CHRISTIAN CAPEZZA

Assistant Professor (non-tenure-track) of Statistics
Department of Industrial Engineering, University of Naples Federico II

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EXPERIENCE

Assistant Professor (non-tenure-track, RTDa)   *Dec 2021 - Present*
University of Naples Federico II, Department of Industrial Engineering
Research on statistical process monitoring, functional data analysis, active learning, teaching MSc- and PhD-level courses.

Postdoctoral Researcher   *Nov 2020 - Nov 2021*
University of Naples Federico II, Department of Industrial Engineering
Conducted research on interpretable statistical methods for the analysis of complex systems in Industry 4.0.

Postgraduate Researcher   *May 2020 - Sep 2020*
University of Naples Federico II, Department of Industrial Engineering
Conducted research on functional data analysis for real-time statistical monitoring of multivariate profiles.

VISITING

Short-Term Scholar   *Mar 2025 - Apr 2025*
Georgia Tech, H. Milton Stewart School of Industrial & Systems Engineering
Conducted research on active learning for process monitoring, with prof. Kamran Paynabar.

Visiting Postgraduate Research Student   *Mar 2019 - Sep 2019*
University of Bristol, School of Mathematics
Conducted research on model stacking using generalized additive models, with dr. Matteo Fasiolo and prof. Simon N. Wood.

Visiting PhD Scholar   *Sep 2017 - July 2018*
University of Padova, Department of Statistics
Attended one-year courses of the PhD program in Statistics.

Visiting Graduate Research Student   *Sep 2013 - Oct 2013*
Technical University of Denmark, Department of Civil and Mechanical Engineering
Conducted research on surface metrology, with prof. Leonardo De Chiffre.

EDUCATION

PhD In Industrial Engineering (Doctor Europaeus)   *Feb 2017 - Apr 2020*
University of Naples Federico II, Department of Industrial Engineering
Statistical Methods for Industrial Process Monitoring Based on Functional Data Analysis.
Final grade: Excellent Cum Laude

MSc in Engineering Management   *Oct 2016*
University of Naples Federico II, Department of Industrial Engineering
Partial least-squares approach for ship fuel consumption monitoring and fault detection.
Final grade: 110/110 cum laude.

BSc in Engineering Management for Logistics and Production   *Mar 2013*
University of Naples Federico II, Department of Industrial Engineering
Final grade: 107/110.

PUBLICATIONS

PUBLICATIONS ON REFERRED JOURNALS

- Capezza, C., Centofanti, F., Forcina, D., Lepore, A., Palumbo, B. (2025) "Functional Mixture Regression Control Chart," accepted for publication in *The Annals of Applied Statistics*,
https://arxiv.org/abs/2410.20138.

- Capezza, C., Lepore, A., Paynabar, K. (2025) "Stream-Based Active Learning for Process Monitoring," *Technometrics*,
doi:10.1080/00401706.2025.2561744.

- Capezza, C., Capizzi, G., Centofanti, F., Lepore, A., Palumbo, B. (2025) "An Adaptive Multivariate Functional EWMA Control Chart," *Journal of Quality Technology*, 57(1):1–15,
doi:10.1080/00224065.2024.2383674.

- Capezza, C., Centofanti, F., Lepore, A., Palumbo, B. (2024) "Robust Multivariate Functional Control Chart,"
Technometrics, 66(4):531–547,
doi:10.1080/00401706.2024.2327346.

- Capezza, C., Centofanti, F., Lepore, A., Menafoglio, A., Palumbo, B., Vantini, S. (2023) "funcharts: Control charts for multivariate functional data in R," *Journal of Quality Technology*, 55(5):566–583,
doi:10.1080/00224065.2023.2219012.

- Capezza, C., Centofanti, F., Lepore, A., Menafoglio, A., Palumbo, B., Vantini, S. (2022) "Functional regression control chart for monitoring ship CO_2 emissions," *Quality and Reliability Engineering International*, 38(3):1519–1537,
doi:10.1002/qre.2949.

- Capezza, C., Palumbo, B., Goude Y., Wood, S.N., Fasiolo, M. (2021) "Additive Stacking for Disaggregate Electricity Demand Forecasting," *The Annals of Applied Statistics*, 15(2):727–746,
doi:10.1214/20-AOAS1417.

- Capezza, C., Centofanti, F., Lepore, A., Palumbo, B. (2021) "Functional clustering methods for resistance spot welding process data in the automotive industry," *Applied Stochastic Models in Business and Industry*, 37(5):908–925,
doi:10.1002/asmb.2648.

- Capezza, C., Centofanti, F., Lepore, A., Palumbo, B. (2021) "A Functional Data Analysis Approach for the Monitoring of Ship CO_2 Emissions," *Gestão & Producão*, 28(3),
doi:10.1590/1806-9649-2021v28e152.

