

## List of Publications

- P1.** M. Tezzele, N. Demo, G. Stabile, A. Mola, and G. Rozza. Enhancing CFD predictions in shape design problems by model and parameter space reduction. *Advanced Modeling and Simulation in Engineering Sciences*, 7(40), 2020
- P2.** F. Romor, M. Tezzele, and G. Rozza. ATHENA: Advanced Techniques for High dimensional parameter spaces to Enhance Numerical Analysis. *Submitted*, 2020
- P3.** F. Romor, M. Tezzele, A. Lario, and G. Rozza. Kernel-based Active Subspaces with application to CFD parametric problems using Discontinuous Galerkin method. *arXiv preprint arXiv:2008.12083*, Submitted, 2020
- P4.** M. Gadalla, M. Cianferra, M. Tezzele, G. Stabile, A. Mola, and G. Rozza. On the comparison of LES data-driven reduced order approaches for hydroacoustic analysis. *arXiv preprint arXiv:2006.14428*, Submitted, 2020
- P5.** N. Demo, M. Tezzele, and G. Rozza. A supervised learning approach involving active subspaces for an efficient genetic algorithm in high-dimensional optimization problems. *arXiv preprint arXiv:2006.07282*, Submitted, 2020
- P6.** G. Rozza, M. W. Hess, G. Stabile, M. Tezzele, and F. Ballarin. Basic Ideas and Tools for Projection-Based Model Reduction of Parametric Partial Differential Equations. In P. Benner, S. Griwet-Talocia, A. Quarteroni, G. Rozza, W. H. A. Schilders, and L. M. Silveira, editors, *Handbook on Model Order Reduction*, volume 2, chapter 1. De Gruyter, In Press, 2020
- P7.** M. Tezzele, N. Demo, A. Mola, and G. Rozza. An integrated data-driven computational pipeline with model order reduction for industrial and applied mathematics. *Special Volume ECMI, In Press*, 2020
- P8.** N. Demo, M. Tezzele, and G. Rozza. A non-intrusive approach for reconstruction of POD modal coefficients through active subspaces. *Comptes Rendus Mécanique de l'Académie des Sciences, DataBEST 2019 Special Issue*, 347(11):873–881, November 2019
- P9.** M. Tezzele, N. Demo, and G. Rozza. Shape optimization through proper orthogonal decomposition with interpolation and dynamic mode decomposition enhanced by active subspaces. In R. Bensow and J. Ringsberg, editors, *Proceedings of MARINE 2019: VIII International Conference on Computational Methods in Marine Engineering*, pages 122–133, 2019
- P10.** N. Demo, M. Tezzele, A. Mola, and G. Rozza. A complete data-driven framework for the efficient solution of parametric shape design and optimisation in naval engineering problems. In R. Bensow and J. Ringsberg, editors, *Proceedings of MARINE 2019: VIII International Conference on Computational Methods in Marine Engineering*, pages 111–121, 2019
- P11.** A. Mola, M. Tezzele, M. Gadalla, F. Valdenazzi, D. Grassi, R. Padovan, and G. Rozza. Efficient reduction in shape parameter space dimension for ship propeller blade design. In R. Bensow and J. Ringsberg, editors, *Proceedings of MARINE 2019: VIII International Conference on Computational Methods in Marine Engineering*, pages 201–212, 2019
- P12.** M. Gadalla, M. Tezzele, A. Mola, and G. Rozza. BladeX: Python Blade Morphing. *The Journal of Open Source Software*, 4(34):1203, 2019
- P13.** N. Demo, M. Tezzele, G. Gustin, G. Lavini, and G. Rozza. Shape optimization by means of proper orthogonal decomposition and dynamic mode decomposition. In *Technology and Science for the Ships of the Future: Proceedings of NAV 2018: 19th International Conference on Ship & Maritime Research*, pages 212–219. IOS Press, 2018
- P14.** M. Tezzele, F. Salmoiraghi, A. Mola, and G. Rozza. Dimension reduction in heterogeneous parametric spaces with application to naval engineering shape design problems. *Advanced Modeling and Simulation in Engineering Sciences*, 5(1):25, Sep 2018

