Thesis Progress

Theofanis Bakloris t8210094
Department of Management Science and Technology
Athens University of Economics and Business

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Time series forecasting improvement using GPT and LLM models.

1 Progress week 4

Firstly, I changed the subject of my thesis due to the difficulty in finding an appropriate dataset for anomaly detection.

So, the new subject of my thesis will be time series forecasting using Time-GPT and Time-LLM models. A prediction will be made on a dataset with both LLM or GPT models and with Neural networks. Then, all models will be compared using their Mean Absolute Error (MAE).

I have already made two of these models on a dataset about the visitors of a Public store. The neural network model has a MAE of 14.
The model using Time-GPT has a MAE of 8.

For the Time-GPT model I used the Long-horizon forecasting tutorial from NIXTLA found in this link: Time-GPT

More references are going to be added soon.

References

[1] Abdul Fatir Ansari, Lorenzo Stella, Caner Turkmen, Xiyuan Zhang, Pedro Mercado, Huibin Shen, Oleksandr Shchur, Syama Sundar Rangapuram, Sebastian Pineda Arango, Shubham Kapoor, et al. Chronos: Learning the language of time series. *arXiv preprint arXiv:2403.07815*, 2024.

[2] Abdul Fatir Ansari, Lorenzo Stella, Caner Turkmen, Xiyuan Zhang, Pedro Mercado, Huibin Shen, Oleksandr Shchur, Syama Syndar Rangapuram, Sebastian Pineda Arango, Shubham Kapoor, Jasper Zschiegner, Danielle C.

Maddix, Michael W. Mahoney, Kari Torkkola, Andrew Gordon Wilson, Michael Bohlke-Schneider, and Yuyang Wang. Chronos: Learning the language of time series. *Transactions on Machine Learning Research*, 2024.

[3] Ming Jin, Shiyu Wang, Lintao Ma, Zhixuan Chu, James Y Zhang, Xiaoming Shi, Pin-Yu Chen, Yuxuan Liang, Yuan-Fang Li, Shirui Pan, et al. Time-llm: Time series forecasting by reprogramming large language models. *arXiv preprint arXiv:2310.01728*, 2023.