Appendix

Evaluation Indices (Fly)

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | ARIMA | SARIMA | LASSO | ANN | DT | GBDT | CNN | RNN | LSTM |
| RMSE | **38.88** | **13.87** | 74.65 | 85.50 | 138.41 | 85.50 | **45.20** | 91.03 | 74.49 |
| R | **0.89** | **0.99** | 0.40 | 0.41 | 0.08 | 0.41 | **0.84** | -0.05 | 0.36 |
| POCID | **0.77** | **0.85** | 0.62 | 0.62 | 0.15 | 0.62 | **0.85** | 0.23 | 0.46 |
| MPCE | **0.871196** | **1.161124** | 0.333508 | 0.299553 | 0.005196 | 0.299553 | **0.856869** | 0.024673 | 0.253946 |

Evaluation Indices (Bicycle)

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | ARIMA | SARIMA | LASSO | ANN | DT | GBDT | CNN | RNN | LSTM |
| RMSE | 206.63 | **34.73** | 54.42 | **34.34** | 49.02 | **34.34** | **28.08** | 24.67 | 36.10 |
| R | -0.32 | **0.96** | 0.90 | **0.95** | 0.90 | **0.95** | **0.96** | 0.97 | 0.94 |
| POCID | 0.39 | **0.78** | 0.68 | **0.77** | 0.52 | **0.77** | **0.84** | 0.68 | 0.80 |
| MPCE | 0 | **1.036027** | 0.837305 | **1.02195** | 0.735245 | **1.02195** | **1.113998** | 1.000086 | 1.011739 |

Evaluation Indices (Exchange)

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | ARIMA | SARIMA | LASSO | ANN | DT | GBDT | CNN | RNN | LSTM |
| RMSE | 0.06 | 0.06 | 0.31 | 0.03 | 0.03 | 0.04 | **0.01** | **0.02** | **0.01** |
| R | 0.18 | 0.18 | -0.18 | 0.56 | 0.56 | 0.39 | **0.92** | **0.89** | **0.99** |
| POCID | 0.41 | 0.41 | 0.36 | 0.27 | 0.24 | 0.20 | **0.64** | **0.36** | **0.69** |
| MPCE | 0.244854 | 0.244854 | 0 | 0.400912 | 0.381513 | 0.263705 | **0.930458** | **0.661961** | **1.023252** |

Evaluation Indices (Temperature)

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | ARIMA | SARIMA | LASSO | ANN | DT | GBDT | CNN | RNN | LSTM |
| RMSE | 4.07 | 3.62 | 3.90 | **1.61** | 3.72 | **1.72** | 3.65 | 3.15 | 2.48 |
| R | 0.27 | 0.46 | 0.28 | **0.92** | 0.56 | **0.94** | 0.55 | 0.61 | 0.77 |
| POCID | 0.47 | 0.48 | 0.48 | **0.86** | 0.48 | **0.86** | 0.48 | 0.50 | 0.47 |
| MPCE | 0.054949 | 0.170066 | 0.080939 | **1.113362** | 0.180466 | **1.14131** | 0.190462 | 0.311822 | 0.503751 |

Evaluation Indices (SML 2010)

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | ARIMA | SARIMA | LASSO | ANN | DT | GBDT | CNN | RNN | LSTM |
| RMSE | 3.04 | 3.24 | **0.27** | 1.74 | 1.74 | 1.82 | 0.12 | **0.04** | **0.14** |
| R | 0.49 | 0.49 | **0.99** | 0.91 | 0.91 | 0.84 | 0.99 | **0.99** | **0.99** |
| POCID | 0.71 | 0.84 | **0.96** | 0.96 | 0.85 | 0.52 | 0.98 | **0.98** | **0.98** |
| MPCE | 0.183121 | 0.178228 | **1.195221** | 0.757843 | 0.692171 | 0.450463 | 1.160283 | **1.281718** | **1.254925** |

Evaluation Indices (Solar Energy)

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | ARIMA | SARIMA | LASSO | ANN | DT | GBDT | CNN | RNN | LSTM |
| RMSE | 115.83 | 108.96 | 46.48 | 75.74 | 76.20 | - | **2.95** | **7.33** | **2.63** |
| R | -0.03 | 0.00 | 0.03 | -0.38 | -0.38 | - | **1.00** | **0.99** | **1.00** |
| POCID | 0.20 | 0.00 | 0.20 | 0.03 | 0.03 | - | **0.35** | **0.27** | **0.35** |
| MPCE | 0 | 0 | 0.063612 | 0.004601 | 0.004548 | - | **0.734469** | **0.638687** | **0.736122** |

Evaluation Indices (electricity)

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | ARIMA | SARIMA | LASSO | ANN | DT | GBDT | CNN | RNN | LSTM |
| RMSE | 7.30E+15 | 8.10E+15 | 2.19E+16 | 4.70E+15 | 4.88E+15 | - | **3.21E+15** | **3.67E+15** | **2.31E+15** |
| R | 0.17 | 0.00 | 0.17 | 0.69 | 0.67 | - | **0.85** | **0.79** | **0.93** |
| POCID | 0.50 | 0.00 | 0.50 | 0.52 | 0.53 | - | **0.85** | **0.32** | **0.79** |
| MPCE | 0.253025 | 0 | 0.036806 | 0.615388 | 0.60521 | - | **1.015155** | **0.556742** | **1.062916** |

- the results are difficult to obtain due to large datasets