

A DEEP-LEARNING ITERATIVE STACKED APPROACH FOR PREDICTION OF REACTIVE DISSOLUTION IN POROUS MEDIA

Marcos Cirne¹ , Hannah P. Menke¹ , Alhasan Abdellatif¹ , Julien Maes¹ , Florian Doster¹ , Ahmed Elsheikh¹ 

¹Institute of GeoEnergy Engineering (IGE), School of Energy, Geoscience, Infrastructure and Society (EGIS), Heriot-Watt University, Edinburgh EH14 4AS, United Kingdom

A. MEAN SQUARED ERROR (MSE) SCORES FOR ITERATIVE PREDICTION

To quantify the error magnitudes of the iterative predictions, we also conducted an analysis of the evolution of MSE scores. Figures S1 and S2 show the MSE scores of the iterative predictions on the training and validation sets, respectively. Compared to the results discussed in Section 5.3 in the main text, the ranking of all methods on both scenarios remained the same as the ones produced by the PCC metric. These results indicate that TAU not only has a higher linear relationship to the ground truth, but also yields the smallest errors on its predictions among the tested algorithms.

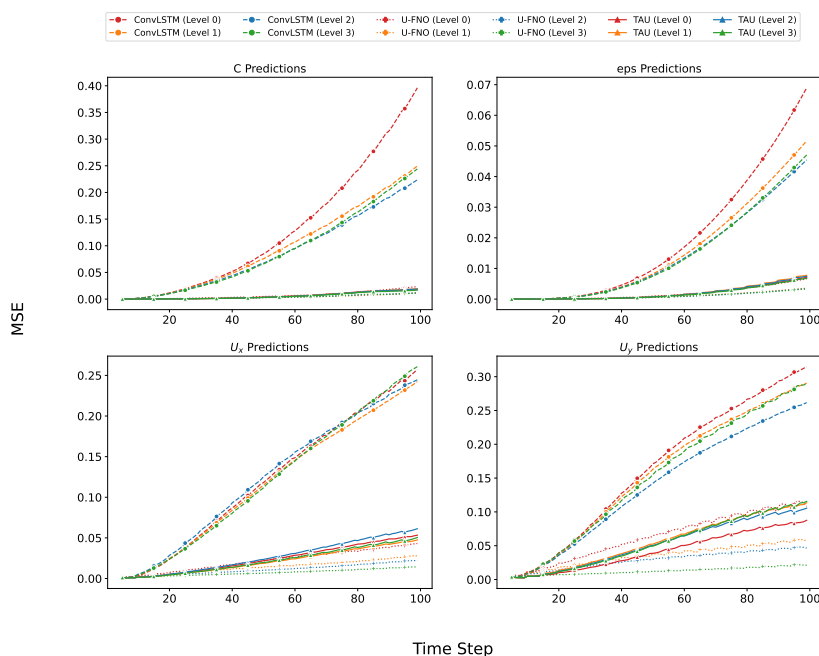


Figure S1: Average MSE scores of all samples from the training set for the iterative predictions produced by each algorithm. *ConvLSTM*: convolutional long short-term memory networks; *U-FNO*: U-shaped Fourier neural operator; *TAU*: temporal attention units.

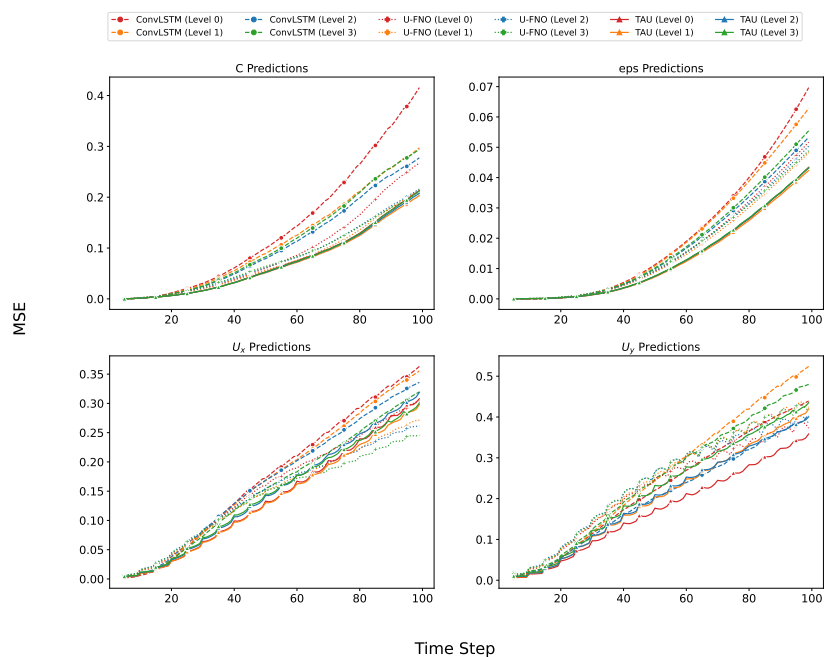


Figure S2: Average MSE scores of all samples from the validation set for the iterative predictions produced by each algorithm. *ConvLSTM*: convolutional long short-term memory networks; *U-FNO*: U-shaped Fourier neural operator; *TAU*: temporal attention units.