**Table 1.** **The Cross-Validation results for the Balanced Dataset for the five Organisms.**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SpliceSites | Model name | C1 | C11M | Model 2 | Model 1 | NPOOL13 | Model 3 | MEANPOOL13 | Model 4 | Model 5 | NPOOL12 | AVEGPOOL12 |
| Acceptor | HS | 90.2 | 91 | 92.19 | **96.65\*** | 91.1 | **92.52** | 75.81 | **94.28\*\*\*** | **95.83\*\*** | 90.24 | 91.3 |
|  | AT | 91.1 | 90.70 | 92.10 | **93.40\*** | 92.41 | **93.26\*\*\*** | 79.48 | 91.58 | **93.40\*\*** | 91.82 | 92.14 |
|  | Oryza | 88.62 | 89.24 | 90.00 | **93.00\*\*** | **92.01\*\*\*** | 92.90 | 77.1 | 90.12 | **93.16\*** | 90.1 | 91.01 |
|  | D. Mel | 90.43 | 90.00 | 90.00 | **93.17\*\*** | 93.00 | **93.52\*** | 74.62 | 89.12 | **93.09\*\*\*** | 89.94 | 90.82 |
|  | C. elegans | 95.30 | **96.33\*\*\*** | 96.24 | **96.33\*\*** | 94.02 | **97.00\*** | 85.00 | 95.15 | 96.30 | 96.10 | 95.75 |
| Average |  | 91.13 | 91.454 | 92.11 | 94.51\* | 92.508 | 93.84**\*\*\*** | 78.402 | 92.05 | 94.36**\*\*** | 91.64 | 92.204 |
| Performance ranking |  |  |  |  | First\* |  | third**\*\*\*** |  |  | second**\*\*** |  |  |
| SpliceSites | Model name | C1 | C11M | Model 2 | Model 1 | NPOOL13 | Model 3 | MEANPOOL13 | Model 4 | Model 5 | NPOOL12 | AVEGPOOL12 |
| Donor | HS | 90.14 | 92 | **92.50\*\*** | 91.49 | 91.71 | 92.08 | 86.24 | **92.13\*\*\*** | **93.00\*** | 89.86 | 90.83 |
|  | AT | 92.2 | 92.5 | 93.05 | **93.48\*\*\*** | 93.38 | **93.52\*\*** | 82.14 | **93.75\*** | 93.39 | 93.48 | 93.24 |
|  | Oryza | 89.24 | 90.14 | 91.05 | **93.02\*** | **93.00\*\*** | **92.25\*\*\*** | 76.93 | 91.15 | 92.12 | 91.21 | 91.86 |
|  | D. Mel | 90.24 | 92.00 | 92.01 | **93.40\*** | 93.05 | **93.24\*\*\*** | 83.86 | **93.45\*\*** | 93.00 | 91.25 | 92.14 |
|  | C. elegans | 93 | 95.76 | **96.00\*** | **95.85\*\*** | **92.53\*\*\*** | 95.40 | 83.62 | 95.20 | 95.24 | 94.43 | 95.00 |
| Average |  | 90.964 | 92.48 | 92.92 | 93.45\* | 92.785 | 92.7725 | 82.2925 | 93.14**\*\*\*** | 93.35**\*\*** | 91.45 | 92.0175 |
| Performance ranking |  |  |  |  | First\* |  |  |  | third**\*\*\*** | second**\*\*** |  |  |

This table depicts the 5-fold Cross-validation Results, average result across the organism distribution, and average results positions for Balanced datasets across the selected organism. With respect to validation accuracy, results highlighted shows that \* represent the best result \*\* represents the second best, \*\*\* represents the third. HS denotes Homo sapiens, Oryza denotes Oryza sativa japonica, AT denotes Arabidopsis thaliana, D. Mel denotes Drosophila melanogaster, and C. elegans denotes Caenorhabditis elegans.

