

# Zuokun OUYANG Ph.D.

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 zuokun-ouyang

Recently graduated with a Ph.D., I specialize in the fusion of econometrics and machine learning, particularly in the field of time series forecasting. My research encompasses time series analysis, econometric-machine learning integration, and sequential/temporal learning.

**EDUCATION**      **UNIVERSITY OF ORLÉANS**      Orléans, France  
**Ph.D., Computer Science and Signal Processing**      Oct. 2019 – July 2023

- Dissertation: *Time Series Forecasting: From Econometrics to Deep Learning*
- Supervisors: Prof. Philippe Ravier, Assoc. Prof. Meryem Jabloun
- Funding: Association Nationale de la Recherche et de la Technologie CIFRE N° 2019/0551 contracted with ATTILA Gestion

**UNIVERSITY OF ORLÉANS**      Orléans, France  
**Diplôme d'Ingénieur, Computer Engineering, Polytech Orléans**      Sept. 2015 – June 2018  
**M.Sc., Computer Science**      Sept. 2017 – June 2018

- Dissertation: *A Fundamental Study on Deep Learning based Time Series Forecasting*
- Supervisors: Prof. Christel Vrain, Prof. Marcilio C. P. de Souto, Assoc. Prof. Sylvie Treuillet

**BEIJING INSTITUTE OF TECHNOLOGY**      Beijing, China  
**B.Eng., Electrical & Electronics Engineering**      Sept. 2012 – June 2016

- Dissertation: *A Microphone Array-based System for Sound Source Localization*
- Supervisors: Assoc. Prof. Shiyong Li, Assoc. Prof. Rodolphe Weber

**PROFESSIONAL EXPERIENCE**      **UNIVERSITY OF ORLÉANS**      Orléans, France  
**Temporary Research Assistant & Assistant Lecturer (ATER)**      Jan. 2023 – Present

- Signals and Linear Systems (*EPL3CI13*).
- Embedded Systems Projects (*EPL2CI03*).
- Introduction to Signal Processing (*EPL4CI04*).
- Mathematics and Computer Science Basics (*EPL2CI02*).
- Acquisition Systems and Signal Processing (*EPL2IA01*).

**ATTILA GESTION**      Lyon & Montargis, France  
**Machine Learning Engineer and Data Analyst**      Oct. 2019 – Dec. 2022

- Identified and assessed various internal metrics across multiple franchise agencies.
- Designed multi-step forecasting models for multivariate time series.
- Performed customer segmentation exploiting traditional and time series clustering techniques.
- Developed pipelines for assessing the effectiveness of various time series forecasting models.

**ATTILA GESTION**      Montargis, France  
**Data Analyst Intern**      Apr. 2018 – Sept. 2018

- Evaluated performance metrics of numerous franchise agencies.
- Performed a literature review on econometric and ML models for time series analysis.
- Investigated and assessed different econometric and ML models for time series forecasting.

**ECONTENT STORE SÀRL**      Luxembourg  
**Software Development Engineer Intern**      June 2017 – Aug. 2017

- Acted as one of the core developers of the Android development team.
- Implemented key enhancements and upgrades for AR functionalities, encompassing improved technique selection, natural feature training pipeline, and numerous bug fixes.
- Led the development of a user-end WebGL tool for natural features training to improve rendering performance.