- P15.** M. Tezzele, N. Demo, M. Gadalla, A. Mola, and G. Rozza. Model order reduction by means of active subspaces and dynamic mode decomposition for parametric hull shape design hydrodynamics. In *Technology and Science for the Ships of the Future: Proceedings of NAV 2018: 19th International Conference on Ship & Maritime Research*, pages 569–576. IOS Press, 2018
- P16.** M. Tezzele, F. Ballarin, and G. Rozza. Combined parameter and model reduction of cardiovascular problems by means of active subspaces and POD-Galerkin methods. In D. Boffi, L. F. Pavarino, G. Rozza, S. Scacchi, and C. Vergara, editors, *Mathematical and Numerical Modeling of the Cardiovascular System and Applications*, volume 16 of *SEMA-SIMAI Series*, pages 185–207. Springer International Publishing, 2018
- P17.** N. Demo, M. Tezzele, A. Mola, and G. Rozza. An efficient shape parametrisation by free-form deformation enhanced by active subspace for hull hydrodynamic ship design problems in open source environment. In *Proceedings of ISOPE 2018: The 28th International Ocean and Polar Engineering Conference*, volume 3, pages 565–572, 2018
- P18.** N. Demo, M. Tezzele, and G. Rozza. PyDMD: Python Dynamic Mode Decomposition. *The Journal of Open Source Software*, 3(22):530, 2018
- P19.** N. Demo, M. Tezzele, and G. Rozza. EZyRB: Easy Reduced Basis method. *The Journal of Open Source Software*, 3(24):661, 2018
- P20.** F. Garotta, N. Demo, M. Tezzele, M. Carraturo, A. Reali, and G. Rozza. Reduced Order Isogeometric Analysis Approach for PDEs in Parametrized Domains. *QUIET special volume, Lecture Notes in Computational Science and Engineering series, Springer, Milano*, 2020, in press
- P21.** G. Rozza, M. H. Malik, N. Demo, M. Tezzele, M. Girfoglio, G. Stabile, and A. Mola. Advances in Reduced Order Methods for Parametric Industrial Problems in Computational Fluid Dynamics. In R. Owen, R. de Borst, J. Reese, and P. Chris, editors, *ECCOMAS ECFD 7 - Proceedings of 6th European Conference on Computational Mechanics (ECCM 6) and 7th European Conference on Computational Fluid Dynamics (ECFD 7)*, pages 59–76, Glasgow, UK, 2018
- P22.** F. Salmoiraghi, F. Ballarin, G. Corsi, A. Mola, M. Tezzele, and G. Rozza. Advances in geometrical parametrization and reduced order models and methods for computational fluid dynamics problems in applied sciences and engineering: Overview and perspectives. *ECCOMAS Congress 2016 - Proceedings of the 7th European Congress on Computational Methods in Applied Sciences and Engineering*, 1:1013–1031, 2016
- P23.** D. Cangelosi, A. Bonvicini, M. Nardo, A. Mola, A. Marchese, M. Tezzele, and G. Rozza. SRtP 2.0 — The Evolution of the Safe Return to Port Concept. In *Technology and Science for the Ships of the Future: Proceedings of NAV 2018: 19th International Conference on Ship & Maritime Research*, pages 665 – 672. IOS Press, 2018

## Conferences and Workshops

- C1.** ROMs in CFD (talks): Summer School on Reduced Order Methods in Computational Fluid Dynamics, 8–12 July 2019, SISSA, Trieste, Italy.
- C2.** MARINE 2019 (talk): VIII International Conference on Computational Methods in Marine Engineering, 13–15 May 2019, Gothenburg, Sweden.
- C3.** NAV 2018 (talk): 19th International Conference on Ship & Maritime Research, 20–22 June 2018, Trieste, Italy.
- C4.** MoRePaS 2018 (poster): Model Reduction of Parametrized Systems IV, 10–13 April 2018, Nantes, France.

