



1st Workshop on Machine Learning for Fluid Dynamics PARIS-Sorbonne University

Location: CICSU (Sorbonne Université, Jussieu Campus, Centre International de Conférences de Sorbonne Université), Tower 44

Friday, 8 th March 2024	
08:50	Opening room: 1st Floor, Room 108
09:00	Emmanuel De Bézenac, ETH Zurich, Switzerland <i>"Representation Equivalent Neural Operators"</i> Room 108
	Room: 108
	Chair: P. Gallinari
	Room: 106
	Chair: M. Tsubokura
09:45	Direct Poisson Neural Networks Michal Pavelka Charles University, Czech Republic
	Physics of The Vortex-Boundary Layer Interaction Under an Optimal Lift Mitigation Strategy Brice Martin, Thierry Jardina, Emmanuel Rachelsona, Michael Bauerheim ISAE-SUPAERO, Toulouse, France
10:00	Neural Radiance Fields (NeRF) for Geometry Representation Jamil Appa, James Sharpe, Constantinos Vagianos, David Standingford Zenotech Ltd, UK
	Flow Optimization Using Deep Reinforcement Learning for Safety Preserving of Solar Panels Facing Wind Risks Théodore Michel, Philippe Meliga, Paolo Massarotti, Elie Hachem Mines Paris, PSL Research University, Centre de Mise en Forme des Matériaux (CEMEF), CNRS UMR 7635, Sophia Antipolis, France
10:15	Infinity: Neural Field Modeling for Reynolds-Averaged Navier-Stokes Equations Louis Serrano, Léon Migus, Yuan Yin, Jocelyn Ahmed Mazari, Patrick Gallinari Sorbonne Université, CNRS, ISIR, Paris, France
	Towards Data-driven ML Approaches for Road Vehicle Aerodynamics Neil Ashton, D. C. Maddix, P. Moreno, V. Ananthan, S. Subramanian Amazon Web Services
10:30	Influence of Adversarial Training On Super-Resolution Turbulence Reconstruction Ludovico Nista, Christoph D. K. Schumann, Temistocle Grenga, Jonathan F. MacArt, Antonio Attili, Heinz Pitsch Institute for Combustion Technology, RWTH Aachen University, Germany
	Toward Data-Driven Urban Canopy Models Rémi Alas, Michael Bauerheim, Thomas Jaravel, Corentin Lapeyre CERFACS, France
10:45	How Temporal Unrolling Supports Neural Physics Simulators Björn List, Li-Wei Chen, Kartik Bali, Nils Thuerey Technical University of Munich, Germany
	Parameterization of Atmospheric Surface Layer Using Random Forest Method Yixun Liu, Yidi Hou, Mofan Qiu, Chun-Ho Liu The University of Hong Kong
11:00	Coffee break: Room 102



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	Room: 108	Room: 106
	Chair: R. Dwight	Chair: L. Mathelin
11:30	<p>Vectorized Conditional Neural Fields for Computational Fluid Dynamics</p> <p>Jan Hagnberger, Marimuthu Kalimuthu, Mathias Niepert</p> <p>Machine Learning and Simulation Lab, Institute for Artificial Intelligence, University of Stuttgart, Germany</p>	<p>Deep Learning Assisted Study of Shock-Train Response in a Scramjet Isolator: Towards Inflow Perturbations</p> <p>Aakash Patil, Jagmohan Singh, Federico Rios Tascon, Venkat Raman, Peter Schmid, Beverley McKeon</p> <p>Stanford University, Center for Turbulence Research, USA</p>
11:45	<p>Optimal Variables for Complex Network Representations of Turbulent Velocity Gradient Dynamics</p> <p>Maurizio Carbone, Christopher J. Keylock</p> <p>Theoretical Physics I, University of Bayreuth, Germany</p>	<p>Multi-fidelity Bayesian Optimisation for the Control of Wind Turbines based on LES and Wake Models</p> <p>Andrew Mole, Sylvain Laizet</p> <p>Imperial College London, United Kingdom</p>
12:00	<p>Bregman Neural Operators for Predicting Fluid Dynamics</p> <p>Abdel-Rahim Mezidi, Rémi Emonet, Jordan Frecon, Amaury Habrard, Saverio Salzo, Marc Sebban</p> <p>Université Jean Monnet Saint-Etienne, CNRS, Institut d'Optique Graduate School, Inria, Laboratoire Hubert Curien UMR 5516, France</p>	<p>A Reduced-Order Modeling Framework for Atmospheric Boundary Layer Flows Modelling Combining Dimensionality Reduction and Bayesian Regression</p> <p>Haoyan Li, Leo Cotteleer, Alessandro Gambale, Alessandro Parente</p> <p>ATM Laboratory, Ecole polytechnique de Bruxelles, Université Libre de Bruxelles, Belgium; Brussels Institute for Thermal-fluid systems and clean Energy (BRITE), ULB and VUB, Belgium</p>
12:15	<p>Extending Deep Learning Emulation Across Parameter Regimes to Assess Stochastically Driven Spontaneous Transition Events</p> <p>Ira J. S. Shokar, P. H. Haynes, R. R. Kerswell</p> <p>Department of Applied Mathematics and Theoretical Physics, University of Cambridge, Cambridge, UK</p>	<p>Improvement of Coarse Grid Computational Fluid Dynamics Simulations Through Higher Order Singular Value Decomposition and Deep Learning</p> <p>Guillermo Barragán, A. Corrochano, R. Abadía-Heredia, J. Garicano-Mena, S. Le Clainche</p> <p>ETSI Aeronáutica y del Espacio, Universidad Politécnica de Madrid, Spain</p>
12:45	Closure	