXiv:2306.09144. `https://doi.org/10.48550/arXiv.2306.09144`

[13] Bianchi, A., Di Marco, A., Marzi, F., Stilo, G., Pellegrini, C., Masi, S., Mengozzi, A., Nobile, M.S., & Simeoni, M. (2023, June). Trustworthy Machine Learning Predictions to Support Clinical Research and Decisions. In 2023 IEEE 36th International Symposium on Computer-Based Medical Systems (CBMS) (pp. 231-234). IEEE. `https://doi.org/10.1109/CBMS58004.2023.00222`

[**14**] d'Aloisio, G., d'Angelo, A., Marzi, F., Di Marco, D., Stilo, G., & Di Marco, A. (2023).Data-Driven Analysis of Gender Fairness in the Software Engineering Academic Landscape. `https://doi.org/10.48550/arXiv.2309.11239`

[**15**] Marzi, F., d'Aloisio, G., Di Marco, A., Stilo, G. (2023). Towards a Prediction of Machine Learning Training Time to Support Continuous Learning Systems Development. `https://doi.org/10.48550/arXiv.2309.11226`

PhD Thesis

[**14**] Marzi, F., *Combinatorics, Formal Languages And Optimization Problems.* 2018, Phd Thesis

Other Publication

[**15**] Aragona, R., Marzi, F., Mignosi, F., and Spezialetti, M. *Entropy and Compression: A simple proof of an inequality of Khinchin-Ornstein-Shields.* arXiv:1907.04713, `https://arxiv.org/abs/1907.04713`

[**16**] Marzi, F., Mignosi, F., Rossi, F., Smriglio, S., *Intensity Modulated Proton Therapy by Integer Programming*, Abstract in session MD-14: Computational Methods in Integer Programming, 30th European Conference on Operational Research, 2019

[**17**] Mazzocca, R., Mastrodomenico, M., Marzi, F., Marziliano, C., Angelone, A., Altobelli, E., *Vaccinazione in carcere una priorità per detenuti e personale: una indagine su Sars-Cov2 nelle carceri italiane.* Atti 54° Congresso Nazionale della Società Italiana di Igiene, Medicina Preventiva e Sanità Pubblica (SItI) Lecce 3-6 Novembre 2021

[**18**] Mastrodomenico, M., Angelone, A., Marzi, F., Frabotta, F., Marziliano, C., Altobelli, E., *Covid-19: uno studio sulla Casa di Reclusione di Sulmona..* Atti XXX Congresso Interregionale SICULO-CALABRO della Società Italiana di Igiene, Medicina Preventiva e Sanità Pubblica (SItI) Lipari, 26-28 maggio 2022

[**19**] Altobelli, E., Angelone, A., Marziliano, C., Marzi, F., Angeletti, P., Giuliani, A., Mastrodomenico, M., *Epidemiologia di una Pandemia del XXI Secolo.* Monografia

[**20**] Mastrodomenico, M., Angelone, A., Marzi, F., Galassi, F., Frabotta, F., Marziliano, C., Altobelli, E., *SARS-CoV-2: uno studio sulla Casa di Reclusione di Sulmona e sulla Casa Circondariale di L'Aquila.* Atti 55° Congresso Nazionale della Società Italiana di Igiene, Medicina Preventiva e Sanità Pubblica (SItI), Padova 28 Settembre - 1 Ottobre 2022

[**21**] Altobelli, E., Angeletti, P., Marzi, F., D'Ascenzo, F., Petrocelli, R., Patti, G., *Hospital admissions and mortality for STEMI and NSTEMI during COVID-19 outbreak: a meta-analysis: Paolo Matteo Angeletti.* .European Journal of Public Health, 32 (Suppl 3) 2022

[**22**] Galassi, F., Angelone, A. M., Marziliano, C., Marzi, F., Mastrodomenico, M., Frabotta, F. (2023). Covid-19 infection and comorbidities: A cross-sectional study on two central italy prisons. Population Medicine, 5(Supplement), A850. `https://doi.org/10.18332/popmed/164527`

Partecipation to Research Projects

- Member of the Automata, Formal Languages and Stringology research group (2014 - 2020)
- Participation to PRIN project 2015 $n°$ `20153TXRX9`, *Scheduling cuts: new optimization models and algorithms for cutting, packing and nesting in manufacturing processes*
- Member of the *Società Italiana Di Igiene, Medicina Preventiva e Sanità Pubblica (SItI)*, year 2022
- Member of Data Science and Engineering research group (2022 - 2023)
- Member of the IEEE Association, year 2023
- Participation to *Territori Aperti* project
- Participation to *FAIR-EDU: Promote FAIRness in EDUcation Institutions* project
- Participation to *SoBigData.it* project
- Participation to *National Centre for HPC, Big Data and Quantum Computing* project

Founded Projects

- Data-quality-driven estimation of computational complexity of Machine Learning systems. Research Starting Project, 2023, University of L'Aquila. 2250€

Committee and Reviewing Activity

- Subreviewer for 25th International Conference on Fundamental Approaches to Software Engineering
- Publicity Chair IEEE 36th International Symposium on Computer Based Medical Systems (CBMS) 2023
- Program Committee IEEE 36th International Symposium on Computer Based Medical Systems (CBMS) 2023
- Reviewer for IEEE 36th International Symposium on Computer Based Medical Systems (CBMS) 2023

