

Recently graduated with a Ph.D., I specialize in the fusion of econometrics and machine learning, particularly in time series forecasting. My research area encompasses time series analysis, signal processing, and sequential learning, in which I bring a robust understanding of both theoretical concepts and practical applications. I am also a team player with a proven track record of collaborating with cross-functional teams to achieve business goals.

EDUCATION	UNIVERSITY OF ORLÉANS <i>Ph.D.¹, Computer Science and Signal Processing</i>	ORLÉANS, FRANCE 10/2019 – 09/2023
	<ul style="list-style-type: none">• Dissertation: <i>Time Series Forecasting: From Econometrics to Deep Learning</i>• Supervisors: Prof. Philippe Ravier, Assoc. Prof. Meryem Jabloun	
	UNIVERSITY OF ORLÉANS <i>Diplôme d'Ingénieur², Computer Engineering, Polytech Orléans</i> <i>M.Sc., Computer Science</i>	ORLÉANS, FRANCE 09/2015 – 09/2018 09/2017 – 09/2018
	<ul style="list-style-type: none">• Dissertation: <i>A Fundamental Study on Deep Learning based Time Series Forecasting</i>• Supervisors: Prof. Christel Vrain, Prof. Marcilio C. P. de Souto, Assoc. Prof. Sylvie Treuillet	
	BEIJING INSTITUTE OF TECHNOLOGY <i>B.Eng., Electrical & Electronics Engineering</i>	BEIJING, CHINA 09/2012 – 06/2016
	<ul style="list-style-type: none">• Dissertation: <i>A Microphone Array-based System for Sound Source Localization</i>• Supervisors: Assoc. Prof. Shiyong Li, Assoc. Prof. Rodolphe Weber	
PROFESSIONAL EXPERIENCE	UNIVERSITY OF ORLÉANS <i>Lecturer, Teaching for Engineering Program at Polytech Orléans</i>	ORLÉANS, FRANCE 01/2023 – 09/2023
	<ul style="list-style-type: none">• Introduction to Signal Processing. Signal and Linear Systems. Acquisition Systems. MATLAB.• Arduino & Embedded Systems.	
	ATTILA GESTION <i>Data Scientist</i>	LYON, FRANCE 04/2018 – 12/2022
	<ul style="list-style-type: none">• ATILA is a building industry franchise, partnering with major industry groups. It has a large amount of time series data, e.g., the number of customers, revenue, and service types.• ATILA wants to segment its customer groups by size and field for tailored resource allocation. It also requires a forecasting tool for key indicators to support business decisions.• Employed clustering for customer segmentation and econometric/deep learning for forecasting sales and revenue. Provided multiple forecasting models for internal tools.• Investigated the decomposition-ensemble strategy on forecasting methods, implemented a deep learning evaluation framework under various strategies, and assessed them on diverse datasets.• Developed an automated forecasting tool that selects the optimal forecasting strategy and model:<ul style="list-style-type: none">– For short series (<100 points), traditional methods like ARIMA and Theta are chosen, along with <i>ensemble learning</i> strategies.– For medium-length series (100 to 500 points), hybrid methods like ES-RNN and Prophet are selected, incorporating the <i>decomposition-ensemble</i> strategy.– For long series of (>500 points), deep learning methods like Transformer are applied.• Created a user-friendly and accessible forecasting tool based on libraries e.g., Flask, Plotly, and sktime, delivered as a Web APP in Docker. Users without knowledge of time-series techniques can upload an Excel file in the correct format, and this tool will complete the predictive analysis, presenting the forecast results in graphical form to support business decisions.	
	ECONTENT STORE SÀRL <i>Software Development Intern</i>	LUXEMBOURG 06/2017 – 08/2017
	<ul style="list-style-type: none">• Acted as one of the core developers of the Android development team for an AR product.• Implemented key enhancements and upgrades for AR functionalities, encompassing improved technique selection, natural feature training pipeline, and numerous bug fixes.• Developed a WebGL tool for natural features training to improve rendering performance.• Wrote design and related interface documentation, and user manuals for the WebGL tool.	

