## Bibliography

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## References

- [1] D. Coscia, M. Welling, N. Demo, and G. Rozza, BARNN: A Bayesian Autoregressive and Recurrent Neural Network, 2025. arXiv: 2501.18665 [cs.LG]. [Online]. Available: https://openreview.net/forum?id=j24YaWZENk
- [2] G. Ortali, A. Gabbana, N. Demo, G. Rozza, and F. Toschi, "Kinetic data-driven approach to turbulence subgrid modeling," *Phys. Rev. Res.*, vol. 7, no. 3, p. 013 202, 1 Feb. 2025. DOI: 10.1103/PhysRevResearch.7.013202 arXiv: 2403.18466 [physics.flu-dyn]. [Online]. Available: https://link.aps.org/doi/10.1103/PhysRevResearch.7.013202
- [3] A. Pecile, N. Demo, M. Tezzele, G. Rozza, and D. Breda, "Data-driven Discovery of Delay Differential Equations with Discrete Delays," *Journal of Computational and Applied Mathematics*, vol. 461, p. 116439, 2025, ISSN: 0377-0427. DOI: https://doi.org/10.1016/j.cam.2024.116439 arXiv: 2407.19640 [math.NA]. [Online]. Available: https://www.sciencedirect.com/science/article/pii/S0377042724006873
- [4] D. Coscia, N. Demo, and G. Rozza, "Generative adversarial reduced order modelling," Scientific Reports, vol. 14, 2024. DOI: 10.1038/s41598-024-54067-z arXiv: 2305.15881 [cs.LG]. [Online]. Available: https://doi. org/10.1038/s41598-024-54067-z
- [5] S. Ichinaga et al., "Pydmd: A python package for robust dynamic mode decomposition," 2024. arXiv: 2402.07463 [stat.CO].
- [6] A. Ivagnes, N. Demo, and G. Rozza, "A shape optimization pipeline for marine propellers by means of reduced order modeling techniques," *International Journal for Numerical Methods in Engineering*, 2024. DOI: 10.1002/nme.7426 arXiv: 2305.07515 [math.OC].
- [7] D. Roznowicz, G. Stabile, N. Demo, D. Fransos, and G. Rozza, "Large-scale graph-machine-learning surrogate models for 3d-flowfield prediction in external aerodynamics," *Advanced Modeling and Simulation in Engineering Sciences*, 2024, ISSN: 2213-7467. DOI: https://doi.org/10.1186/s40323-024-00259-1 [Online]. Available: https://amses-journal.springeropen.com/articles/10.1186/s40323-024-00259-1

- [8] M. Teruzzi, N. Demo, and G. Rozza, "A graph-based framework for complex system simulating and diagnosis with automatic reconfiguration," Mathematics in Engineering, vol. 6, no. 1, pp. 28-44, 2024, ISSN: 2640-3501. DOI: 10.3934/mine.2024002 arXiv: 2302.06473 [eess.SY]. [Online]. Available: https://www.aimspress.com/article/doi/10.3934/mine.2024002
- [9] F. Andreuzzi, N. Demo, and G. Rozza, "A dynamic mode decomposition extension for the forecasting of parametric dynamical systems," *SIAM Journal on Applied Dynamical Systems*, vol. 22, no. 3, pp. 2432–2458, 2023. DOI: 10.1137/22M1481658 arXiv: 2110.09155 [math.NA].
- [10] D. Coscia, A. Ivagnes, N. Demo, and G. Rozza, "Physics-informed neural networks for advanced modeling," *Journal of Open Source Software*, 2023. DOI: 10.21105/joss.05352 [Online]. Available: https://doi.org/10.21105/joss.05352
- [11] D. Coscia, L. Meneghetti, N. Demo, G. Stabile, and G. Rozza, "A continuous convolutional trainable filter for modelling unstructured data," Computational Mechanics, 2023. DOI: 10.1007/s00466-023-02291-1 arXiv: 2210.13416 [cs.LG].
- [12] N. Demo, M. Strazzullo, and G. Rozza, "An extended physics informed neural network for preliminary analysis of parametric optimal control problems," Computers & Mathematics with Applications, vol. 143, pp. 383-396, 2023, ISSN: 0898-1221. DOI: 10.1016/j.camwa.2023.05.004 arXiv: 2110.13530 [cs.LG]. [Online]. Available: https://www.sciencedirect.com/science/article/pii/S0898122123002018
- [13] N. Demo, M. Tezzele, and G. Rozza, "A deeponet multi-fidelity approach for residual learning in reduced order modeling," *Advanced Modeling and Simulation in Engineering Sciences*, vol. 10, no. 1, p. 12, Jul. 2023. DOI: 10.1186/s40323-023-00249-9 arXiv: 2302.12682 [math.NA].
- [14] A. Ivagnes, N. Demo, and G. Rozza, "Towards a machine learning pipeline in reduced order modelling for inverse problems: Neural networks for boundary parametrization, dimensionality reduction and solution manifold approximation," *Journal of Scientific Computing*, vol. 95, no. 23, 2023. DOI: 10.1007/s10915-023-02142-4 arXiv: 2210.14764 [math.NA].
- [15] L. Meneghetti, N. Demo, and G. Rozza, "A dimensionality reduction approach for convolutional neural networks," *Applied Intelligence*, vol. 53, no. 19, pp. 22818–22833, Oct. 2023, ISSN: 1573-7497. DOI: 10.1007/s10489-023-04730-1 arXiv: 2110.09163 [cs.LG]. [Online]. Available: https://doi.org/10.1007/s10489-023-04730-1
- [16] N. Demo, M. Tezzele, G. Stabile, and G. Rozza, "Chapter 19: Scientific software development and packages for reduced order models in computational fluid dynamics," in Advanced Reduced Order Methods and Applications in Computational Fluid Dynamics. 2022, pp. 379–387. DOI: 10. 1137/1.9781611977257.ch19 [Online]. Available: https://epubs.siam.org/doi/abs/10.1137/1.9781611977257.ch19

