

Antonio Maria Sudoso

Research Interests

Optimization, Machine Learning, Time Series.

Education and Current Position

Postdoctoral Researcher

Sapienza University of Rome, Italy

Feb 2022 –

Department of Computer, Control and Management Engineering "A. Ruberti"

PhD degree in Computer Science Control and Geoinformation

University of Rome Tor Vergata, Italy, Laude grade

May 2022

Thesis: "Global Optimization for Machine Learning Applications"

Advisor: Veronica Piccialli

Visiting PhD Student

Alpen-Adria-Universität Klagenfurt, Klagenfurt am Wörthersee, Austria

Jan 2020

Hosted by: Angelika Wiegele, January 2020

Laurea Magistrale (MSc equivalent) in Computer Engineering

University of Rome Tor Vergata, Italy, 110/110 cum laude

Oct 2018

Thesis: "Deep Neural Networks for Time Series Analysis"

Advisors: Paolo Mancuso and Veronica Piccialli

Laurea (BSc equivalent) in Computer Engineering

University of Rome Tor Vergata, Italy, 110/110

Oct 2016

Work Experience

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Data Scientist

July 2021–Dec 2021

I developed optimization algorithms for point cloud registration and segmentation.

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Data Scientist

June 2021–Dec 2021

I developed algorithms for anomaly detection of fish behavior in aquaculture monitoring systems.

Professional Activities

Reviewer for Journals.....

I reviewed manuscripts submitted to the following international journals:

- International Journal of Forecasting, Elsevier (2022)
- Journal of Grid Computing, Springer (2022)

Collaborations.....

I have been involved in collaboration agreements between ENEA and University of Rome Tor Vergata:

- C. La Riccia, V. Piccialli and A. M. Sudoso (PAR 2018, 10.000€). “Clustering di tipologie di abitazione per scegliere modelli di disaggregazione di consumi elettrici realizzati tramite reti deep”.
- G. Oriolo, V. Piccialli and A. M. Sudoso (PAR 2019, 40.000€). “Disaggregazione dei consumi elettrici domestici tramite modelli di machine learning integrati con tecniche di previsione di consumo elettrico”.

Research Output

Journal Papers.....

J4 V. Piccialli, A. M. Sudoso and A. Wiegele (2022). SOS-SDP: An Exact Solver for Minimum Sum-of-Squares Clustering, *INFORMS Journal on Computing*. doi.org/10.1287/ijoc.2022.1166

J3 M. Balletti, V. Piccialli and A. M. Sudoso (2022). Mixed-Integer Nonlinear Programming for State-based Non-Intrusive Load Monitoring, *IEEE Transactions on Smart Grid*. doi.org/10.1109/TSG.2022.3152147

J2 P. Mancuso, V. Piccialli and A. M. Sudoso (2021). A machine learning approach for forecasting hierarchical time series, *Expert Systems with Applications*, 182, 115102. doi.org/10.1016/j.eswa.2021.115102

J1 V. Piccialli and A. M. Sudoso (2021). Improving Non-Intrusive Load Disaggregation through an Attention-Based Deep Neural Network, *Energies*, 14(4), 847. doi.org/10.3390/en14040847

Submitted Papers.....

S1 V. Piccialli, A. Russo Russo and A. M. Sudoso (2021). An Exact Algorithm for Semi-supervised Minimum Sum-of-Squares Clustering. <https://arxiv.org/abs/2111.15571>

Teaching

Teaching Assistant.....

As PhD Student, I was involved in the following teaching activities:

- Machine Learning (from 2018/2019 to 2020/2021), MSc in Computer Engineering, University of Rome Tor Vergata.
- Optimization Methods for Big Data (from 2018/2019 to 2020/2021), MSc in Computer Engineering, University of Rome Tor Vergata.

Regular Courses.....

- Hands-on Laboratory of Machine Learning (2018-2019), 1st level Master degree in Data Science, University of Rome Tor Vergata, 16 hours.
- Hands-on Laboratory of Machine Learning (2019-2020), 1st level Master degree in Data Science, University of Rome Tor Vergata, 16 hours.
- Hands-on Laboratory of Machine Learning (2020-2021), advanced course in Data Science for the employees of *Corte dei Conti*, University of Rome Tor Vergata, 16 hours.

- Hands-on Laboratory of Machine Learning (2020-2021), 1st level Master degree in Data Science, University of Rome Tor Vergata, 16 hours.
- PhD Course on Advances in Operations Research (ABRO 2022), Clustering and Optimization, Sapienza University of Rome, 2 hours.

Thesis Supervision.....

I have co-supervised 11 *Laurea Magistrale* (MSc) theses.

Talks

2021 Machine Learning NeEDS Mathematical Optimization, YOUNG Seminar Series <https://congresso.us.es/mlneedsmo/>, *SOS-SDP: an Exact Solver for Minimum Sum-of-Squares Clustering*.

2021 SIAM Conference on Optimization (OP21), SDP Approaches to Combinatorial and Global Optimization, *An SDP-based approach for minimum sum-of-square clustering*.

2021 International Conference on Optimization and Decision Sciences (ODS21), Data Science, *SOS-SDP: an Exact Solver for Minimum Sum-of-Squares Clustering*.

Awards and Grants

2021 Winner of \$1000 Google Cloud Research Credits program with the funding number GCP19980904 for the research project *Global Optimization for Semi-supervised Sum-of-Squares Clustering*.

Schools and Workshops

2019 Optimization, Big Data and Applications (OBA19), Summer School, Veroli, Italy.

2020 New Advances in Optimization, Machine Learning and Data Science, 4th AIROYoung Workshop, Bozen, Italy.

2021 EUROPT Summer School 2021, Summer School, Online.