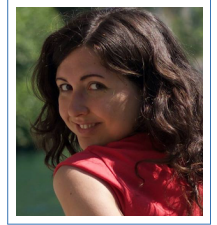# ALICE RAFFAELE

September 22, 2022

Department of Computer Science
University of Verona, Italy
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 Github: aliceraffaele
 Skype: alice_raffaele

Indexed research

ORCID `https://orcid.org/0000-0003-1323-7544`.

Google Scholar `https://scholar.google.com/citations?user=et5m628AAAAJ&hl=it&oi=ao`.

Current position

Postdoctoral researcher and contract professor at the Department of Computer Science of University of Verona, Strada le Grazie 15, 37134 Verona, Italy.

Research interests

Operations research, mathematical programming, combinatorial optimization, temporal networks, mathematics education

Education

Jun, 2018 – Oct, 2018	**24 CFU Teacher Training**, *University of Verona*, Italy. 7 modules in the areas of Pedagogy, Special pedagogy and Didactics of inclusion, Psychology, Anthropology, Teaching methodologies and technologies.
Oct, 2013 – Mar, 2016	**Master of Science, Computer Science Engineering**, *University of Brescia*, Italy, 110/110 cum laude, March 16, 2016. Thesis: "Time constrained Vehicle Routing Problem" Advisor: Prof. Renata Mansini.
Sep, 2010 – Oct, 2013	**Bachelor of Science, Computer Science Engineering**, *University of Brescia*, Italy, 108/110, October 30, 2013. Thesis: "La cifratura omomorfica" (i.e., "The homomorphic encryption") Advisor: Prof. Luca Giuzzi.
Sep, 2005 – Jun, 2010	**High School Scientific Diploma**, *Liceo Scientifico Statale G. Galilei*, Palazzolo sull'Oglio (BS), Italy, 92/100, June, 2010. Thesis: "Alla ricerca di una nuova identità — La figura della donna nella letteratura dalla Rivoluzione Francese in poi" (i.e., "Searching for a new identity – The role of women in literature, from the French Revolution and on").

Research

Apr, 2022 – present	**PostDoc in Operations Research**, *University of Verona*, Italy. Mathematical Programming, Combinatorial Optimization, Algorithms, Temporal networks. Advisor: Prof. Romeo Rizzi
Apr, 2021 – Mar, 2022	**Research fellow in Operations Research**, *University of Verona*, Italy. Mathematical Programming, Combinatorial Optimization, Algorithms, Temporal networks. Advisor: Prof. Romeo Rizzi

Nov, 2017 – **PhD in Mathematics (Operations Research)**, *University of Trento and University of Verona*,
Mar, 2022   Italy.
Combinatorial Optimization, Mathematical Programming, Algorithms.
Thesis: "From optimization to listing: theoretical advances in some enumeration problems".
Advisor: Prof. Romeo Rizzi
Defence date: March 30, 2022.

Visitings

Oct, 2019 – **Visiting researcher**, *National Institute of Informatics*, Tokyo, Japan.
Dec, 2019   Enumeration algorithms and listing problems.
Advisor: Prof. Takeaki Uno.

May, 2019 – **Visiting researcher**, *Université Paris-Est Marne-la-Vallée*, Paris, France.
June, 2019 Bioinformatics and string algorithms (problems related to permutation patterns and graphs). Advisors:
Prof. Stéphane Vialette and Prof. Laurent Bulteau.

Sep, 2015 – **Master thesis intern**, *Université Laval*, Québec City, Canada.
Jan, 2016   Vehicle routing problem and metaheuristics. Advisors: Prof. Jean-François Côté and Prof. Renata Mansini.

Reviewing activity for journals

Sep, 2021 – *Discrete Applied Mathematics*
present

Feb, 2021 – *SN Operations Research Forum*
present

Teaching

Oct, 2022 – **ROAR III (creator, designer, and experimenter)**, *IIS Antonietti, Iseo, Brescia*, Italy.
present   Path for Transversal Skills and Orientation in collaboration with Prof. Marinella Picchi, Dr. Alessandro
Gobbi (University of Brescia), Dr. Eugenia Taranto and Dr. Gabriella Colajanni (University of Catania).
Third part of a three-year project-work to introduce operations research to Grades 10–12. Focus on
implementation and resolution of optimization problems by means of Python and the library PuLP. For
further details, see `https://github.com/aliceraffaele/ROAR`.

