Advanced ML course 2022 – proposal feedback

Team: Yaniv Tal and Miriam Horovicz
Paper: GP-VAE: Deep Probabilistic Multivariate Time Series Imputation" .

Thank you for the proposal you submitted. We have reviewed it. Here is our short feedback:

Topic	Comments/Feedback
Paper summary	The method the paper suggest is define well but it is important to also describe the problem the paper is suggesting a solution which is imputation for time series data. In the problem setting you should refer to: • Missing data problem • Classic imputation methods that don't fit for timeseries data. • VAE vs GP-VAE (structure inference vs mean field) • Reconstruction error over missing data
Innovative part Data source and evaluation	The innovative part sounds interesting, and it would be interesting to see how you use GPVAE to create synthesize high quality time series data interesting. You should use time series datasets. For example, if you will use MNIST dataset why not just use VAE or HI-VAE to generate more digits? You should start with the HMnist dataset that the paper uses and compare your results with the paper results with different sizes of observe train data. In addition, the usage of missing data as you suggest can be good to learn more generalized latent space with the given small amount of data. In addition to the HMnist, you need to try another dataset and show your results. I have already sent you some datasets, but I will add here one more dataset of human activity recognition called WISDOM which can be interesting to show your results over it. About the evaluation, I think that you should compare evaluation of original data with a data that has a fraction of the original data and your synthetic data instead of what you stated for the full data because for example for HMNIST you have 60K samples which is a lot. If you start with lets say 5K samples of different digits and for that add synthetic data and compare your results for the original data it would be interesting.
Timeline	Your timeline seems good. Try to implement the paper as soon as because it has a lot of technical parts that you need to understand.

Other	Feel free to contact me as you have already done.

Enjoy the research!