**Table 2.** **The Cross-Validation results for the Imbalanced Dataset for the five Organisms.**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SpliceSites | Model name | C1 | C11M | Model 2 | Model 1 | NPOOL13 | Model 3 | MEANPOOL13 | Model 4 | Model 5 | NPOOL12 | AVEGPOOL12 |
| Acceptor | HS | 90.82 | 91.82 | **92.71\*\*\*** | **92.80\*** | 92.11 | 92.37 | 79.68 | 92.48 | **92.73\*\*** | 92.48 | 92.61 |
|  | AT | 91.13 | 92.24 | 93.02 | **93.98\*** | **93.39\*\*** | 92.09 | 86.67 | 91.58 | **92.91\*\*\*** | 92.64 | 92.74 |
|  | Oryza | 90.94 | 91.5 | 92.25 | **92.48\*\*** | 91.98 | 91.9 | 82.67 | 91.12 | **92.85\*** | 92.03 | **92.34\*\*\*** |
|  | D. Mel. | 90.79 | 91.40 | **92.19\*\*** | **92.34\*** | 92.05 | 91.67 | 80.99 | 90.12 | **92.09\*\*\*** | 91.69 | 92.07 |
|  | C. elegans | 92.00 | 96.53 | **96.76\*\*\*** | 96.80 | **97.28\*** | 96.64 | 80.75 | 96.75 | 96.33 | 96.53 | **97.01\*\*** |
| Average |  | 91.136 | 92.698 | 93.39**\*\*** | 93.68\* | 93.362 | 92.934 | 82.152 | 92.41 | 93.38 | 93.074 | 93.354 |
| Performance ranking |  |  |  | second**\*\*** | First\* |  |  |  |  | third |  |  |
| SpliceSites | Model name | C1 | C11M | Model 2 | Model 1 | NPOOL13 | Model 3 | MEANPOOL13 | Model 4 | Model 5 | NPOOL12 | AVEGPOOL12 |
| Donor | HS | 91.94 | 92.42 | **93.42\*\*\*** | **93.71\*\*** | 92.96 | **93.81\*** | 80.49 | 92.99 | 93.12 | 92.63 | 93.17 |
|  | AT | 91.95 | 92.5 | **93.78\*** | **93.60\*\*\*** | 92.64 | 93.6 | 83.2 | **93.75\*\*** | 93.36 | 93.12 | 93.39 |
|  | Oryza | 91.79 | 92.32 | **93.08\*\*** | **93.19\*** | 92.66 | 92.76 | 84.75 | 92.25 | 92.92 | 92.47 | **92.89\*\*\*** |
|  | D. Mel. | 91.93 | 92.35 | 93.12 | **94.24\*** | 93.39 | **93.86\*\*** | 80.71 | **93.75\*\*\*** | 93.00 | 92.59 | 93.49 |
|  | C. elegans | 92.2 | 96.00 | **96.84\*\*** | **96.96\*** | 96.21 | 96.05 | 81.23 | 96.25 | 95.12 | 95.47 | **96.59\*\*\*** |
| Average |  | 91.962 | 93.118 | 94.05**\*\*** | 94.34\* | 92.9125 | 93.5075 | 82.2875 | 93.80**\*\*\*** | 93.50 | 92.7025 | 93.235 |
| Performance ranking |  |  |  | second**\*\*** | First\* |  |  |  | third**\*\*\*** |  |  |  |

Table depicting the 5-fold Cross-validation Results, average result across the organism distribution, and average results positions for Imbalanced datasets across the selected organism. With respect to validation accuracy, results highlighted shows that \* represent the best result \*\* represents the second best, \*\*\* represents the third. HS denotes Homo sapiens, Oryza denotes Oryza sativa japonica, AT denotes Arabidopsis thaliana, D. Mel denotes Drosophila melanogaster, and C. elegans denotes Caenorhabditis elegans.