Oct, 2022 – **Mathematics for Decisions (contract professor)**, *University of Verona*.
present   Master's degree in *Mathematics* (English, 48 hours).

Mar, 2022 – **Discrete Optimization and Decision Making (contract professor)**, *University of Verona*.
present   Master's degree in *Data Science* (English, 32 hours, classroom + Zoom).

Mar, 2022 – **Operations Research (contract professor)**, *University of Verona*.
Jun, 2022   Bachelor's degree in *Applied Mathematics* (Italian, 8 hours, classroom + Zoom).

Jan, 2022 – **ROAR II (creator, designer, and experimenter)**, *IIS Antonietti, Iseo, Brescia*, Italy.
Apr, 2022   Path for Transversal Skills and Orientation in collaboration with Prof. Marinella Picchi, Dr. Alessandro
Gobbi (University of Brescia), Dr. Eugenia Taranto and Dr. Gabriella Colajanni (University of Catania).
Second part of a three-year project-work to introduce operations research to Grades 10–12. Focus on graph
theory and network applications. For further details, see `https://github.com/aliceraffaele/ROAR`.

Oct, 2021 – **Mathematics for Decisions (contract professor)**, *University of Verona*.
Jan, 2022   Master's degree in *Mathematics* (English, 8 hours, classroom + Zoom).

Mar, 2021 – **ROAR I (creator, designer, and experimenter)**, *IIS Antonietti, Iseo, Brescia*, Italy.
May, 2021   Path for Transversal Skills and Orientation in collaboration with Prof. Marinella Picchi, Dr. Alessandro
Gobbi (University of Brescia), Dr. Eugenia Taranto and Dr. Gabriella Colajanni (University of Catania).
First part of a three-year project-work to introduce operations research to Grades 10–12. Focus on
mathematical modelling, linear and integer programming. For further details, see `https://github.com/`
`aliceraffaele/ROAR`.

Oct, 2020 – **Mathematics for Decisions (teaching assistant)**, *University of Verona*.
Jan, 2021   Master's degree in *Mathematics* (English, 24 hours, classroom + Zoom).

Mar, 2020 – Jun, 2020	**Operations Research (teaching assistant)**, *University of Verona*. Bachelor's degree in *Applied Mathematics* (Italian, 24 hours, Zoom).
Mar, 2020 – Jun, 2020	**Mathematics for Decisions (teaching assistant)**, *University of Verona*. Master's degree in *Mathematics* (English, 24 hours, Zoom).
Sep, 2019	**KidsUniversity (trainer)**, *University of Verona*. Activities for classes of primary and secondary schools (8 hours).
Mar, 2019 – Jun, 2019	**Operations Research (teaching assistant)**, *University of Verona*. Bachelor's degree in *Applied Mathematics* (24 hours).
Nov, 2018 – Dec, 2018	**KidsUniversity (trainer)**, *University of Verona*. *Problem solving in primary schools*. Mathematics and informatics activities in thirteen classes in three primary schools in Bovolone and Dossobuono, Verona (26 hours).
Sep, 2018	**KidsUniversity (trainer)**, *University of Verona*. Activities for classes of primary and secondary schools (14 hours).
Mar, 2018 – Jun, 2018	**Operations Research (teaching assistant)**, *University of Verona*. Bachelor's degree in *Applied Mathematics* (24 hours).
Nov, 2017 – Dec, 2017	**A hands-on tutorial on LP and ILP modeling (lecturer)**, *University of Verona*. Mini-course in the Master's degree in *Mathematics* (20 hours).
Apr, 2016	**Adaptive Large Neighborhood Search (ALNS) (lecturer)**, *University of Brescia*. Tutorial lecture in the *Optimization Algorithms* course by Prof. Renata Mansini (2 hours).

Advising

Jul, 2019 – Mar, 2020	***Enrica Pini* (co-advisor)**, *University of Verona*. Master's thesis in *Mathematics*. Advisor: Prof. Romeo Rizzi.