- Capezza, C., Lepore, A., Menafoglio, A., Palumbo, B., Vantini, S. (2020) "Control charts for monitoring ship operating conditions and CO_2 emissions based on scalar-on-function regression," *Applied Stochastic Models in Business and Industry*, 36(3):477–500,
doi:10.1002/asmb.2507.

- Reis, M. S., Rendall, R., Palumbo, B., Lepore, A., Capezza, C. (2020) "Predicting ships' CO_2 emissions using featureoriented methods," *Applied Stochastic Models in Business and Industry*, 36(1):110–123,
doi:10.1002/asmb.2477.

- Capezza C., Coleman S., Lepore A., Palumbo B., Vitiello L. (2019) "Ship fuel consumption monitoring and fault detection via partial least squares and control charts of navigation data," *Transportation Research Part D: Transport and Environment*, 67:375–387
doi:10.1016/j.trd.2018.11.009.

- Lepore, A., Palumbo, B., Capezza, C. (2019) "Orthogonal LS-PLS approach to ship fuel-speed curves for supporting decisions based on operational data," *Quality Engineering*, 31(3):386–400,
doi:10.1080/08982112.2018.1537445.

- Lepore, A., Palumbo, B., Capezza, C. (2018) "Analysis of profiles for monitoring of modern ship performance via partial least-squares methods," *Quality and Reliability Engineering International*, 34:1424–1436,
doi:10.1002/qre.2336.

- Lepore, A., Reis, M.S., Palumbo, B., Rendall, R., Capezza, C. (2017) "A comparison of advanced regression techniques for predicting ship CO_2 emissions," *Quality and Reliability Engineering International*, 33:1281–1292,
doi:10.1002/qre.2171.

CHAPTERS IN BOOKS

- Capezza, C., Centofanti, F., Lepore, A., Palumbo, B., (2024) "Robust Statistical Monitoring of a Resistance Spot Welding Process." *Wiley StatsRef: Statistics Reference Online*,
doi:10.1002/9781118445112.stat08467.

- Capezza, C., Centofanti, F., Lepore, A., Menafoglio, A., Palumbo, B., Vantini, S. (2024), "Statistical process monitoring methods based on functional data analysis." In: Gaw, N., Pardalos, P.M., Gahrooei M.R. (eds.) *Multimodal and Tensor Data Analytics for Industrial Systems Improvement*, 211:41–55. Springer, Cham. ISBN 9783031530913,
doi:10.1007/978-3-031-53092-0_4.

- Capezza, C., Centofanti, F., Lepore, A., Menafoglio, A., Palumbo, B., Vantini, S. (2023) "Functional Regression Control Charts with an Application to Ship Fuel Consumption Monitoring." *Wiley StatsRef: Statistics Reference Online*,
doi:10.1002/9781118445112.stat08371.

- Lepore, A., Palumbo, B., Capezza, C. (2018) "An empirical approach to monitoring CO_2 emissions via Partial Least-Squares regression." Perna, C., Pratesi, M., Ruiz-Gazen, A. (Eds.), *Studies in Theoretical and Applied Statistics*, Springer, ISBN 9783319739069,
doi:10.1007/978-3-319-73906-9_20

PAPERS IN CONFERENCE PROCEEDINGS (PRESENTER UNDERLINED)

- Capezza, C., Forcina, D., Lepore, A., Palumbo, B. (2025) "Real-Time Covariance Monitoring for Multichannel Profiles." *Proceedings of the Conference of the Italian Statistical Society*, Genova, Italy, 16–18 June. ISBN: 978-3-031-96303-2.

- Capezza, C., Forcina, D., Lepore, A., Palumbo, B. (2025) "Monitoring the Covariance of Multichannel Profiles." In *Proceedings of the International Workshop on Functional and Operatorial Statistics*, Novara, Italy, 25–27 June. ISBN: 78-3-031-92382-1.

- Capezza, C., Centofanti, F., Forcina, D., Lepore, A., Palumbo, B. (2025) "A Mixture Regression Framework for Profile Monitoring." In *Proceedings of the Third Conference of the Statistics and Data Science (SdS) Group of the Italian Statistical Society (SIS)*, Milano, 2–3 April.

- Capezza, C., Capizzi, G., Centofanti, F., Lepore, A., Palumbo, B. (2024). "An EWMA Control Chart for Multivariate Functional Data." In A. Pollice & P. Mariani (Eds.), Methodological and Applied Statistics and Demography III, pp. 328-333. Springer. ISBN: 978-3-031-64430-6. doi:10.1007/978-3-031-64431-3. *Proceedings of 52nd Scientific Meeting of the Italian Statistical Society (SIS 2024)*, Bari, Italy, June 17-20, 2024.

- Tascione, A. M., Di Costanzo, L., Forcina, D., Pariota, L., Capezza, C., Simonelli, F. (2024) "Correlation of OD Matrix and Traffic Volume with Functional Data Analysis: A Simulation-Based Case Study in the City of Portici," *Proceedings of the 2024 IEEE International Conference on Environment and Electrical Engineering and 2024 IEEE Industrial and Commercial Power Systems Europe (EEEIC / I&CPS Europe))*, Rome, Italy, 17–20 June, doi:10.1109/EEEIC/ICPSEurope61470.2024.10751310.