- [17] L. Meneghetti, N. Demo, and G. Rozza, "A proper orthogonal decomposition approach for parameters reduction of single shot detector networks," in 2022 IEEE International Conference on Image Processing (ICIP), 2022, pp. 2206–2210. DOI: 10.1109/ICIP46576.2022.9897513 arXiv: 2210.13416 [cs.CV].
- [18] L. Meneghetti et al., "Chapter 20: A deep learning approach to improving reduced order models," in Advanced Reduced Order Methods and Applications in Computational Fluid Dynamics. 2022, pp. 389-413. DOI: 10. 1137/1.9781611977257.ch20 eprint: https://epubs.siam.org/doi/pdf/10.1137/1.9781611977257.ch20. [Online]. Available: https://epubs.siam.org/doi/abs/10.1137/1.9781611977257.ch20
- [19] A. Mola, N. Demo, M. Tezzele, and G. Rozza, "Chapter 17: Geometrical parametrization and morphing techniques with applications," in Advanced Reduced Order Methods and Applications in Computational Fluid Dynamics. 2022, pp. 345-364. DOI: 10.1137/1.9781611977257.ch17 [Online]. Available: https://epubs.siam.org/doi/abs/10.1137/1.9781611977257.ch17
- [20] G. Ortali, N. Demo, and G. Rozza, "Gaussian process approach within a data-driven POD framework for fluid dynamics engineering problems," *Mathematics in Engineering*, vol. 4, no. 3, pp. 1–16, 2022. DOI: 10.3934/mine.2022021 arXiv: 2012.01989 [math.NA].
- [21] D. Papapicco, N. Demo, M. Girfoglio, G. Stabile, and G. Rozza, "The neural network shifted-proper orthogonal decomposition: A machine learning approach for non-linear reduction of hyperbolic equations," Computer Methods in Applied Mechanics and Engineering, vol. 392, p. 114687, 2022, ISSN: 0045-7825. DOI: https://doi.org/10.1016/j.cma.2022. 114687 arXiv: 2108.06558 [math.NA]. [Online]. Available: https://www.sciencedirect.com/science/article/pii/S004578252200069X
- [22] M. Tezzele, N. Demo, A. Mola, and G. Rozza, "An integrated data-driven computational pipeline with model order reduction for industrial and applied mathematics," in Novel Mathematics Inspired by Industrial Challenges, M. Günther and W. S. Wil, Eds. Springer International Publishing, 2022, pp. 179–200, ISBN: 978-3-030-96173-2. DOI: 10.1007/978-3-030-96173-2\_7 arXiv: 1810.12364 [math.NA]. [Online]. Available: https://doi.org/10.1007/978-3-030-96173-2\_7
- [23] M. Tezzele, N. Demo, G. Stabile, and G. Rozza, "Chapter 9: Nonintrusive data-driven reduced order models in computational fluid dynamics," in Advanced Reduced Order Methods and Applications in Computational Fluid Dynamics. 2022, pp. 203-222. DOI: 10.1137/1.9781611977257.ch9 eprint: https://epubs.siam.org/doi/pdf/10.1137/1.9781611977257.ch9. [Online]. Available: https://epubs.siam.org/doi/abs/10.1137/1.9781611977257.ch9