Publications

Journal Articles

2022	Eugenia Taranto, Gabriella Colajanni, Alessandro Gobbi, Marinella Picchi, and **Alice Raffaele**. Fostering students' development of modelling and problem-solving skills through Operations Research and digital technologies in a collaborative environment. *International Journal of Mathematical Education in Science and Technology*. Taylor and Francis Ltd., 2022. To appear.
2022	Gabriella Colajanni, Alessandro Gobbi, Marinella Picchi, **Alice Raffaele**, and Eugenia Taranto. An Operations Research–Based Teaching Unit for Grade 10: The ROAR Experience, Part I. *INFORMS Transactions on Education*. INFORMS, 2022.
2021	**Alice Raffaele** and Alessandro Gobbi. Teaching Operations Research Before University: A Focus on Grades 9–12. *SN Operations Research Forum*, volume 2, page 13, 2021.
2021	**Alice Raffaele**. Becoming Visible: Why We Should be Better Communicators Now. *SN Operations Research Forum*, volume 2, page 7, 2021.
2021	Lavinia Amorosi, Rossana Cavagnini, Veronica Dal Sasso, Martina Fischetti, Valentina Morandi, and **Alice Raffaele**. Women Just Wanna Have OR: Young Researchers Interview Expert Researchers. *SN Operations Research Forum*, volume 2, page 2, 2021.
2020	Rossana Cavagnini, Veronica Dal Sasso, Valentina Morandi, and **Alice Raffaele**. How to Organize an OR Workshop: the AIROYoung Experience. *SN Operations Research Forum*, volume 1, page 34, 2020.

In Conference Proceedings

2021	Dario Ostuni, **Alice Raffaele**, Romeo Rizzi, and Matteo Zavatteri. Faster and Better Simple Temporal Problems. *Proceedings of the 35th AAAI Conference on Artificial Intelligence*, 2021.

Technical Reports

2019 Jean-François Côté, Renata Mansini, and **Alice Raffaele**. *Tactical Time Window Management in Attended Home Delivery*. CIRRELT, 2019.

2019 Dusan Bikov, Raul Kangro, Harald Kitzmann, Petre Lameski, **Alice Raffaele**, and Zlatko Varbanov. Usage based insurance. European Study Group with Industry – ESGI 151, 2019.

Submitted Works

2022 Matteo Zavatteri, **Alice Raffaele**, Dario Ostuni, and Romeo Rizzi. An Interdisciplinary Experimental Evaluation on the Disjunctive Temporal Problem. Invited revision. *Constraints*, July 2022.

2022 **Alice Raffaele** and Matteo Zavatteri. Reducing the Number of Disjuncts in DTPs. August 2022.

2021 **Alice Raffaele**, Romeo Rizzi, and Takeaki Uno. Listing the bonds of a graph in $\widetilde{O}(n)$-delay. June 2021.

2021 **Alice Raffaele** and Romeo Rizzi. A new decomposition for the Monotone Boolean Duality problem. July 2021.

Working Papers

2022 **Alice Raffaele**, Matteo Zavatteri, Fabio Bazzoli, Marco Gussago, and Romeo Rizzi. A two-phase approach to optimize an interlibrary loan service: the case study of Provincia di Brescia. 2022.

2022 Jean-François Côté, Renata Mansini, and **Alice Raffaele**. Multi-Period Time Window Assignment for Attended Home Delivery. 2022.

2022 Gabriella Colajanni, Alessandro Gobbi, Marinella Picchi, **Alice Raffaele**, and Eugenia Taranto. An Operations Research–Based Teaching Unit for Grade 11: The ROAR Experience, Part II. 2022.

Talks

Conferences

Sep, 2022 *On Vertex Enumeration and Hypergraph Dualization: relevance in combinatorial optimization and a new decomposition approach* at the *International Conference on Optimization and Decision Science*, AIRO–ODS 2022, August 30 – September 02, 2022, Florence, Italy.

Feb, 2022 *The case study of Province of Brescia: analysis, evaluation, and improvement of an interlibrary loan service* at the *6th AIROYoung Workshop – Operations Research and Data Science in Public Services* (6AYW), February 23–25, 2022, Rome (hybrid), Italy.

