

EDUCATION AND EXPERIENCE

Tecnologo

I am employed as Technologist within the SISSA mathLab group, in the Mathematical Analysis, Modelling and Applications area.

SISSA, Trieste

2023 - current

Chief Technology Officer

I am co-founder and chief technology officer of the FAST Computing company

FAST Computing Srl, Trieste

2022 - current

Research Fellow

I was employed as researcher fellow (“Assegnista di ricerca”) within the SISSA mathLab group, in the Mathematical Analysis, Modelling and Applications area. My main research topics are: model order reduction, data-driven modeling, scientific computing, parallel programming, shape parameterization, shape optimization, machine learning, deep learning

SISSA, Trieste

2017 - 2023

Internship

During the MHPC thesis, I worked as HPC specialist to build an efficient pipeline for the naval bulb shape optimization, coupling an automated freeform deformation, a finite volume solver and the model reduction

Fincantieri, Trieste

2016

Master in HPC

thesis: ‘Increasing speedup of naval hull workflow optimization using Reduced Order Method’ with the supervision of Prof. L. Heltai

SISSA, Trieste

2015 - 2016

B. Sc. in Computer Science

thesis: ‘Parallelizzazione e vettorizzazione di un algoritmo Lattice Boltzmann mediante direttive di compilazione’ with the supervision of Prof. F. S. Schifano

University of Ferrara

2012 - 2015

Scientific diploma

Liceo Ariosto, Ferrara

2007 - 2012

PROJECTS

MARINAI

I worked as a machine learning specialist, developing quick surrogate models and integrating them into the propeller design workflow.

BJMI

I worked as an AI specialist, designing and implementing a neural network to identify geometric features.

ARGOS

I designed and implemented the ARGOS server architecture, and I designed applications within ARGOS.

AROMA

I developed methodologies for CFD using an approach data-based, implementing them inside an open source environment. I developed the web graphical interface ARGOS as frontend of the AROMA-CFD methodologies, so making them available directly on web-browser

UBE2

In this project, I dealt with the implementation of a web interface capable to perform, and visualize, real-time algorithms for the higher order spectral analysis

PhD4PMI

In this Proof of Concept, I collaborate with Wärtsilä in merit of application of machine learning and deep learning algorithm to estimate the fuel consumption for hybrid naval engine

MISTI

I collaborate with the Massachusetts Institute of Technology for an advanced optimization pipeline that includes reduced order modeling, shape parameterization, multi-fidelity models, gaussian process regression

SOPHYA

I have been involved in the POR-FESR SOPHYA project, which had the goal of increase the performances of planing hulls. In particular, I worked on the data-driven reduced order model and on the shape parameterization for an efficient shape optimization procedure

SAFE

I contributed within the POR-FESR SAFE project for the development of a digital twin of the ship, based on graph theory, for the dynamic quantification of damages occurred on-board.

HeAD

Within this project, I had the opportunity to collaborate with Fincantieri SpA for the development of an (open source) framework capable to exploit the reduced order modeling benefits for an industrial shape optimization problem

SOFTWARE

PyDMD

Python Dynamic Mode Decomposition

<https://mathlab.sissa.it/pydmd>

EZyRB

Easy Reduced Basis Method

<https://mathlab.sissa.it/ezyrb>

PyGeM

Python Geometrical Morphing

<https://mathlab.sissa.it/pygem>

ARGOS

Advanced Reduced order modellinG: Online computational web server for parametric Systems

<https://argos.sissa.it>

PINA

Physics-Informed Neural networks for Advanced modeling

<https://mathlab.github.io/PINA/>

CONFERENCE

SIAM MDS 2024

Presentation and Tutorial Session

Physics Informed Neural Networks for Advanced Modeling: PINA Library and Tutorials

Atlanta, October 2024

Eccomas Congress 2024

9th European Congress on Computational Methods in Applied Sciences and Engineering

PINA: a PyTorch Framework for Deep Differential Equation Learning for Research and Production Environments

Lisbona, June 2024

ICLR 2024

Poster Presentation at AI4DifferentialEquations workshop

PINA: a PyTorch Framework for Solving Differential Equations by Deep Learning for Research and Production Environments

Vienna, May 2024

Advanced School on Applied Machine Learning

Summer School on Applied ML at ICTP

Accelerating Numerical Simulations by means of Physics Informed Machine Learning

Trieste, May 2024

M2P2023

Eccomas Conference on Emerging Technologies in Computational Science for Industry, Sustainability and Innovation

ARGOS: The Computational Web Platform for Fast Simulation

Teormina, Messina, June 2023

CSE23

SIAM Conference on Computational Science and Engineering

Real-Time Modeling Through Neural Networks: Challenges and Perspectives

Amsterdam, February 2023

ESB2022

27th Congress of the European Society of Biomechanics

A Web platform for data-driven, real-time modeling and visualizing cardiovascular problems

Oporto, June 2022

SIMAI 2020+2021*Parma, September 2021*

Convegno nazionale della Società Italiana di Matematica Applicata e Industriale

A Computational Pipeline Exploiting Reduced Order Modeling Techniques For Industrial Shape Optimization Problems

MARINE 2021*Virtual (Edinburgh), June 2021*

IX International Conference on Computational Methods in Marine Engineering

Data-driven reduced order modeling for efficient solution of industrial shape optimization problems

CSE21*Virtual (Fort Worth), January 2021*

SIAM Conference on Computational Science and Engineering

Accelerating Shape Optimization Problems by Means of Model Order Reduction

WCCM ECCOMAS*Virtual (Paris), January 2021*

A Modular And Data-driven Framework Involving Reducing Order Methods For Naval Optimization Industrial Problems

DAEDALUS Winter School*Berlin, December 2019*

Machine Learning meets Numerical Analysis of PDE

ROM Summer School*Trieste, July 2019*

Reduced Order Methods in Computational Fluid Dynamics

MARINE*Goteborg, May 2019*

VII International Conference on Computational Methods in Marine Engineering

MOR Summer School*Hamburg, September 2018*

Model Order Reduction Summer School

NAV*Trieste, 2018*

19th International Conference on Ship & Maritime Research

PUBLICATIONS

The complete list of all publications is attached on a separate files.