- Capezza, C., Centofanti, F., Lepore, A., Palumbo, B. (2023) "Robust Statistical Process Monitoring of Multivariate Functional Data." *Proceedings of the Conference of the Italian Statistical Society*, Ancona, Italy, 21–23 June, ISBN: 9788891935618AAVV.

- Capezza, C., Centofanti, F., Lepore, A., Palumbo, B. (2023) "A Robust Approach to Profile Monitoring." (*invited* paper) *Proceedings of the Statistics and Data Science Conference*, Pavia, Italy, 27–28 April, ISBN: 978-88-6952-170-6.

- Capezza, C., Centofanti, F., Lepore, A., Menafoglio A., Palumbo, B., Vantini, S. (2022) "An R package for the statistical process monitoring of functional data." *Proceedings of the Conference of the Italian Statistical Society*, Caserta, Italy, 22–24 June, ISBN: 9788891932310.

- Capezza, C., Centofanti, F., Lepore, A., Palumbo, B. (2022) "Interpretability in functional clustering with an application to resistance spot welding process in the automotive industry." *Proceedings of the Conference of the Italian Statistical Society*, Caserta, Italy, 22–24 June, ISBN: 9788891932310.

- Capezza, C., Palumbo B., Goude Y., Wood S.N., Fasiolo M. (2021) "Forecasting electricity demand of individual customers via additive stacking." . *Proceedings of the Conference of the Italian Statistical Society*, Pisa, Italy, 21–25 June, ISBN: 9788891927361.

- Capezza, C. (2020) "Statistical process monitoring of multivariate profiles from ship operating conditions." (**invited** paper) *Proceedings of the Conference of the Italian Statistical Society*, Pisa, Italy, 22–24 June, ISBN: 9788891910776.

- Capezza, C., Lepore, A., Menafoglio, A., Palumbo, B., Vantini, S. (2019) "Functional control charts for monitoring ship operating conditions and CO_2 emissions based on scalar-on-function linear model." *Proceedings of the conference "Smart Statistics for Smart Applications" of the Italian Statistical Society*, Milano, Italy, 18–21 June, ISBN: 9788891915108.

- Lepore, A., Palumbo, B., Capezza, C. (2017) "Monitoring ship performance via multi-way partial least-squares analysis of functional data." *Proceedings of the Conference of the Italian Statistical Society "Statistics and Data Science: new challenges, new generations"*, Florence, Italy, 28–30 June, ISBN: 9788864535210.

- Reis, M.S., Palumbo, B., Lepore, A., Rendall, R., Capezza, C. (2017) "On the use of predictive methods for ship fuel consumption analysis from massive on-board operational data." *Proceedings of the Conference of the Italian Statistical Society "Statistics and Data Science: new challenges, new generations"*, Florence, Italy, 28–30 June, ISBN: 9788864535210.

ABSTRACTS IN CONFERENCE PROCEEDINGS (PRESENTER UNDERLINED)

- Capezza, C., Forcina, D., Lepore, A., Palumbo, B. (2025) "Detecting covariance shifts in multichannel profiles." *Proceedings of the 19th International Conference on Computational and Financial Econometrics and Computational and Methodological Statistics*, Birkbeck, University of London, UK, 13–15 December. ISBN: 78-9925-7812-9-4

- Capezza, C., Lepore, A., Paynabar, K. (2025) "Active Learning for Data Stream Monitoring." (**invited**) *Proceedings of the 2025 INFORMS Annual Meeting*, Atlanta, GA, USA, 26–29 October.

- Capezza, C., Forcina, D., Lepore, A., Palumbo, B. (2025) "Monitoring Covariance Shifts in Streaming Multichannel Profiles." *Proceedings of the 2025 INFORMS Annual Meeting*, Atlanta, GA, USA, 26–29 October.

- Capezza, C., Forcina, D., Lepore, A., Palumbo, B. (2025) "Online Detection of Covariance Changes in Multichannel Profiles." *Proceedings of International Society for Business and Industrial Statistics (ISBIS) Conference 2025*, University of Amsterdam, Netherlands, 2–3 October.

- Capezza, C., Forcina, D., Lepore, A., Palumbo, B. (2025) "Real-time Detection of Covariance Shifts in Multichannel Profiles." *Proceedings of the 25th annual conference of the European Network for Business and Industrial Statistics (ENBIS)*, Piraeus, Greece, 14–18 September.

- Capezza, C., Cesaro, G., Lepore, A., Palumbo, B., Rossi, E. (2025) Statistical Process Monitoring of Electric Battery Systems on High-Speed Trains through Compositional Data Analysis, *Proceedings of the 25th annual conference of the European Network for Business and Industrial Statistics (ENBIS)*, Piraeus, Greece, 14–18 September.

