Félix CHAVELLI

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EDUCATION

M.Sc. Computer Science (by Research)
2022 – Now

National University of Singapore — Singapore
- Neural Networks, Deep Learning, Data mining, NLP, Trustworthy Machine Learning
- Master Thesis: Data-Driven Discovery of State Variables from Dynamical System Observations

M.Sc. Applied Mathematics (French Grande École Engineering Degree)
2019 – 2022

ENSTA Paris, Institut Polytechnique de Paris — Paris, France
- Mathematics : Optimization, Statistics, Probabilities, PDEs, Graphs, Modelling, Operations Research
- Computing : Scientific Programming, Algorithmics, Signal Processing, Finite Elements, Databases
- Physics : Fluid Dynamics, Quantum and Statistical Physics, Continuum Mechanics, Elasticity

B.Sc. Applied Mathematics
2016 – 2019

Paul Sabatier University — Toulouse, France
- Mathematics: Calculus, Algebra, Topology, Probabilities, Statistics, Optimization, Differential Equations
- Numerical methods: ODEs & PDEs approximation, Stochastic Simulations, Signal and Image Processing

RESEARCH EXPERIENCE

Research Assistant
Sept 2022 – Now

CNRS@CREATE (French National Centre for Scientific Research) — Singapore
- Physics-informed neural network for dynamical systems analysis, supervised by prof. Stéphane Bressan
- Development of a model for the discovery of dynamical systems state variables from observational data
- Publication of a conference paper : *Assessing the Effectiveness of Intrinsic Dimension Estimators for Uncovering the Phase Space Dimensionality of Dynamical Systems from State Observations*, DEXA 2023
- Talks given at conferences & workshops: JSPS 2023, Tokyo; SINFRA 2023, Toulouse; DEXA 2023, Malaysia

Research Assistant
Sept 2021 – Feb 2022

IPCC (Intergovernmental Panel on Climate Change) — Paris Saclay, France
- Meta-analysis of the 6th IPCC assessment report, supervised by prof. Sarah Connors
- Analysis of the last report references covering their use, sources, diversity and representativeness
- Publication of a press article : *What 13,500 citations reveal about the IPCC's climate science report* in Carbon Brief

Visiting Scholar
May 2021 – July 2021

Harvard University, School of Engineering and Applied Sciences — Cambridge, MA, USA
- Physics-informed neural networks for fluid mechanics, supervised by prof. David Sondak and prof. Pavlos Protopapas
- Solving Reynolds-Averaged Navier-Stokes equations for a turbulent channel flow from Direct numerical simulation

Research Intern
June 2019

IRIT (Computer Science Research Institute of Toulouse) and ISAE Supaéro — Toulouse, France
- Machine learning for preventive maintenance of aircraft engines, supervised by prof. Thomas Pellegrini
- Classification of engine anomalies from audio recordings of degraded configurations using neural networks

Research Intern
August 2018

Meteo France, Forecasting Operations Department — Toulouse, France
- Statistical modeling applied to visibility and fog phenomena, supervised by prof. Olivier Mestre
- Developing a fog forecasting model from AROME and ARPEGE (French and European meteorological models)

PROJECTS

Autonomous Rescue Robot (Sept - May 2021): development of an autonomous land-based robot for emergency humanitarian aid to accident victims in uncertain environment for the European ERL Emergency competition

City-wide Carbon Accounting Tool (Sept - Dec 2020): creation of a carbon accounting tool for tracking emissions and providing decision support on an urban scale for the IP Paris Carbon Neutral City (selected project)

ideal-de-france (May - Aug 2021): development of a resource platform for the ecological and energetic transition in an international context (Gold medal recipient of the Ile-de-France Student Ambassador Trophy)

SKILLS AND ASSOCIATIVE EXPERIENCES

Languages: French (native), English (advanced), Spanish (intermediate)

Programming: Python (PyTorch, TensorFlow, Keras, sk-learn), C/C++, R, MATLAB, Julia, SQL

Summer School: CNES Orbital Systems program: lectures, thematic studies, aerospace engineering, industrial visits

Teaching and supervision: science teacher: tutoring and competitive exam preparation for secondary and higher education, freestyle rollerskating judge and trainer, international summer camp animator, lifeguard

Volunteering: *Climate Fresk*: animation of workshops to raise awareness about climate change; *Utopia56*: emergency assistance for refugees; *Cop'1*: food distributions, study on precariousness, creation of the Cop'1 website; *UPSILON Junior Enterprise*: prospecting and mission follow-up; *Le Catalyseur*: (pre-incubator) organization of events and writing of articles

Sports and hobbies: climbing, alpine skiing and ski touring, swimming, freestyle roller skating, piano