**Results of Different Deep Learning Model Architectures**

*Table 1: Results of Different Models*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Model | Data Split | Layers Units | Test Set RMSE  Tampa | Predicted RMSE  Tampa | Test Set RMSE  (St. Pete/Clearwater) | Predicted RMSE (St. Pete/Clearwater) |
| LSTM | 7-1.2-1.8 | 250 |  |  |  |  |
| GRU | 7-1.2-1.8 | 500 | 1.431 | 2.056 | 3.748 | 2.453 |
| XGBoost |  |  |  |  |  |  |
| Echo State Network |  |  |  |  |  |  |
| Stacked |  |  |  |  |  |  |

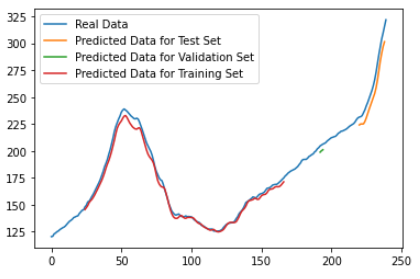
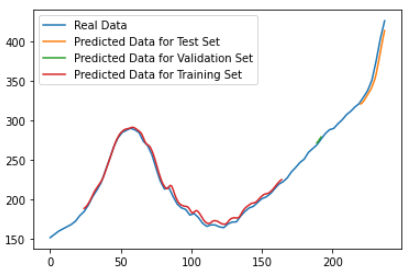
**GRU-Based Neural Network Optimization**

*Table 2: Hyperparameter Tuning for Tampa Model*

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Trial | Batch Size | Epochs | Learning Rate | Layers(Stacked) | Unit Layers | Optimizer | Dropout | Patience | TEST  RMSE | PREDICT  RMSE |
| 1 | 32 | 200 | 0.001 | 4 | 500 | Adams | 0.5 | 50 | 1.43 | 2.06 |
| 2 | 32 | 200 | 0.001 | 4 | 250 | Adams | 0.5 | 50 | 11.72 | 9.25 |
| 3 | 32 | 200 | 0.001 | 4 | 200 | Adams | 0.5 | 30 | 10.99 | 7.19 |
| 4 | 16 | 200 | 0.001 | 4 | 200 | Adams | 0.5 | 30 | 2.043 | 2.42 |

*Table 3: Hyperparameter Tuning for St. Pete / Clearwater Model*

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Trial | Batch Size | Epochs | Learning Rate | Layers(Stacked) | Unit Layers | Optimizer | Dropout | Patience | TEST  RMSE | PREDICT  RMSE |
| 1 | 64 | 200 | 0.001 | 4 | 500 | Adams | 0.5 | 50 | 5.24 | 3.38 |
| 2 | 32 | 200 | 0.001 | 4 | 250 | Adams | 0.5 | 50 | 20.15 | 14.77 |
| 3 | 32 | 250 | 0.001 | 4 | 250 | Adams | 0.5 | 30 | 26.80 | 20.12 |
| 4 | 16 | 200 | 0.001 | 4 | 200 | Adams | 0.5 | 30 | 13.08 | 8.91 |



*Figure 1: Tampa Model Figure 2: St. Pete / Clearwater Model*