- Capezza, C., Lepore, A., Paynabar, K. (2025) "Active Learning for Budget-Constrained Labeling in Data Stream Monitoring ", *Proceedings of the 25th annual conference of the European Network for Business and Industrial Statistics (ENBIS)*, Piraeus, Greece, 14–18 September.

- Capezza, C., Lepore, A., Paynabar, K. (2025) "Active Learning for Sequential Classification with Partial Labels." *Proceedings of the 15-th Scientific Meeting Classification and Data Analysis Group (CLADAG)*, University of Naples Federico II, Italy, 8–10 September 2025, Naples, Italy. ISBN: 978-88-99594-24-4.

- Capezza, C., Capizzi, G., Centofanti, F., Lepore, A., Palumbo, B. (2025). "An Adaptive EWMA Control Chart for Monitoring Multivariate Functional Data." (**invited**) *Proceedings of the XVth International Workshop on Intelligent Statistical Quality Control*, Lisbon, Portugal, 14–17 July.

- Capezza, C., Lepore, A., Paynabar, K. (2025) "Active Learning in Process Monitoring Using Streaming Data", *Proceedings of the International Symposium on Statistical Process Monitoring (ISSPM) 2025*, University of Naples Federico II, Naples, Italy, 7–11 July.

- Capezza, C. (2025) Participation to the round table "AURORA: sustAinable aUgmented pRoducts for spORts and sAfety" (**invited panelist**), Made in Italy Innovation Forum, (Italy's largest event on manufacturing innovation) and organized in the framework of the MICS - Made in Italy Circular and Sustainable project. Participated as an invited expert in the panel moderated by Teodorico Caporaso and Andrea Genovese (University of Naples Federico II), contributing to the discussion on sustainable and augmented products for sports and safety. Cernobbio, 23–25 June.

- Capezza, C., Forcina, D., Lepore, A., Palumbo, B. (2025) "Detecting Covariance Shifts in Multichannel Profiles." *Proceedings of the International Symposium on Statistical Process Monitoring (ISSPM) 2025*, University of Naples Federico II, Naples, Italy, 7–11 July.

- Capezza, C., Centofanti, F., Lepore, A., Palumbo, B. (2025) "Robust Multivariate Functional Control Chart." (**invited** at the Technometrics session) *Proceedings of the 2025 Quality and Productivity Research Conference*, Seattle, WA, 15–18 June.

- Capezza, C. (2024) "A tutorial on control charts for multivariate functional data with the funcharts R package." *ENBIS online webinar*, 12 July.

- Capezza, C., Forcina, D., Lepore, A., Longobardi, M., Palumbo, B., Pariota, L., Simonelli, F. (2024) "Statistical Analysis of Traffic Flow Profiles through Functional Graphical Models." *Proceedings of the 24th annual conference of the European Network for Business and Industrial Statistics (ENBIS)*, Leuven, Belgium, 15–19 September.

- Capezza, C., Capizzi, G., Centofanti, F., Lepore, A., Palumbo, B. (2024) "An Adaptive EWMA Monitoring Scheme for Multivariate Functional Data." *Proceedings of the 24th Annual Conference of the European Network for Business and Industrial Statistics (ENBIS)*, Leuven, Belgium, 15–19 September.

- Capezza, C., Centofanti, F., Lepore, A., Palumbo, B. (2024) "Robust Statistical Process Monitoring of Multivariate Profiles." (**invited**) *Proceedings of the 7th International Conference on Econometrics and Statistics (EcoSta 2024)*, Beijing, China, 17–19 July, ISBN: 978-9925-7812-3-2.

- Capezza, C., Capizzi, G., Centofanti, F., Lepore, A., Palumbo, B. (2024) "A Novel Multivariate Functional EWMA Control Chart for Profile Monitoring." *Proceedings of the 2nd INFORMS Conference on Quality, Statistics, and Reliability*, Como, Italy, July 1–4.

- Capezza, C., Centofanti, F., Lepore, A., Palumbo, B. (2024) "A Robust Statistical Process Monitoring Framework for Multivariate Functional Quality Characteristics." *Proceedings of the 2nd INFORMS Conference on Quality, Statistics, and Reliability*, Como, Italy, July 1–4.

- Capezza, C., Centofanti, F., Lepore, A., Palumbo, B. (2024) "An outlier-resistant multivariate profile monitoring framework for a spot welding process in the automotive industry." *Proceedings of the Joint Research Conference 2024*, Waterloo, Canada, 17–20 June.

- Capezza, C., Centofanti, F., Lepore, A., Palumbo, B. (2024) "A Robust Multivariate Profile Monitoring Framework." *Proceedings of the ENBIS Spring Meeting*, Dortmund, Germany, 15–16 May.

