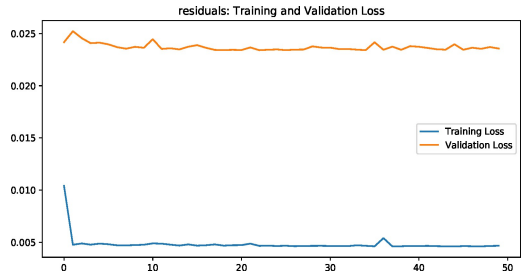

Fig. 13. The loss curves of residual sequence of ARIMA+SingleLSTM

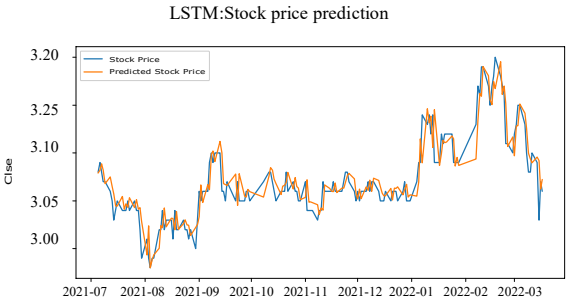

Fig. 14. The stock price prediction result of ARIMA+SingleLSTM

The stock price prediction result of ARIMA+SingleLSTM model and ARIMA+BiLSTM model are shown on Fig. 14 and Fig. 15.

The loss curve of our proposed model is shown on Fig. 16. The stock price prediction result of our proposed model is shown on Fig. 17.

C.*Compared with other methods*

The evaluation metrics are mean absolute error (MAE), root of mean square error (RMSE), mean absolute percentage error (MAPE) and R2

$$MALE = \frac{1}{N}\sum_{t=1}^{n}|\hat{x}_t - x_t|$$

$$RMSE = \sqrt{\frac{1}{n}\sum_{t=1}^{n}(\hat{x}_t - x_t)^2}$$

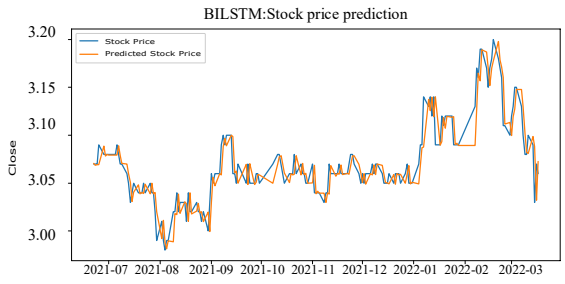

Fig. 15. The stock price prediction result of ARIMA+BiLSTM.

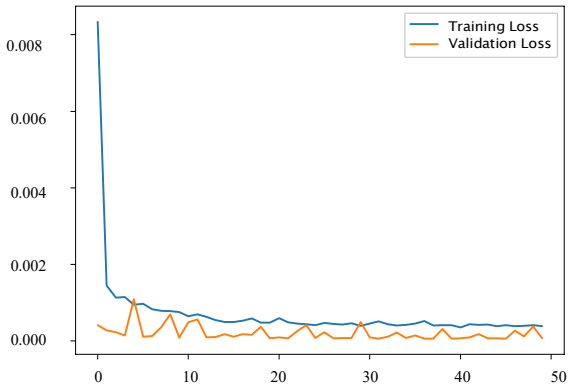

Fig. 16. The loss curve of our proposed model

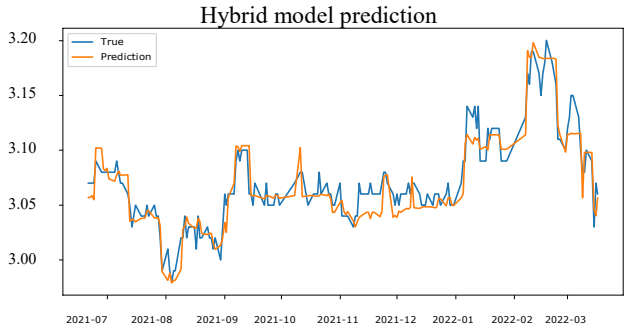

Fig. 17. The stock price prediction result of our proposed mode

$$MAPE = \frac{1}{n}\sum_{t=1}^{n}\left|\frac{\hat{x}_t - x_t}{x_t}\right| \quad (15)$$

$$R^2 = \frac{\sum_{t=1}^{n}||\hat{x}_t - \bar{x}_t||^2}{\sum_{t=1}^{n}||x_t - \bar{x}_t||^2} \quad (16)$$

Here $\bar{X}_t$ denotes the mean value of Xt. Lower error and higher R2 denote better performance.

First, we conduct comparison with different pre-training and fine-tuning models. Table III demonstrates that our proposed model outperforms other baselines.

Then, we conduct comparison with current methods. The compared methods include

TABLE3
COMPARISONWITH DIFFERENTPRETAINING AND FINE-TUNING METHOD

Pre-training	Fine-tuning	MSE	RMSE	R2MAE	
None	None	0.00057	0.02734	0.02368	0.74402
None	XGBoost	0.00031	0.01755	0.01223	0.82405
SL-LSTM	SL-LSTM	0.00045	0.02282	0.01960	0.79434
ML-LSTM	ML-LSTM	0.00031	0.01720	0.01265	0.82351
BiLSTM	BiLSTM	0.00027	0.01652	0.01201	0.84210
BiLSTM	XGBoost	0.00024	0.01605	0.01187	0.86301
CNN-BiLSTM	XGBoost	0.00022	0.01529	0.01145	0.87720
ACNN-BiLSTM	XGBoost	0.00020	0.01424	0.01126	0.88342