Conferences

- Student Volunteer at Software Technologies: Applications and Foundations (STAF) July 2015, L'Aquila, Italy
- Mathematical Aspects of Computer and Information Sciences (MACIS), 11-13 November 2015, Berlin, Germany
- International Symposium on Combinatorial Optimization (ISCO), 16-18 May 2016, Vietri Sul Mare (SA), Italy
- European Conference on Operational Research (EURO), 23-26 June 2019, Dublin, Ireland
- XXX Congress Interregionale SICULO-CALABRO Siti "1990-2022 Trentadue anni di Igiene" La ripartenza della medicina preventiva e della sanità pubblica nel post-Covid, Lipari, 26-28 May 2022
- Il Pianeta Carcere al Tempo del Covid-19, Pescara 21 October 2022
- Second Workshop on Reproducibility And Replication of Research Results (RRRR), 22 April 2023, Paris, France
- IEEE 36th International Symposium on Computer Based Medical Systems (CBMS), 22-24 June 2023, L'Aquila, Italy

Speaker at Conference

- Aronica, S., Langiu, A., Marzi, F., Mazzola, S., Mignosi, F., and Nazzicone, G. *Compressing big data: When the rate of convergence to the entropy matters*, MACIS 2015
- Marzi, F., Mignosi, F., Rossi, F., Smriglio, S., *Intensity Modulated Proton Therapy by Integer Programming*, EURO 2019
- Di Marco, D., Marzi, F., D'Angelo, A., D'Aloisio, G., Di Marco, A., Stilo, G., *FAIR-EDU: Promote FAIRness in EDUcation Institutions*, Gender Equality & Artificial Intelligence, DSU L'Aquila, 21-22 November 2022
- IEEE 36th International Symposium on Computer Based Medical Systems (CBMS), 22-24 June 2023, L'Aquila, Italy

PhD Student Co-Advisor

- Andrea Bianchi, PhD Student at DISIM

Other Titles

- Nominated teaching assistant and examiner of the course "*Introduction to Computability and Complexity*" for the scientific disciplinary sector INF/01, from the Department Council of DISIM, University of L'Aquila, for the years 2018-2019, 2021-2022, 2022-2023.

- Nominated teaching assistant and examiner of the course "*Information Theory*" for the scientific disciplinary sector INF/01, from the Department Council of DISIM, University of L'Aquila, for the years 2018-2019, 2021-2022, 2022-2023.

- Nominated teaching assistant and examiner of the course "*Information Retrieval*" for the scientific disciplinary sector INF/01, from the Department Council of DISIM, University of L'Aquila, for the years 2021-2022, 2022-2023.

- Nominated teaching assistant and examiner of the course "*Linguaggi di Programmazione e Compilatori*" for the scientific disciplinary sector INF/01, from the Department Council of DISIM, University of L'Aquila, for the years 2021-2022, 2022-2023.

Teaching Activity

- Academic Year 2017/2018 Teaching exercises for the Introduction to Computability and Complexity course, DISIM, University of L'Aquila

- June - July 2016, Teaching exercises for Erasmus students for the Network Design course, DISIM, University of L'Aquila

- Academic Year 2015/2016 Teaching exercises for the Programming Principles and Paradigms course, DISIM, University of L'Aquila

- Academic Year 2014/2015 Teaching exercises for the Bioinformatics course, DISIM, University of L'Aquila

- Academic Year 2014/2015 Teaching exercises for the Introduction to Computability and Complexity course, DISIM, University of L'Aquila

- Academic Year 2014/2015 Teaching exercises for the Information Theory course, DISIM, University of L'Aquila

Co-advisor for:
- Bachelor Degree Thesis in Computer Science of Flavio Furia (advisor Prof. Filippo Mignosi), "*Sulla distanza di 2-Edit*", University of L'Aquila.

- Bachelor Degree Thesis in Computer Science of Simone Bucciarelli (advisor Prof. Filippo Mignosi), "*Pattern matching con preprocessing sul testo*", University of L'Aquila.

- Bachelor Degree Thesis in Computer Science of Marco Pistilli (advisor Prof. Filippo Mignosi), "*String matching con preprocessing sul pattern*", University of L'Aquila.

- Bachelor Degree Thesis in Computer Science of Roberto Felicioni (advisor Prof. Filippo Mignosi), "*Il problema dell'ottimizzazione dei piani di trattamento in protonterapia*", University of L'Aquila.

Languages

Italian: native proficiency

English: professional working proficiency

Technical skills

Research level knowledge of Computability and Complexity Theory, Information Theory, Operational Research, Combinatorial Optimization, Algorithms and Data Structures, Medical Statistics, Data Science and Open data.

Good knowledge of the main optimization solver for linear programming: GLPK, Gurobi, CPLEX.

Good knowledge of Phyton and libraries fo data analysis and visualization such as Numpy, Pandas, Scipy, Matplotlib, Seaborn, Folium, Geopandas

Good knowledge of C, Java, Php, Sql, Html, CSS, Javascript. Knowledge of Matlab, SAS and R

Good knowledge of Ckan data management system

Daily use of the main operating systems (Unix-like, Mac OS, Windows).

Autorizzo al trattamento dei dati personali, in conformità alle disposizioni della legge sulla privacy (D.L.196/03).

L'Aquila, 20 October 2023