- Capezza, C. (2024) "L'impatto dei metodi statistici per dati funzionali in ambito Industria 4.0." (**invited**) *Statistica e Data Science per il Business*, Padova, Italy, 3 May.

- Capezza, C., Centofanti, F., Forcina, D., Lepore, A., Palumbo, B. (2023) "Control charts for functional data based on functional mixture regression." (**invited**) *Proceedings of the 16th International Conference of the ERCIM WG on Computational and Methodological Statistics (CMStatistics 2023)*, Berlin, Germany, 16–18 December, ISBN: 978-9925-7812-7-0.

- Capezza, C. (2023) "Advancements in Statistical Process Monitoring of Multivariate Functional Data in Industry 4.0." (**invited**) *StaTalk 2023*, Rome, 15 September 2023.

- Capezza, C., Centofanti, F., Lepore, A., Palumbo, B. (2023) "Monitoring Resistance Spot Welding Profiles via Robust Control Charts." *Proceedings of the 23rd Annual Conference of the European Network for Business and Industrial Statistics (ENBIS)*, Valencia, Spain, 10–14 September, ISBN: 978-84-125444-9-7.

- Capezza, C., Centofanti, F., Forcina, D., Lepore, A., Palumbo, B. (2023) "Resistance Spot Welding Process Monitoring Through Mixture Function-on-scalar Regression Analysis." *Proceedings of the 23rd Annual Conference of the European Network for Business and Industrial Statistics (ENBIS)*, Valencia, Spain, 10–14 September, ISBN: 978-84-125444-9-7.

- Capezza, C., Centofanti, F., Lepore, A., Palumbo, B. (2022) "Robust Control Charts for Multivariate Functional Data." (**invited**) *Proceedings of the 15th International Conference of the ERCIM WG on Computational and Methodological Statistics (CMStatistics 2022)*, London, UK, 17–19 December, ISBN: 978-9925-7812-6-3.

- Capezza, C., Centofanti, F., Lepore, A., Palumbo, B. (2022) "Robust Multivariate Functional Control Charts." *Proceedings of the 2022 INFORMS Annual Meeting*, Indianapolis, IN, USA, 15–19 October.

- Enticott, E., Fasiolo, M., Capezza, C., Goude, Y. (2022) "Scalable additive stacking models for electricity demand forecasting." (**invited**) *Proceedings of European Conference on Data Analysis 2022, ECDA2022*, Naples, Italy, 14–16 September.

- Capezza, C., Palumbo, B., Goude Y., Wood, S.N., Fasiolo, M. (2022) "Probabilistic forecasting of electricity demand via additive stacking." (**invited**) *Proceedings of the International Society for Business and Industrial Statistics (ISBIS) Conference 2022 on Statistics and Data Science in Business and Industry*, University of Naples Federico II, Naples, Italy, 20–21 June, ISBN: 979-12-210-1389-4.

- Capezza, C., Centofanti, F., Lepore, A., Palumbo, B. (2022) "Functional clustering techniques applied to Resistance Spot Welding curves in the Automotive Industry 4.0." *Proceedings of the International Society for Business and Industrial Statistics (ISBIS) Conference 2022 on Statistics and Data Science in Business and Industry*, University of Naples Federico II, Naples, Italy, 20–21 June, ISBN: 979-12-210-1389-4.

- Capezza, C., Centofanti, F., Lepore, A., Menafoglio A., Palumbo, B., Vantini, S. (2022) "Statistical process control of multivariate functional data in R." *Proceedings of the 22nd Annual Conference of the European Network for Business and Industrial Statistics (ENBIS)*, Trondheim, Norway, 26–30 June, ISBN: 978-82-303-5470-4.

- Capezza, C., Centofanti, F., Lepore, A., Menafoglio A., Palumbo, B., Vantini, S. (2021) "funcharts: An R package for the real-time monitoring of multivariate functional data." (**invited**) *Proceedings of the 15th International Conference on Computational and Financial Econometrics (CFE 2019) and 14th International Conference of the ERCIM (European Research Consortium for Informatics and Mathematics) Working Group on Computational and Methodological Statistics (CMStatistics 2019)*, London, UK, 18–20 December, ISBN: 978-9925-7812-5-6.

- Fasiolo, M., Capezza, C., Goude Y., Palumbo, B., Wood, S.N. (2021) "Generalized additive models for ensemble electricity demand forecasting.." *Proceedings of the European Network for Business and Industrial Statistics (ENBIS)-21 Online Conference*, 13–15 September, ISBN: 979-12-20093-98-9.

- Capezza, C., Centofanti, F., Lepore, A., Palumbo, B. (2021) "Analysis of resistance of spot welding process data in the automotive industry via functional clustering techniques." *Proceedings of the European Network for Business and Industrial Statistics (ENBIS)-21 Online Conference*, 13–15 September, ISBN: 979-12-20093-98-9.