SELECTED PROJECTS	STLFORMER: FORECASTING WITH STL DECOMPOSITION AND RANK CORRELATION 03/2023 <ul style="list-style-type: none"> Proposed STLformer, a Transformer-based time series forecasting model. Progressively decomposes the series with STL and models seasonal and long-term trend patterns with the encoder and decoder, respectively. Tests the ARCH effect and uses Spearman's ρ-based attention to model nonlinear dependencies. Achieves forecasting in $\mathcal{O}(N \log N)$ and outperforms SOTA methods on multiple datasets, especially on nonlinearly dependent series (e.g., financial series).
	ON DEEP LEARNING-BASED TIME SERIES FORECASTING STRATEGIES 07/2022 <ul style="list-style-type: none"> Assessed various forecasting strategies, i.e., one-step recursive, direct, MIMO, and MISMO. Evaluated multiple deep learning models on diverse datasets and different strategies. Discussed the pros and cons of different models and strategies and provided recommendations for different application scenarios, w.r.t. series length, granularity, seasonality, and stationarity.
	ON THE DECOMPOSITION-ENSEMBLE STRATEGY ON TSF ALGORITHMS 07/2021 <ul style="list-style-type: none"> Assessed various decomposition methods, i.e., Classical, STL, and Prophet. Implemented econometric and ML models under the decomposition-ensemble strategy. Evaluated the performance of different models on the M-Competition dataset. This strategy can benefit traditional models, but its impact on ML models depends on the data distribution.
	DECORATIONS SEGMENTATION FROM CERAMIC SHARDS WITH DEEP LEARNING 02/2018 <ul style="list-style-type: none"> Built 2D FCNs to segment decorated regions on ancient ceramic shards. Benchmarked the segmentation results against other algorithms, e.g., K-means and DBSCAN.
	PLANT ECGs CLASSIFICATION WITH CNN AND SVM 11/2017 <ul style="list-style-type: none"> Sampled 400 plant ECG signals using BitScope and plant ECG sensor. Classified the signals with 1D-CNN and SVM, where SVM uses four core extracted features. Achieved 87% accuracy with 1D-CNN and 98% accuracy with SVM.
SELECTED PUBLICATIONS	<ol style="list-style-type: none"> Z. Ouyang, M. Jabloun, and P. Ravier, "Leveraging Rank Correlation and STL Decomposition for Transformer-based Time Series Forecasting," <i>Eng. Appl. Artif. Intell. (EAAI)</i>, 2023, (SCIE Q1, IF=8, in prep.) Z. Ouyang, M. Jabloun, and P. Ravier, "A Contemporary and Comprehensive Survey on Time Series Forecasting," <i>IEEE Trans. Knowl. Data Eng. (TKDE)</i>, 2023, (SCIE Q1, IF=8.9, in prep.) Z. Ouyang, M. Jabloun, and P. Ravier, "STLformer: Exploit STL decomposition and Rank Correlation for Time Series Forecasting," in <i>Proc. EUSIPCO</i>, 2023. Z. Ouyang, M. Jabloun, and P. Ravier, "Rankformer: Leverage Rank Correlation for Transformer-based Time Series Forecasting," in <i>Proc. IEEE SSP</i>, 2023. G. Ouyang, K. Abed-Meraim, and Z. Ouyang, "Magnetic-Field-Based Indoor Positioning Using Temporal Convolutional Networks," <i>Sensors</i>, vol. 23, no. 3, p. 1514, 2023, (SCIE Q1, IF=3.9). Z. Ouyang, P. Ravier, and M. Jabloun, "Are Deep Learning Models Practically Good as Promised? A Strategic Comparison of Deep Learning Models for Time Series Forecasting," in <i>Proc. EUSIPCO</i>, 2022. Z. Ouyang, P. Ravier, and M. Jabloun, "STL Decomposition of Time Series Can Benefit Forecasting Done by Statistical Methods but Not by Machine Learning Ones," <i>Eng. Proc.</i>, vol. 5, no. 1, p. 42, 2021.
SKILLS	Programming: Python, R, MATLAB, C#, Java, C/C++, SQL, \LaTeX Frameworks & Tools: PyTorch, scikit-learn, Unity3D, OpenCV, PowerBI, Linux, Git Expertise: Machine/Deep Learning, Time Series Analysis, Econometrics, Causal Inference, Signal Processing, Nonlinear Optimization Languages: English (proficient), French (proficient), Mandarin (native)
AWARDS	<ul style="list-style-type: none"> Erasmus+ Consortium Polytech, Polytech Orléans 2017 College Student Academic Scholarship, Beijing Institute of Technology 2012 – 2015 National 3rd Prize, Chinese Exhibition of Calligraphy and Painting for Undergraduates 2013
OTHER EXPERIENCE	<ul style="list-style-type: none"> Volunteer, Chinese New Year Festivity, <i>Orléans and Yangzhou Government</i> Feb. 2017 Vice President, <i>Association of Calligraphy of Beijing Institute of Technology</i> 2013 – 2015
HOBBIES	Basketball, Reading, Chinese Calligraphy, Singing, Fitness, and Cooking.

¹Industrial Ph.D. program contracted with ATILA Gestion.

²"Diplôme d'Ingénieur" is a highly accredited elite diploma in France, equivalent to M.Eng. Only the top 10% of the students in the French Baccalaureate can apply for this education program in engineering schools. Students delve deep into engineering and science courses and receive management, economics, and social sciences education, ensuring they emerge as well-rounded professionals.