Sep, 2021 *An Operation Research based Didactic Unit for Grade 10: The ROAR Experience, Part I* at the *International Conference on Optimization and Decision Science*, AIRO–ODS 2021, September 14–17, 2021, Rome, Italy.

Feb, 2021 *Teaching Operations Research Before University: a focus on Grades 9–12* at the *5th AIROYoung Workshop – Optimization and Data Science: Trends and Applications* (4AYW), February 10–12, 2021, Naples (virtual), Italy.

Dec, 2020 *Faster listing of bonds based on biconnectivity* at the *4th International Workshop on Enumeration Problems & Applications*, WEPA 2020, December 6–10, 2020, Haifa (virtual), Israel.

Oct, 2019 *A new decomposition for the Monotone Boolean Duality problem* at the *3rd International Workshop on Enumeration Problems & Applications*, WEPA 2019, October 28–31, 2019, Awaji Island, Japan.

Sep, 2019 *Teaching Operations Research before University* at the *International Conference on Optimization and Decision Science*, AIRO–ODS 2019, September 4–7, 2019, Genova, Italy.

Nov, 2018	*A Joint Generation approach for the Vertex Enumeration Problem* at the *2nd International Workshop on Enumeration Problems & Applications*, WEPA 2018, November 4–8, 2018, Pisa, Italy.
Sep, 2016	*The Stochastic Multi-period Time Windows Assignment Problem* at the *46th Annual Conference of the Italian Operations Research Society*, September 6–9, 2016, Trieste, Italy.

Oct, 2022	*Introduction to graph theory: optimization problems and applications to social networks* for the *OPS4Math project – Optimization and Problem Solving for Teaching of Mathematics*, October 4, 2022, Naples, Italy.
Oct, 2022	*Solving optimization problem with GeoGebra* for the *OPS4Math project – Optimization and Problem Solving for Teaching of Mathematics*, October 4, 2022, Naples, Italy.
Nov, 2019	*A new decomposition for the Monotone Boolean Duality problem* at RIMS, Kyoto University, November 28, 2019, Kyoto, Japan.

Posters

Feb, 2021	*Faster and Better Simple Temporal Problems*, at the *35th AAAI Conference on Artificial Intelligence*, February, 2–9, 2021, Online.

Courses, schools, seminars and workshops

Feb, 2021	*AIRO PhD School 2021 & 5th AIROYoung Workshop – Optimization and Data Science: Trends and Applications* (5AYW), February 8–12, 2021, Naples (virtual), Italy.
Feb, 2020	*4th AIROYoung Workshop: New Advances in Optimization, Machine Learning and Data Science* (4AYW), February 5–7, 2020, Bozen, Italy.
Dec, 2020	*2nd Workshop On Graphs and Geometric Algorithms* (WOGGA2), National Institute of Informatics, Tokyo, Japan, December 16–18, 2019 (20 hours).
Mar, 2019	*Third AIROyoung Workshop and First AIROYoung PhD School on Advanced Methods in Optimization and Data Science* (3AYW), Sapienza University of Rome, Department of Statistics, Rome, Italy, March 26–29 (24 hours).
Mar, 2019	*2nd conference of the EURO Working Group on the Practice of Operations Research*, Bologna, Italy, March 11–12, 2019 (16 hours).
Feb, 2019	*First Estonian Study Group with Industry* (ESGI 151), University of Tartu, Estonia, February 4–8, 2019 (40 hours).
Sep, 2018	*Modeling Week on Data Driven Decision Making and Optimization* (D3EMO), Copenhagen Business School, Denmark, September 03–07, 2018 (40 hours).
Jul, 2018	*Metodologie di osservazione etnografica in aula e nella scuola*. Lecturer: Prof. Elisa Bellato (University of Verona). Verona, July 24, 30–31, 2018 (18 hours).
Jul, 2018	*Elementi di didattica generale*. Lecturer: Prof. Giuseppina Messetti (University of Verona). Verona, July 20–21, 23, 26–28, 2018, (36 hours).
Jul, 2018	*Teorie della scuola e della formazione*. Lecturer: Prof. Daniele Loro (University of Verona). Verona, July 16–18, 2018 (18 hours)
Jul, 2018	*Pedagogia e didattica dell'inclusione* Lecturer: Prof. Angelo Lascioli (University of Verona). Verona, July 11–13, 2018 (18 hours).
Jul, 2018	*Psicologia sociale*. Lecturer: Prof. Sabrina Berlanda (University of Verona). Verona, July 10, July 19 and August 01, 2018 (18 hours)
Jun, 2018 – Jul, 2018	*Psicologia dell'apprendimento scolastico*. Lecturer: Prof. Laura Fontecedro (University of Verona). Verona, June 28–29 and July 02, 2018 (18 hours).