- Capezza, C., Palumbo, B., Goude Y., Wood, S.N., Fasiolo, M. (2021) "Probabilistic expert aggregation via additive stacking." (**invited**) *JDS 2021 : 52èmes Journées de Statistique de la Société Française de Statistique (SFdS)*, Nice, France, 7–11 June.

- Capezza, C., Lepore, A., Menafoglio A., Palumbo, B., Vantini, S. (2019) "Functional control charts based on scalar-on-function linear model." (**invited**) *Proceedings of the 13th International Conference on Computational and Financial Econometrics (CFE 2019) and 12th International Conference of the ERCIM (European Research Consortium for Informatics and Mathematics) Working Group on Computational and Methodological Statistics (CMStatistics 2019)*, London, UK, 14–16 December, ISBN: 978-9963-2227-8-0.

- Bocchetti, D., Capezza, C., Coleman, S., Lepore, A., Palumbo, B., Reis, M.S., Rendall, R., Vitiello, L. (2019) "Statistical Engineering Challenges from Big Data in Shipping Industry." *Proceedings of the 19th Annual Conference of the European Network for Business and Industrial Statistics (ENBIS)*, Budapest, Hungary, 2–4 September, ISBN: 78-963-489-146-8.

- Bocchetti, D., Capezza, C., Lepore, A., Palumbo, B., Rendall, R., Reis, M.S. (2018) "Predicting CO_2 Emissions from Maritime Transport with Feature-Oriented Methods." *Proceedings of the 18th Annual Conference of the European Network for Business and Industrial Statistics (ENBIS)*, Nancy, France, 2–6 September, ISBN: 78-961-240-340-9.

- Capezza, C., Lepore, A., Menafoglio A., Palumbo, B., Vantini, S. (2018) "Monitoring ship CO_2 emissions from operating conditions via functional control charts and scalar-on-functional linear models." *Joint Meeting of SIS SDS Group and itENBIS*, Torino, Italy, 24–25 May.

- Bocchetti, D., Lepore, A., Palumbo, B., Capezza, C., Centofanti, F. (2017) "Normalized Ship Fuel-Speed Curve for Monitoring CO_2 Emissions by Multi-Sensor System Data." *Proceedings of the 17th Annual Conference of the European Network for Business and Industrial Statistics (ENBIS)*, Naples, Italy, 9–14 September, ISBN: 9789612403225.

- Bocchetti, D., Capezza, C., Centofanti, F., Lepore, A., Di Matteo, R., Palumbo, B., Vitiello, L. (2017) "A Statistical Framework for Monitoring, Reporting and Verification of CO_2 Emissions in the Maritime Transport." *Proceedings of the 17th Annual Conference of the European Network for Business and Industrial Statistics (ENBIS)*, Naples, Italy, 9–14 September, ISBN: 9789612403225.

- D'Ambra, A., Lepore, A., Palumbo, B., Vitiello, L., Capezza, C. (2016) "Case studies on PLS-based procedure for ship fuel consumption monitoring and fault detection." *Proceedings of the 16th Annual Conference of the European Network for Business and Industrial Statistics (ENBIS)*, Sheffield, UK, 11–15 September, ISBN: 9789612403072.

- Palumbo, B., Erto, P., Lepore, A., Vitiello, L., Capezza, C., Bocchetti, D., D'Ambra, A., Antonelli, B. (2016) "Ship fuel consumption control and engineering approach to fault-detection." *Proceedings of the 48th Meeting of the Italian Statistical Society*, Salerno, Italy, 8–10 June, ISBN: 9788861970618.

SOFTWARE

R packages:

- CRAN packages: `funcharts` (creator), `ActiveLearning4SPM` (creator), `mgcViz` (contributor)

- GitHub packages: `gamfactory` (author)

AWARDS

18 Nov 2025:   Winner of the Departmental Research Project Call reserved for Fixed-Term Type A Researchers (RTD-A) at the Department of Industrial Engineering, University of Naples Federico II - April 2025 Edition (ranked 1st out of 9 submitted projects), awarded a grant of € 20,000. Role: Principal Investigator, leading a team composed of Davide Forcina (PhD student in Industrial Engineering at the University of Naples Federico II) and Prof. Kamran Paynabar (H. Milton Stewart School of Industrial and Systems Engineering, Georgia Tech). The proposal was ranked 1st among 9 competing projects

4 Jun 2025:   Winner of the Data Challenge of the ICQSR 2025 Conference in Singapore, together with Davide Forcina and Antonio Lepore.

21 Feb 2025:   Awarded the Prize for Environmental Impact at MICSATHLON for outstanding contributions to sustainable innovation and industrial excellence.

1 Feb 2023:   Obtained the National Scientific Qualification (Abilitazione Scientifica Nazionale) for the position of Associate Professor.

13 Dec 2019:   Best image segmentation achieved in the Tutorial "Clustering methods for Image Analysis" of the 12th International Conference of the ERCIM WG on Computational and Methodological Statistics (CMStatistics 2019), Senate House, University of London, 14-16 December 2019.