- [24] N. Demo, M. Tezzele, A. Mola, and G. Rozza, "Hull shape design optimization with parameter space and model reductions, and self-learning mesh morphing," *Journal of Marine Science and Engineering*, vol. 9, no. 2, 2021, ISSN: 2077-1312. DOI: 10.3390/jmse9020185 arXiv: 2101.03781 [math.NA]. [Online]. Available: https://www.mdpi.com/2077-1312/9/2/185
- [25] N. Demo, M. Tezzele, and G. Rozza, "A supervised learning approach involving active subspaces for an efficient genetic algorithm in high-dimensional optimization problems," *SIAM Journal on Scientific Computing*, vol. 43, no. 3, B831–B853, 2021. DOI: 10.1137/20M1345219 arXiv: 2006.07282 [math.NA].
- [26] N. Demo, G. Ortali, G. Gustin, G. Rozza, and G. Lavini, "An efficient computational framework for naval shape design and optimization problems by means of data-driven reduced order modeling techniques," Bollettino dell'Unione Matematica Italiana, Nov. 2020, ISSN: 2198-2759. DOI: 10.1007/s40574-020-00263-4 arXiv: 2004.11201 [math.NA]. [Online]. Available: https://doi.org/10.1007/s40574-020-00263-4
- [27] F. Garotta, N. Demo, M. Tezzele, M. Carraturo, A. Reali, and G. Rozza, "Reduced order isogeometric analysis approach for PDEs in parametrized domains," in *Quantification of Uncertainty: Improving Efficiency and Technology: QUIET selected contributions*, M. D'Elia, M. Gunzburger, and G. Rozza, Eds. Springer International Publishing, 2020, pp. 153–170, ISBN: 978-3-030-48721-8. DOI: 10.1007/978-3-030-48721-8\_7 arXiv: 1811. 08631 [math.NA]. [Online]. Available: https://doi.org/10.1007/978-3-030-48721-8\_7
- [28] M. Tezzele, N. Demo, A. Mola, and G. Rozza, "PyGeM: Python geometrical morphing," Software Impacts, p. 100 047, 2020, ISSN: 2665-9638.
  DOI: https://doi.org/10.1016/j.simpa.2020.100047 [Online].
  Available: http://www.sciencedirect.com/science/article/pii/S2665963820300385
- [29] 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*, vol. 7, no. 1, p. 40, Oct. 2020, ISSN: 2213-7467. DOI: 10.1186/s40323-020-00177-y arXiv: 2001.05237 [math.NA]. [Online]. Available: https://doi.org/10.1186/s40323-020-00177-y
- [30] 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 VIII International Conference on Computational Methods in Marine Engineering, 2019. arXiv: 1905.05982 [math.NA].

- [31] N. Demo, M. Tezzele, and G. Rozza, "A non-intrusive approach for the reconstruction of POD modal coefficients through active subspaces," Comptes Rendus Mécanique, vol. 347, no. 11, pp. 873–881, Nov. 2019. DOI: 10. 1016/j.crme.2019.11.012 arXiv: 1907.12777 [math.NA]. [Online]. Available: https://doi.org/10.1016/j.crme.2019.11.012
- [32] M. Tezzele, N. Demo, and G. Rozza, "Shape optimization through proper orthogonal decomposition with interpolation and dynamic mode decomposition enhanced by active subspaces," in VIII International Conference on Computational Methods in Marine Engineering, 2019. arXiv: 1905.05483 [math.NA].
- [33] 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*, IOS Press, 2018, pp. 212–219. DOI: 10.3233/978-1-61499-870-9-212 arXiv: 1803.07368 [math.NA].
- [34] 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 *The 28th International Ocean and Polar Engineering Conference*, 2018. arXiv: 1801.06369 [math.NA].
- [35] N. Demo, M. Tezzele, and G. Rozza, "EZyRB: Easy reduced basis method," Journal of Open Source Software, vol. 3, no. 24, p. 661, Apr. 2018. DOI: 10.21105/joss.00661 [Online]. Available: https://doi.org/10.21105/joss.00661
- [36] N. Demo, M. Tezzele, and G. Rozza, "PyDMD: Python dynamic mode decomposition," *Journal of Open Source Software*, vol. 3, no. 22, p. 530, Feb. 2018. DOI: 10.21105/joss.00530 [Online]. Available: https://doi.org/10.21105/joss.00530
- [37] G. Rozza et al., "Advances in Reduced Order Methods for Parametric Industrial Problems in Computational Fluid Dynamics," in *Proceedings of the ECCOMAS Congress 2018*, ECCOMAS, Glasgow, UK: ECCOMAS, 2018. arXiv: 1811.08319 [math.NA].
- [38] 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*, IOS Press, 2018, pp. 569–576. DOI: 10.3233/978-1-61499-870-9-569 arXiv: 1803.07377 [math.NA].

[39] E. Calore, N. Demo, S. F. Schifano, and R. Tripiccione, "Experience on vectorizing lattice boltzmann kernels for multi- and many-core architectures," in *Parallel Processing and Applied Mathematics*. Springer International Publishing, 2016, pp. 53–62, ISBN: 978-3-319-32149-3. DOI: 10. 1007/978-3-319-32149-3\_6 [Online]. Available: https://doi.org/10. 1007/978-3-319-32149-3\_6