- C5.** ADMOS 2017 (talk): International Conference on Adaptive Modeling and Simulations, 26–28 June 2017, Verbania, Italy.
- C6.** QUIET 2017 (poster): Quantification of Uncertainty: Improving Efficiency and Technology, 18–21 July 2017, Trieste, Italy.
- C7.** ME3 Conference at Institut Henri-Poincaré (poster): Recent developments in numerical methods for model reduction, 7–10 November 2016, Paris, France.
- C8.** Introductory school at IESC: Numerical methods for PDEs, 5–9 September 2016, Cargese, France.
- C9.** COST EU-MORNET (talk): Reduced Order Methods in Computational Fluid Dynamics: state of the art and perspectives, 22–23 February 2016, SISSA, Trieste, Italy.

## Awards and Funding

- A1.** Winner of DSWeb 2019 Software Contest (webpage) – Tutorials on Dynamical Systems Software - Junior Faculty Category - PyDMD Package, in collaboration with N. Demo. Announced at SIAM Conference on Applications of Dynamical Systems in Snowbird.
- A2.** 2018–2019 MISTI MIT-Italy FVG Project: Multi-disciplinary Ship Design by Reduced Order Models and Machine Learning at MIT and SISSA.
- A3.** Ph.D scholarship at SISSA, financed by Fincantieri S.p.A..
- A4.** Master in HPC scholarship at SISSA & ICTP, financed by Nvidia.
- A5.** SISSA: Master thesis fellowship for pre-graduate students (2014).

## Research Projects I Have Been Involved in

- R1. H2020 ERC CoG 2015 AROMA-CFD** project 681447 “Advanced Reduced Order Methods with Applications in Computational Fluid Dynamics” P.I. Gianluigi Rozza, supported by European Union Funding for Research and Innovation — Horizon 2020 Program — in the framework of European Research Council Executive Agency.
- R2. SOPHYA**, “Seakeeping Of Planing Hull Yachts”, supported by Regione FVG, POR-FESR 2014-2020, Piano Operativo Regionale Fondo Europeo per lo Sviluppo Regionale.
- R3. PRELICA**, “Advanced methodologies for hydro-acoustic design of naval propulsion”, supported by Regione FVG, POR-FESR 2014-2020, Piano Operativo Regionale Fondo Europeo per lo Sviluppo Regionale.
- R4. HEaD - Higher Education and Development**, “Shape optimization of bow and stern by mean of parametric algorithms and reduced order methods” in collaboration with Fincantieri S.p.A., supported by Regione FVG, European Social Fund FSE 2014-2020.
- R5. INdAM GNCS 2019:** “Advanced intrusive and non-intrusive model order reduction techniques and applications”.
- R6. INdAM GNCS 2018:** “Tecniche di riduzione di modello per le applicazioni mediche”.
- R7. TRIM-OPT**, Cluster Trasporti Italia 2020, main partner CNR-INSEAN.

## Software Libraries

- S1. PyDMD:** Python Dynamic Mode Decomposition. N. Demo, M. Tezzele, G. Rozza. (webpage | docs | DOI). Winner of DSWeb 2019 Software Contest.
- S2. PyGeM:** Python Geometrical Morphing. N. Demo, M. Tezzele, A. Mola, G. Rozza. (webpage | docs).
- S3. EZyRB:** Easy Reduced Basis method. N. Demo, M. Tezzele, G. Rozza. (webpage | docs | DOI).
- S4. BladeX:** Python Blade Morphing. M. Gadalla, M. Tezzele, A. Mola, G. Rozza. (webpage | docs | DOI).
- S5. ATHENA:** Advanced Techniques for High dimensional parameter spaces to Enhance Numerical Analysis. F. Romor, M. Tezzele, G. Rozza. (webpage | docs).

## Master Theses as co-advisor

- M1. E. Donadini.** Master Thesis, University of Trieste, Italy, 2020.
- M2. F. Romor.** Master Thesis: Reduction in Parameter Space for Problems approximated by Discontinuous-Galerkin Method in Computational Fluid Dynamics, University of Trieste, Italy, 2019.
- M3. A. Maurizio.** Master in HPC Thesis: Representation of distribution networks of ships using graph-theory, SISSA & ICTP, Trieste, Italy, 2018.
- M4. F. Garotta.** Master Thesis: Reduced Order Isogeometric Analysis approach for PDEs in parametrized domains, University of Pavia, Italy, 2018.