May 2000:   3rd place in the Kangourou Mathematics Competition at the school level during middle school. Category: Benjamin (11-12 years old)

PEER-REVIEWING ACTIVITY

Reviewer for the following international journals:
Technometrics ● Journal of Quality Technology ● Journal of the Royal Statistical Society: Series C (Applied Statistics) ● INFORMS Journal on Data Science ● Statistics and Computing ● IEEE Transactions on Neural Networks and Learning Systems ● Statistical Methods and Applications ● Quality and Reliability Engineering International ● Statistica Applicata - Italian Journal of Applied Statistics ● Engineering Applications of Artificial Intelligence ● Mathematics ● Environmetrics

TEACHING

MSc Degree Courses:

- **Statistical Methods for Industrial Process Monitoring**, 6 CFU, 48 hours
  MSc in Mathematical Engineering and MSc in Data Science, University of Naples Federico II
  Academic years 2023/24, 2024/25, 2025/26.

- **Statistical Models for Marine Technology Innovation**, 9 hours
  Sustainable Ship and Shipping (SEAS) 4.0 Erasmus Mundus Joint Master Degree, University of A Coruña
  Academic years 2021/22, 2022/23 (online), 2023/24, 2024/25.

PhD Courses:

- **Statistical Process Monitoring of Complex Engineering Data**, 8 hours
  PhD in Industrial Engineering, University of Naples Federico II, 2022

- **Statistical Process Monitoring of High-Dimensional Engineering Data**, 12 hours
  PhD in Industrial Engineering, University of Naples Federico II, 2025, 2026

  Other courses:

- **Statistical Process Monitoring of Functional Data**, 4 hours.
  ECAS-ENBIS Course, course held at ENBIS-25 Conference, Piraeus, Greece (joint initiative of ENBIS and ECAS), 14 September 2025. Delivered a 4-hour applied course on modern statistical process monitoring techniques for functional data, with a focus on industrial applications. The course covered smoothing methods, multivariate functional principal component analysis, and control charts for functional data.

MSC THESIS SUPERVISION

THESIS SUPERVISOR (RELATORE)

University of Naples Federico II

- **Elena Abate**, MSc in Aerospace Engineering, a.y. 2024–2025.
  Statistical Analysis of Guided Waves for Damage Detection in Composite Panels.

- **Gopikrishnan Sanal**, Erasmus Mundus Joint Master's Degree in Sustainable Ship and Shipping (SEAS 4.0), a.y. 2024–2025.
  Machine Learning in Ship Energy Efficiency.

- **Malaz Adam Mohamedain**, MSc in Mathematical Engineering, a.y. 2023–2024.
  Statistical Analysis of Traffic Profiles through Functional Graphical Models.

- **Alphie Benhard Sori Mangapul Manullang**, Erasmus Mundus Joint Master's Degree in Sustainable Ship and Shipping (SEAS 4.0), a.y. 2023–2024.
  Assessing vessel transit time by statistical quality control: the expanded Panama canal case study.

- **Kartik Garg**, Erasmus Mundus Joint Master's Degree in Sustainable Ship and Shipping (SEAS 4.0), a.y. 2023–2024.
  Statistical modelling of carbon emissions in vessels.

- **Pritam Kumar Patel**, Erasmus Mundus Joint Master's Degree in Sustainable Ship and Shipping (SEAS 4.0), a.y. 2022–2023.
  A statistical approach for monitoring hull performance and forecasting ship's CO_2 emissions.

THESIS CO-SUPERVISOR (CO-RELATORE)

University of Naples Federico II

- **Vincenzo Napolitano**, MSc in Mechanical Engineering for Design and Production, a.y. 2021–2022.
  Adaptive multivariate functional EWMA control chart for resistance spot welding profiles.

- **Davide Forcina**, MSc in Mechanical Engineering for Design and Production, a.y. 2021–2022.
  Functional mixture regression control chart for resistance spot welding profiles.
  (In collaboration with Centro Ricerche Fiat, Turin)

- **Greta Barbato**, MSc in Engineering Management, a.y. 2020–2021.
  Functional control charts for the real-time reporting of Ro-Pax ship CO_2 emissions.

- **Mario Coppola**, MSc in Engineering Management, a.y. 2020–2021.
  Functional Data Approach for the Statistical Process Monitoring of Rail Propulsion Cooling Systems.

- **Gianluca Napoli**, MSc in Engineering Management, a.y. 2020–2021.
  Functional clustering of spot welding dynamic resistance curves in the automotive industry.

- **Arianna Di Lella**, MSc in Engineering Management, a.y. 2019–2020.
  Functional control charts for the monitoring, reporting and verification of Ro-Pax ship CO_2 emissions.

- **Roberto Precchia**, MSc in Aerospace Engineering, a.y. 2018–2019.
  Bootstrap control charts for composition of multiple-stream data from rail vehicle systems.