Jun, 2018	*Storia e attuale ordinamento delle istituzioni scolastiche*. Lecturer: Prof. Mario Gecchele (University of Verona). Verona, June 25–27, 2018 (18 hours).
Jun, 2018	*The Applications of Linear Programming*, University of Trento, Italy, June 18–19, 2018 (8 hours).
Jun, 2018	*School on Graph Theory* (SGT 2018), LIRMM, Sète, France, June 11–15, 2018 (36 hours).
May, 2018	*International Spring School on Integrated Operational Problems* (SSIOP), Université de Troyes, France, May 14–16, 2018 (20 hours).
Apr, 2018	*Colouring, Flows and Decompositions of Graphs*. Lecturer: Edita Macajova (Comenius University, Bratislava, Slovacchia), University of Verona, Italy, April 17–26 2018 (12 hours).
Apr, 2018 – May, 2018	*Introduction to Quantum Information*. Lecturer: Dr. Davide Pastorello. Trento, April - May 2018 (20 hours).
Mar, 2018	*Neural Networks for Time Series Analysis*. Lecturer: Oleksandr Honchar (University of Verona), University of Verona, Italy, March 21–29, 2018 (8 hours).
Feb, 2018 – May, 2018	*Stochastic Analysis: From Population Dynamics to Finance*. Lecturers: Prof. Luca Di Persio (University of Verona), Prof. Simone Scotti (University Paris Diderot, France) and Prof. Zenghu Liu (Beijing Normal University, China), Verona, Italy, February – May 2018 (60 hours).
Jan, 2018 – Feb, 2018	*Mathematical Programming*. Lecturer: Prof. Romeo Rizzi. Trento, January 22 – February 02, 2018 (20 hours).
Jan, 2018	*Introduction to SageMath*. Lecturer: prof. Péter Burcsi (Faculty of Informatics, Eötvös Loránd University, Budapest), University of Verona, Italy, January 22–25, 2018 (8 hours).

Industrial experience

Nov, 2016 – Oct, 2017	**IT manager**, *Edelweiss Energia S.p.A., Sarnico, Bergamo*, Italy. Apprenticeship in collaboration with University of Brescia and the Department of Information Engineering. Computer science engineer and system administrator, developer of some internal software, report manager, technical support to other areas of the company.
May, 2016 – Oct, 2016	**Internship**, *Edelweiss Energia S.p.A., Sarnico (Bergamo)*, Italy. Implementation of ETL scripts to automatic download and load data from several sources; learning of the main company tools and software; technical support to other areas of the company.

Collaborations with companies

May, 2019 – present	**Consultant**, *Provincia di Brescia, Brescia*, Italy, Libraries Office.
Oct, 2018 – Mar, 2019	**Consultant**, *Consorzio Agrario del Nordest, Verona*, Italy.
Oct, 2017 – May, 2020	**Consultant**, *InfogestWeb s.r.l., Verona*, Italy. *Joint Project 2018*, granted by the University of Verona on the project entitled *DAVIDE (Development of Algorithms to Verify Infractions of Driving European laws)*. Principal Investigator: Prof. Romeo Rizzi.

Awards and honors

Jul, 2022	Selected as **one of the 104 participants** (among 730+ applications) of the first edition of **EU TalentOn**, an initiative by European Commission addressed to early career researchers between 21 and 35 years old.
Sep, 2016	Awarded of the ***AIRO Prize*** for the best master thesis related to applications during the **46th Annual Conference of the Italian Operations Research Society** in Trieste, Italy, September 6–9, 2016.
May, 2015	Awarded of the ***Journalist for a day*** prize in a national writing contest organized by the National Circuit of School Journalism – AlboScuole in Rome, Italy, May 20, 2015.

