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 *(EPL2CI13)*.
- 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

Programming Python, R, C#, Java, C/C++, Swift, MATLAB, SQL
Frameworks & Tools PyTorch, scikit-learn, Unity3D, OpenCV, PowerBI, Linux, Git
Skills & Expertise Deep Learning, Machine Learning, Time Series Analysis, Signal Processing, Optimization Theory, Non-linear Regression
Languages English (proficient), French (proficient), Mandarin (native)

Selected Publications

1. **Z. Ouyang**, M. Jabloun, and P. Ravier, "Leveraging Rank Correlation and STL Decomposition for Transformer-based Time Series Forecasting," *Expert Syst. Appl.*, in preparation, 2023.
2. **Z. Ouyang**, M. Jabloun, and P. Ravier, "A Contemporary and Comprehensive Survey on Time Series Forecasting," *IEEE Trans. Knowl. Data Eng.*, in preparation, 2023.
3. **Z. Ouyang**, M. Jabloun, and P. Ravier, "STLformer: Exploit STL decomposition and Rank Correlation for Time Series Forecasting," in *Proc. EUSIPCO*, 2023.
4. **Z. Ouyang**, M. Jabloun, and P. Ravier, "Rankformer: Leverage Rank Correlation for Transformer-based Time Series Forecasting," in *Proc. IEEE SSP*, 2023.
5. G. Ouyang, K. Abed-Meraim, and **Z. Ouyang**, "Magnetic-Field-Based Indoor Positioning Using Temporal Convolutional Networks," *Sensors*, vol. 23, no. 3, p. 1514, 2023.
6. **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 *Proc. EUSIPCO*, 2022.
7. **Z. Ouyang**, P. Ravier, and M. Jabloun, "A Comparison Study of Deep Learning Models Combined with Multistep Time Series Forecasting Strategies," in *Proc. ITISE*, 2022, p. 2.
8. **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," *Eng. Proc.*, vol. 5, no. 1, p. 42, 2021.

Selected Projects

iOS application *RestauRank* Mar. 2018 – Apr. 2018

- Developed a map App to locate top-rated local restaurants and determine the fastest route.
- Google Maps SDK and Google Geolocation API for map visualization, navigation, and reviews.

Archaeological ceramic decoration segmentation Jan. 2018 – Mar. 2018

- Built 2D FCNs to segment decorated regions on ancient ceramic fragments using depth maps.
- Clustered segmented areas and preprocessed depth maps into distinct categories.
- Benchmarked the clustering results against other algorithms, including K-means and DBSCAN.

Interactive real-time earthquake map Apr. 2017 – May 2017

- Developed an interactive map application in Java to display global earthquake information.
- Used *Processing* for UI and icons display, *Unfolding* for user interaction.
- Differentiated locations, depth, levels, and occurrence time with varied icon shapes and colors.

A microphone array-based system for sound source localization Mar. 2016 – May 2016

- Developed a microphone array system with Python for sound source localization.
- Used Raspberry Pi, Arduino UNO, a stepper motor, and an eight-microphone array.
- Implemented DOA-TDOA & GCC algorithms for sound source localization.

Awards

- College Student Academic Scholarship, Beijing Institute of Technology *2012 – 2015*
- National 3rd Prize, Chinese Exhibition of Calligraphy and Painting for Undergraduates *2013*
- National 3rd Prize, The 25th Chinese Chemistry Olympiad *2011*
- Provincial 1st Prize, The 28th Chinese Physics Olympiad *2011*
- Provincial 1st Prize, The 20th China High School Biology Olympiad *2011*

Other Experience

- Volunteer, Chinese New Year Festivity, *Orléans and Yangzhou Government* *Feb. 2017*
- Vice President, *Association of Calligraphy of Beijing Institute of Technology* *2013 – 2015*

Hobbies

Basketball, Reading, Chinese Calligraphy, Singing, Fitness, and Cooking.