Dear Editors and Reviewers,

We are pleased to submit our manuscript, titled "A Meta-learning approach in movement prediction of aperiodic time-series data," for consideration as a research article in "Data analytics and mining". We confirm that this manuscript is the authors' original work and has not been published nor is it under consideration elsewhere. All authors have reviewed the manuscript and approved this submission.

In this work, we introduce Temporal Meta-learning (Temporal-ML), a novel approach that enhances the predictability of model on aperiodic time-series data by aggregating information from multiple sources to reflect the economic situation. Accordingly, predictive model can learn not only from the historical data but also the correlation between several datasets or periods of time. As a result, the model's ability to extract temporal feature and generalize to new data is improved.

Our research is relevant to "Data analytics and mining", as it focuses on mining the temporal feature as well as the market's information reflected in other datasets or periods of time. Previous methods either only used past data in prediction, or aggregated information in a simple and rigid way such as voting, averaging (ensemble model). Unlike conventional approaches, as far as we know, our method is the first work that synthesizes information based on an optimization process provided by meta-learning algorithms. Additionally, recent methods focus on decomposing the data into frequency bands, which is not suitable for aperiodic time-series data due to the aperiodicity. Experimentally, we conducted extensive experiments on real-world aperiodic datasets, demonstrating superior performance over NHITS (AAAI 2023), a typical frequency decomposition based method. We also conducted the ablation study to evaluate each component in our method. The results show that the algorithm's performance is significantly reduced when the meta-learning algorithm's information synthesis capability is absent and when the temporal feature extraction module is replaced by other models such as Transformers.

We appreciate your time and consideration and look forward to your valuable feedback.

Sincerely,

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