- **Ersilia Cozzolino**, MSc in Mechanical Engineering for Design and Production, a.y. 2018–2019.
  A bootstrapping approach to monitor extreme values of multiple data streams from modern rail vehicle systems.

- **Simone Pennino**, MSc in Engineering Management, a.y. 2018–2019.
  Statistical monitoring of ship operating conditions using dynamic time warping of unsynchronized functional data.

- **Gaetano D'Amelio**, MSc in Engineering Management, a.y. 2018–2019.
  Scalar-on-function regression adjustment for the monitoring of ship operating conditions and fuel consumption.

- **Orsola Spiezia**, MSc in Engineering Management, a.y. 2017–2018.
  A statistical approach for the monitoring of a complex system for modern trains heating, ventilation and air conditioning system application.

- **Francesca D'Ambrosio**, MSc in Engineering Management, a.y. 2017–2018.
  Data exploration and performance control of a complex system for modern rail vehicles: heating, ventilation and air conditioning application.

- **Fabio Centofanti**, MSc in Engineering Management, a.y. 2016–2017.
  A Functional Data Analysis Approach to Real-Time Monitoring of Ship Operational Conditions and Prediction of CO_2 Emissions.

University of Padova

- **Enrico Ceccolini**, MSc in Statistical Sciences.
  Applicazione di carte di controllo e modelli funzionali per la sorveglianza statistica del processo di saldatura su telai automobilistici.

ORGANIZATION OF EVENTS

Organising committee:

- CLADAG 2025 Local Organising Committee, *15-th Scientific Meeting Classification and Data Analysis Group*, University of Naples Federico II, Italy, 8-10 September 2025, Naples, Italy.

- International Symposium on Statistical Process Monitoring (ISSPM) 2025 Local Organising Committee, *International Symposium on Statistical Process Monitoring (ISSPM) 2025*, University of Naples Federico II, Italy, 7-11 July 2025, Naples, Italy.

- International Society for Business and Industrial Statistics (ISBIS) 2022 Local Organising Committee, *International Society for Business and Industrial Statistics (ISBIS) CONFERENCE 2022 on "Statistics and Data Science in Business and Industry"*, University of Naples Federico II, Naples, Italy, 20-21 June 2022, ISBN: 979-12-210-1389-4.

- ENBIS-21 Online Organizing Committee, *Online Conference of the European Network for Business and Industrial Statistics (ENBIS)*, 13–15 September 2021, ISBN: 979-12-20093-98-9.

- ENBIS-17 Organizing Committee, *17th Annual Conference of the European Network for Business and Industrial Statistics (ENBIS)*, Naples, Italy, 9–14 September, ISBN: 9789612403225

Organization of conference sessions:

- Young Statisticians Inviting Session, *Proceedings of the 23rd Annual Conference of the European Network for Business and Industrial Statistics (ENBIS)*, Valencia, Spain, 10–14 September, ISBN: 978-84-125444-9-7

- "Statistical Process Monitoring for Complex Data in Industry 4.0" Session promoted by Young-SIS. *Conference of the Italian Statistical Society SIS 2023*, Ancona, Italy, 21–23 June, ISBN: 9788891935618AAVV

- Software Session, *Proceedings of the 22nd Annual Conference of the European Network for Business and Industrial Statistics (ENBIS)*, Trondheim, Norway, 26–30 June 2022, ISBN: 978-82-303-5470-4

- Young Statisticians Inviting Session, *Proceedings of the 22nd Annual Conference of the European Network for Business and Industrial Statistics (ENBIS)*, Trondheim, Norway, 26–30 June 2022, ISBN: 978-82-303-5470-4

- Software Session, *Online Conference of the European Network for Business and Industrial Statistics (ENBIS)*, 13–15 September 2021, ISBN: 979-12-20093-98-9

PARTICIPATION TO ORGANIZATIONS

- Member of ENBIS (European Network for Business and Industrial Statistics), 2017-today.

- Commuincation Officer of the European Network for Business and Industrial Statistics (ENBIS), 2023-today.

- Leader of the Young Statisticians Special Interest Group (SIG) of ENBIS, 2022-2023.

- Member of the QSR (Quality, Statistics and Reliability) section of INFORMS, 2022-today.

- ENBIS-QSR Liaison: Appointed liaison between ENBIS and the INFORMS Quality, Statistics and Reliability (QSR) Section, coordinating the activities under the 5-year MoU signed in 2024 (Como). Responsible for promoting joint initiatives, cross-participation in conferences, webinars, and activities for young researchers, 2024-today.

- Member of SIS (the Italian Statistical Society), 2016-today.

- Member of the board of Young-SIS, the Italian group of SIS, the Italian Statistical Society, 2020-2021, also secretary only during 2021.

- Member of Young-SIS, the Italian group of SIS, the Italian Statistical Society, 2018-2022.

- Member of the board of Young Statisticians Europe and YoungStatS, 2020-2021.