Lucas **Lestandi**

Associate Processor

about

Age 31

T123, 1 Rue de la Noë, 44000, Nantes

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languages

french, *native speaker*
english, *fluent*
spanish, *advanced*

programming

Fortran
Python (numpy)
Tensorflow/keras
VTK
CAD design
LaTeX
C++, MPI, openMP
bash, linux

research topics

surrogate modeling
NN for PDEs
tensor reduction
data decomposition
ROM, PODG
Additive Manufacturing
CFD (FV, FE, FD)

research interests

surrogate modeling, data driven models, deep learning for PDEs, data reduction, tensor decomposition, PINN, reduced order modeling, POD, tensor trains, projection ROM, interpolation ROM, additive manufacturing, complex flow simulation, bifurcations and instabilities,...

experience

2022-present **Maître de Conférences (Associate Professor)** Ecole Centrale Nantes, GeM
Teaching : Data bases, programming (C++, Python), ...
Research : Data driven models, Physics informed NN, ROM, geometric parametrization

2020-2021 **Scientist** EM, IHPC, A*Star, Singapore
Surrogate modeling for Additive Manufacturing
Marine & offshore structures
Data driven models, Physics informed NN, ROM, geometric parametrization

/2019-2020 **Research Fellow** SPMS, Nanyang Technological University, Singapore
Investigating Neural networks for PDEs
Tutorials in mathematics for engineering.

2015-2018 **Teacher Assistant** Université de Bordeaux, Bordeaux INP
Practical work (TP) at IUT Mesure physique
Travaux Dirigés Fluid Dynamics, MATMECA

03–06 2017 **Raman-Charpak fellow** IIT Kanpur Aerospace Eng. Dpt., India
Analysis of instability through POD at T.K. Sengupta HPC lab.

02–07 2015 **Research Intern** INRIA, Bordeaux
3D implementation of fluid dynamics code to compute trajectories of ice chunks formed on aircrafts. level-set, vortex-in-cell, IBM, etc.

06–08 2014 **Intern** Skymet Weather services Pvt. Ltd., New Delhi
Preliminary study and coding of fuzzy logics (data mining) for weather forecast.

education

2015-2018 **Ph.D.** in Mechanics I2M/TREFLE, Université de Bordeaux
"Reduced Order modeling applied to fluid dynamics.",
Supervisors: Mejdi Azaiez (U. Bordeaux), Tomás Chacón (U. Sevilla)
- *Tensor decomposition*
- *POD analysis of bifurcation sequence in LDC flow*
- *ROM, (a) "physical" interpolation , (b) POD Galerkin*

2014-2015 **M.Sc.** Université de Bordeaux
Applied mathematics (MIMSE)

2012-2015 **Masters degree in Engineering** ENSEIRB-MATMECA, Bordeaux
Mathematical modelling and mechanics,
Specialization in HPC for fluid dynamics simulation.

publications

L. Lestandi, J.C. Wong, G.Y. Dong, S. J. Kuehsamy, J. Mikula, G. Vastola, U. Kizhakkinan, C.S. Ford, D.W. Rosen, M.H. Dao, M.H. Jhon, *Data-driven surrogate modelling of residual stresses in Laser Powder-Bed Fusion*, Int. J. of Computer Integrated Manufacturing, 2023

Chetry, M., Borzacchiello, D., **Lestandi, L.**, Rocha Da Silva, L. (2023). *An iterative multi-fidelity approach for model order reduction of multi-dimensional input parametric PDE systems.*, Int. J. for Numerical Methods in Engineering

Wong, J. C., Ooi, C. C., Chattoraj, J., **Lestandi, L.**, Dong, G., Kizhakkinan, U.,..., Dao, M. H. (2022, December). Graph Neural Network Based Surrogate Model of Physics Simulations for Geometry Design. In 2022 IEEE Symposium Series on Computational Intelligence (SSCI) (pp. 1469-1475). IEEE.

Dong, G., Wong, J. C., **Lestandi, L.**, Mikula, J., Vastola, G., Jhon, M. H., Dao, M. H., Kizhakkinan, U., Ford, C. S., & Rosen, D. W. *A part-scale, feature-based surrogate model for residual stresses in the laser powder bed fusion process.* JMPT, 304. 2022.

L. Lestandi, *Numerical Study of Low Rank Approximation Methods for Mechanics Data and Its Analysis*, J. Sci. Comput., vol. 87, no. 1, p. 14, Apr. 2021.

M. Azaïez, **L. Lestandi**, T. Chacón Rebollo *Low Rank Approximation of Multidimensional Data*. In: S. Pirozzoli ,T. Sengupta (eds) High-Performance Computing of Big Data for Turbulence and Combustion. CISM International Centre for Mechanical Sciences (Courses and Lectures), vol 592. Springer, Cham, 2019

L. Lestandi, *Low rank approximation techniques and reduced order modeling applied to some fluid dynamics problems*,Thesis, Université de Bordeaux, 2018.

T. K. Sengupta , **L. Lestandi** , S. I. Haider, A. Gullapalli, and M. Azaïez, *"Reduced order model of flows by time-scaling interpolation of DNS data"*, AMSES, DOI : 10.1186/s40323-018-0119-2, 2018

L. Lestandi, S. Bhaumik, T.K. Sengupta, G.R.K.C. Avatar M. Azaiez, *"POD applied to numerical study of unsteady flow inside lid-driven cavity"* J. M. S., Vol. 51, No. 2, pp. 150-176, 2018.

L. Lestandi, S. Bhaumik, G. R. K. C. Avatar, M. Azaiez, and T. K. Sengupta, *"Multiple Hopf bifurcations and flow dynamics inside a 2D singular lid driven cavity,"* Computer & Fluids, vol. 166, pp. 86–103, 2018.

international conferences

MMLDT-CSET 2021, *Data Driven Surrogate Modelling of Part-Scale LPBF Process Simulation Using Parameterized Geometry*, **L. Lestandi**, M. H. John, J.C. Wong, M.H. Dao, Sept 2021

IMACS World Congress 2016, *Tensor Reduction for Reduced Order Modelling*, **L. Lestandi**, M. Azaïez, F. Ben Belgacem and T. Chacon, Xiamen, December 14, 2016

MORTech 2017, *A Time-scaled Interpolation Reduced Order Model*, **L. Lestandi**, M. Azaïez and T.K. Sengupta, Sevilla, November 10, 2017

teaching

Ecole Centrale de Nantes

Data visualization, BBA Big Data & Management, 24h, lead teacher, centrale Casablance, 2023
Databases (Fasttrack, BBA Big Data & Management) 60h/year, lead teacher, since 2022
Advanced python Engg. curriculum, 32h/year, lead teacher, since 2022
Algorithmics and C++ programming, Engg. curriculum, 34h Since 2022

Nanyang Technological University

2019-2020 Mathematics, Analysis Tutorials (32h)

Université de Bordeaux

2017-2018 Fluid dynamics tutorials: Bordeaux INP, Mécanique des fluides, (64h)
2016-2017 Labs thermodynamics : IUT Mesure Physique, Machines thermiques, (36h)
2016-2017 Labs fluid dynamics : IUT Mesure Physique, Mécanique des fluides, (24h)
2015-2016 Labs thermodynamics : IUT Mesure Physique, Machines thermiques, (28h)
2015-2016 Labs thermodynamics : IUT Mesure Physique, Thermiques, (20h)
2015-2016 Labs fluid dynamics : IUT Mesure Physique, Mécanique des fluides, (24h)

interests

Sports
football *(competitive)*, golf *(competitive)*, hiking, surf, etc.
General
food, science, travel, cultural exchange, etc.