SCIENTIFIC KNOWLEDGE	<p><b>Programming</b> Python, R, C#, Java, C/C++, Swift, MATLAB, SQL</p> <p><b>Frameworks &amp; Tools</b> PyTorch, scikit-learn, Unity3D, OpenCV, PowerBI, Linux, Git</p> <p><b>Skills &amp; Expertise</b> Deep Learning, Machine Learning, Time Series Analysis, Signal Processing, Optimization Theory, Non-linear Regression</p> <p><b>Languages</b> English (proficient), French (proficient), Mandarin (native)</p>
SELECTED PUBLICATIONS	<ol style="list-style-type: none"> <li>1. <b>Z. Ouyang</b>, M. Jabloun, and P. Ravier, "Leveraging Rank Correlation and STL Decomposition for Transformer-based Time Series Forecasting," <i>Expert Syst. Appl.</i>, in preparation, 2023.</li> <li>2. <b>Z. Ouyang</b>, M. Jabloun, and P. Ravier, "A Contemporary and Comprehensive Survey on Time Series Forecasting," <i>IEEE Trans. Knowl. Data Eng.</i>, in preparation, 2023.</li> <li>3. <b>Z. Ouyang</b>, M. Jabloun, and P. Ravier, "STLformer: Exploit STL decomposition and Rank Correlation for Time Series Forecasting," in <i>Proc. EUSIPCO</i>, 2023.</li> <li>4. <b>Z. Ouyang</b>, M. Jabloun, and P. Ravier, "Rankformer: Leverage Rank Correlation for Transformer-based Time Series Forecasting," in <i>Proc. IEEE SSP</i>, 2023.</li> <li>5. G. Ouyang, K. Abed-Meraim, and <b>Z. Ouyang</b>, "Magnetic-Field-Based Indoor Positioning Using Temporal Convolutional Networks," <i>Sensors</i>, vol. 23, no. 3, p. 1514, 2023.</li> <li>6. <b>Z. Ouyang</b>, 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.</li> <li>7. <b>Z. Ouyang</b>, P. Ravier, and M. Jabloun, "A Comparison Study of Deep Learning Models Combined with Multistep Time Series Forecasting Strategies," in <i>Proc. ITISE</i>, 2022, p. 2.</li> <li>8. <b>Z. Ouyang</b>, 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.</li> </ol>
SELECTED PROJECTS	<p><b>iOS application RestauRank</b> <span style="float: right;">Mar. 2018 – Apr. 2018</span></p> <ul style="list-style-type: none"> <li>• Developed a map App to locate top-rated local restaurants and determine the fastest route.</li> <li>• Google Maps SDK and Google Geolocation API for map visualization, navigation, and reviews.</li> </ul> <p><b>Archaeological ceramic decoration segmentation</b> <span style="float: right;">Jan. 2018 – Mar. 2018</span></p> <ul style="list-style-type: none"> <li>• Built 2D FCNs to segment decorated regions on ancient ceramic fragments using depth maps.</li> <li>• Clustered segmented areas and preprocessed depth maps into distinct categories.</li> <li>• Benchmarked the clustering results against other algorithms, including <math>K</math>-means and DBSCAN.</li> </ul> <p><b>Interactive real-time earthquake map</b> <span style="float: right;">Apr. 2017 – May 2017</span></p> <ul style="list-style-type: none"> <li>• Developed an interactive map application in Java to display global earthquake information.</li> <li>• Used <i>Processing</i> for UI and icons display, <i>Unfolding</i> for user interaction.</li> <li>• Differentiated locations, depth, levels, and occurrence time with varied icon shapes and colors.</li> </ul> <p><b>A microphone array-based system for sound source localization</b> <span style="float: right;">Mar. 2016 – May 2016</span></p> <ul style="list-style-type: none"> <li>• Developed a microphone array system with Python for sound source localization.</li> <li>• Used Raspberry Pi, Arduino UNO, a stepper motor, and an eight-microphone array.</li> <li>• Implemented DOA-TDOA &amp; GCC algorithms for sound source localization.</li> </ul>
AWARDS	<ul style="list-style-type: none"> <li>• College Student Academic Scholarship, Beijing Institute of Technology <span style="float: right;">2012 – 2015</span></li> <li>• National 3rd Prize, Chinese Exhibition of Calligraphy and Painting for Undergraduates <span style="float: right;">2013</span></li> <li>• National 3rd Prize, The 25th Chinese Chemistry Olympiad <span style="float: right;">2011</span></li> <li>• Provincial 1st Prize, The 28th Chinese Physics Olympiad <span style="float: right;">2011</span></li> <li>• Provincial 1st Prize, The 20th China High School Biology Olympiad <span style="float: right;">2011</span></li> </ul>
OTHER EXPERIENCE	<ul style="list-style-type: none"> <li>• Volunteer, Chinese New Year Festivity, <i>Orléans and Yangzhou Government</i> <span style="float: right;">Feb. 2017</span></li> <li>• Vice President, <i>Association of Calligraphy of Beijing Institute of Technology</i> <span style="float: right;">2013 – 2015</span></li> </ul>
HOBBIES	Basketball, Reading, Chinese Calligraphy, Singing, Fitness, and Cooking.