Supplementary Materials

**Table S1:** Performance Comparison of Machine Learning Models for Short-Term Wind Power Prediction.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Model** | **Validation** | | | | **Test** | | | |
| **RMSE** | **MSE** | **R2** | **MAE** | **MAE** | **MSE** | **RMSE** | **R2** |
| Linear Regression (Linear) | 202 | 40,946 | 0.88 | 126 | 125 | 40,943 | 202 | 0.88 |
| Linear Regression (Interactions) | 198 | 39,108 | 0.89 | 122 | 122 | 38,953 | 197 | 0.89 |
| Linear Regression (Robust) | 207 | 42,697 | 0.88 | 123 | 123 | 42,740 | 207 | 0.88 |
| Tree (Fine) | 244 | 59,315 | 0.83 | 154 | 153 | 59,425 | 244 | 0.83 |
| Tree (Medium) | 220 | 48,469 | 0.86 | 139 | 138 | 48,320 | 220 | 0.86 |
| Tree (Coarse) | 205 | 42,116 | 0.88 | 128 | 127 | 41,886 | 205 | 0.88 |
| SVM (Linear) | 204 | 41,474 | 0.88 | 124 | 123 | 41,473 | 204 | 0.88 |
| SVM (Fine) | 228 | 51,791 | 0.85 | 143 | 140 | 50,155 | 224 | 0.86 |
| SVM (Medium) | 195 | 37,890 | 0.89 | 120 | 120 | 37,710 | 194 | 0.89 |
| SVM (Coarse) | 198 | 39,353 | 0.89 | 122 | 121 | 39,387 | 198 | 0.89 |
| Efficient Linear (Efficient) | 481 | 231,613 | 0.34 | 425 | 424 | 231,254 | 481 | 0.33 |
| Efficient Linear (Efficient) | 400 | 159,782 | 0.54 | 350 | 350 | 159,562 | 399 | 0.54 |
| Ensemble (Boosted) | 201 | 40,365 | 0.88 | 127 | 126 | 40,225 | 201 | 0.88 |
| Ensemble (Bagged) | 193 | 37,410 | 0.89 | 119 | 119 | 37,297 | 193 | 0.89 |
| Neural Network (Narrow) | 195 | 37,847 | 0.89 | 121 | 120 | 38,080 | 195 | 0.89 |
| Neural Network (Medium) | 194 | 37,491 | 0.89 | 120 | 120 | 37,549 | 194 | 0.89 |
| Neural Network (Wide) | 193 | 37,280 | 0.89 | 121 | 120 | 37,071 | 193 | 0.89 |
| Neural Network (Bilayered) | 194 | 37,480 | 0.89 | 120 | 119 | 37,342 | 193 | 0.89 |
| Neural Network (Trilayered) | 193 | 37,209 | 0.89 | 119 | 118 | 37,050 | 192 | 0.89 |
| Kernel (SVM) | 312 | 97,107 | 0.72 | 205 | 190 | 86,272 | 294 | 0.75 |
| Kernel (Least) | 261 | 68,309 | 0.81 | 167 | 183 | 79,083 | 281 | 0.77 |