Grants

Sep, 2022	**Travel expenses and accommodation** funded by **European Commission** to participate to the first edition of **EU TalentOn** in Leiden, The Netherlands, September 14–18, 2022.
Jan, 2022	Recipient of a **conference grant** funded by **Gruppo Nazionale per il Calcolo Scientifico (GNCS-INdAM)** to attend the *International Conference on Optimization and Decision Science*, AIRO–ODS 2022, August 30 – September 02, 2022, Florence, Italy. 500 €.
Feb, 2019	Recipient of **Cost Action TD1409 Travel Grants** to attend the ***First Estonian Study Group with Industry (ESGI 151)***, University of Tartu, Estonia, February 4–8, 2019. 384.98 €.
Sep, 2018	Recipient of **COST Action TD1409 Travel Grants** to attend the ***Modeling Week on Data Driven Decision Making and Optimization (D3EMO)***, Copenhagen Business School, Denmark, September 3–7, 2018. 400 €.
Nov, 2017 – Mar, 2021	Recipient of the **Italian PhD Scholarship** to attend the PhD course in Mathematics jointly organized by University of Trento and University of Verona. 16350 €/year.
Sep, 2015 – Jan, 2016	Recipient of the **Scholarship of Excellence** funded by Université Laval, Québec, Canada. 4000 CAD.
Sep, 2015 – Jan, 2016	Recipient of the **Thesis Abroad Scholarship** funded by University of Brescia to develop my master's thesis at Université Laval, Québec, Canada. 1500 €.

Positions of responsibility

Feb, 2021 – present	**Coordinator** of AIROYoung (Young Chapter of the Italian Operations Research Society).
Feb, 2020	Member of the **Organizing Committee** of the **4th AIROYoung Workshop**, Free University of Bozen, Italy, February 5–7, 2020
Mar, 2019 – Feb, 2021	**Social media manager and web curator** of AIROYoung.

Memberships

Dec, 2020 – present	Member of **AAAI** (Association of the Advancement of Artificial Intelligence).
Mar, 2019 – present	Member of **AIROYoung** (Young Chapter of the Italian Operations Research Society).
Sep, 2016 – present	Member of **AIRO** (Italian Operations Research Society).

Languages

Italian	Mother tongue
English	Professional proficiency
French	Elementary proficiency

Computer skills

Programming Languages	Python, Java, SQL, C++, C, C#, HTML, Markdown, CSS, PHP, Javascript
Technologies	AMPL, AndroidStudio, Eclipse, Gurobi, LaTeX, MATLAB, Microsoft Office (Word, Excel, Outlook, Powerpoint, Publisher), Microsoft SQL Server, Microsoft Visual Studio, Pentaho Kettle, VMware vSphere, SageMath, SAP Business Objects – Desktop Intelligence, Webratio Platform

Certifications

Apr, 2017	EPEX Spot Certification
Jul, 2016	State Professional Qualifying Examination in Engineering (Esame di Stato per l'abilitazione alla professione di Ingegnere – Sez. A, Ingegneria dell'Informazione)
May, 2009	PET B1 Preliminary
May, 2008	ECDL license

Volunteering

Aug, 2021 – present
MaddMaths! (collaborator and writer).
Main Italian platform for the dissemination of mathematics.
Website: `https://maddmaths.simai.eu`

Jan, 2017 – present
"I MiseraLibri" bookclub (founder and coordinator), *Biblioteca comunale Fausto Sabeo*, Chiari, Brescia, Italy.
Facebook: `https://www.facebook.com/groups/GruppoDiLetturaChiari`
Google Maps: `https://www.google.com/maps/d/u/0/edit?`

Jan, 2021 – Jul, 2021
4th National Meeting of Italian Bookclubs (Creator and member of the organizing committee), Chiari, Brescia, Italy.
Organizer of four Zoom meetings to discuss several typologies and aspects of Italian bookclubs and chair of two of them. Organizer and chair of the 4th National Meeting of Italian Bookclubs, held on June 26th, 2021, at Villa Mazzotti in Chiari (Brescia, Italy)

Mentors

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