**Table 3.** **The Results Comparison on Balanced datasets across the selected organism.**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SpliceSites | Model name | Splice2deep | GeneSplicer | Splicerover | SpliceFinder | Model 1 | Model 3 | Model 5 |
| Acceptor | Homo sapiens | **93.26\*\*\*** | 91.82 | 93.18 | 90.77 | **95.84\*** | 91.93 | **95.28\*\*** |
|  | Arabidopsis thaliana | 91.22 | 89.52 | 91.77 | 91.40 | **93.20\*** | **92.83\*\*\*** | **92.84\*\*** |
|  | Oryza sativa japonica | 89.91 | 87.63 | N/A | 89.63 | **91.43\*** | **91.43\*\*** | **91.16\*\*\*** |
|  | Drosophila melanogaster | **93.54\*** | N/A | N/A | 89.60 | **91.77\*\*\*** | 90.73 | **92.09\*\*** |
|  | Caenorhabditis elegans | 94.60 | N/A | N/A | 95.47 | **97.00\*** | **95.77\*\*** | **95.43\*\*\*** |
| SpliceSites | Model name | Splice2deep | GeneSplicer | Splicerover | SpliceFinder | Model 1 | Model 4 | Model 5 |
| Donor | Homo sapiens | **94.30\*\*** | 89.60 | 92.12 | 90.10 | **94.63\*** | 92.13 | **92.98\*\*\*** |
|  | Arabidopsis thaliana | 92.20 | 90.10 | **93.26\*\*\*** | 91.37 | **94.10\*** | 93.15 | **93.39\*\*** |
|  | Oryza sativa japonica | 90.00 | 89.27 | N/A | 90.60 | **92.20\*\*** | **92.35\*** | **92.19\*\*\*** |
|  | Drosophila melanogaster | 91.71 | N/A | N/A | 91.23 | **93.50\*** | **93.45\*\*** | **93.05\*\*\*** |
|  | Caenorhabditis elegans | 92.57 | N/A | N/A | 93.80 | **96.07\*** | **94.92\*\*\*** | **95.24\*\*** |

This shows the results in comparison to the state of the arts. Results highlighted shows that \* represent the best result \*\* represents the second best, \*\*\* represents the third.

**Table 4.** **The Results Comparison on Imbalanced datasets across the selected organism.**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| SpliceSites | Model name | SpliceFinder | Model 1 | Model 2 | Model 5 |
| Acceptor | Homo sapiens | 90.11 | **93.12\*\*\*** | **93.80\*** | **93.24\*\*** |
|  | Arabidopsis thaliana | 89.94 | **93.92\*\*** | **94.04\*** | **93.76\*\*\*** |
|  | Oryza sativa japonica | 91.00 | **91.92\*\*** | **91.60\*\*\*** | **92.20\*** |
|  | Drosophila melanogaster | 90.35 | 91.84**\*\*\*** | **93.16\*** | **92.24\*\*** |
|  | Caenorhabditis elegans | 94.12 | **97.32\*\*** | **97.72\*** | 96.84**\*\*\*** |
| SpliceSites | Model name | SpliceFinder | Model 1 | Model 2 | Model 4 |
| Donor | Homo sapiens | 92.88 | **93.88\*\*** | **93.96\*** | **93.64\*\*\*** |
|  | Arabidopsis thaliana | **93.20\*\*\*** | 93.00 | **93.92\*** | **93.40\*\*** |
|  | Oryza sativa japonica | 91.40 | **92.52\*\*\*** | **92.84\*\*** | **93.12\*** |
|  | Drosophila melanogaster | 93.24 | **94.52\*** | **94.12\*\*** | **93.92\*\*\*** |
|  | Caenorhabditis elegans | 95.60 | **96.96\*** | **96.00\*\*\*** | **96.88\*\*** |

This shows the results in comparison to the state of the arts. Results highlighted shows that \* represent the best result \*\* represents the second best, \*\*\* represents the third.