Feature Descriptor: LBP\_hf

1. Feature Selection: CFS

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Algorithm | AUC | AC | SN | SP | PR | FM | TIME |
| J48 | 0.504 | 0.527 | 0.527 | 0.535 | 0.533 | 0.522 | 0 |
| J48 binary tree | 0.66 | 0.588 | 0.588 | 0.591 | 0.591 | 0.587 | 0 |
| AODE | 0.734 | 0.649 | 0.649 | 0.657 | 0.662 | 0.645 | 0 |
| Bayes network | 0.724 | 0.641 | 0.641 | 0.65 | 0.655 | 0.637 | 0 |
| Naïve bay | 0.725 | 0.641 | 0.641 | 0.651 | 0.658 | 0.636 | 0 |
| SVM | 0.678 | 0.679 | 0.679 | 0.672 | 0.679 | 0.679 | 0 |
| Logistic | 0.667 | 0.625 | 0.625 | 0.631 | 0.632 | 0.625 | 0 |
| SMO | 0.673 | 0.672 | 0.672 | 0.675 | 0.675 | 0.671 | 0 |
| Muti layer | 0.762 | 0.664 | 0.664 | 0.665 | 0.666 | 0.664 | 3.74 |

1. Feature Selection: Chi-Square

K=10

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Algorithm | AUC | AC | SN | SP | PR | FM | TIME |
| J48 | 0.49 | 0.489 | 0.489 | 0.492 | 0.491 | 0.487 | 0 |
| J48 binary tree | 0.564 | 0.557 | 0.557 | 0.556 | 0.557 | 0.557 | 0 |
| AODE | 0.611 | 0.557 | 0.557 | 0.562 | 0.561 | 0.556 | 0 |
| Bayes network | 0.616 | 0.588 | 0.588 | 0.595 | 0.595 | 0.585 | 0 |
| Naïve bay | 0.62 | 0.588 | 0.588 | 0.595 | 0.595 | 0.585 | 0 |
| SVM | 0.465 | 0.481 | 0.481 | 0.449 | 0.391 | 0.37 | 0 |
| Logistic | 0.545 | 0.542 | 0.542 | 0.539 | 0.541 | 0.542 | 0.35 |
| SMO | 0.579 | 0.58 | 0.58 | 0.577 | 0.58 | 0.58 | 0.03 |
| Muti layer | 0.6 | 0.557 | 0.557 | 0.557 | 0.558 | 0.557 | 87.68 |

K=20

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Algorithm | AUC | AC | SN | SP | PR | FM | TIME |
| J48 | 0.49 | 0.489 | 0.489 | 0.492 | 0.491 | 0.487 | 0 |
| J48 binary tree | 0.564 | 0.557 | 0.557 | 0.556 | 0.557 | 0.557 | 0 |
| AODE | 0.611 | 0.557 | 0.557 | 0.562 | 0.561 | 0.556 | 0 |
| Bayes network | 0.616 | 0.588 | 0.588 | 0.595 | 0.595 | 0.585 | 0 |
| Naïve bay | 0.62 | 0.588 | 0.588 | 0.595 | 0.595 | 0.585 | 0 |
| SVM | 0.465 | 0.481 | 0.481 | 0.449 | 0.391 | 0.37 | 0 |
| Logistic | 0.545 | 0.542 | 0.542 | 0.539 | 0.541 | 0.542 | 0.35 |
| SMO | 0.579 | 0.58 | 0.58 | 0.577 | 0.58 | 0.58 | 0.03 |
| Muti layer | 0.6 | 0.557 | 0.557 | 0.557 | 0.558 | 0.557 | 87.68 |

K=30

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Algorithm | AUC | AC | SN | SP | PR | FM | TIME |
| J48 | 0.49 | 0.489 | 0.489 | 0.492 | 0.491 | 0.487 | 0 |
| J48 binary tree | 0.564 | 0.557 | 0.557 | 0.556 | 0.557 | 0.557 | 0 |
| AODE | 0.611 | 0.557 | 0.557 | 0.562 | 0.561 | 0.556 | 0 |
| Bayes network | 0.616 | 0.588 | 0.588 | 0.595 | 0.595 | 0.585 | 0 |
| Naïve bay | 0.62 | 0.588 | 0.588 | 0.595 | 0.595 | 0.585 | 0 |
| SVM | 0.465 | 0.481 | 0.481 | 0.449 | 0.391 | 0.37 | 0 |
| Logistic | 0.545 | 0.542 | 0.542 | 0.539 | 0.541 | 0.542 | 0.35 |
| SMO | 0.579 | 0.58 | 0.58 | 0.577 | 0.58 | 0.58 | 0.03 |
| Muti layer | 0.6 | 0.557 | 0.557 | 0.557 | 0.558 | 0.557 | 87.68 |

K=39

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Algorithm | AUC | AC | SN | SP | PR | FM | TIME |
| J48 | 0.49 | 0.489 | 0.489 | 0.492 | 0.491 | 0.487 | 0 |
| J48 binary tree | 0.564 | 0.557 | 0.557 | 0.556 | 0.557 | 0.557 | 0 |
| AODE | 0.611 | 0.557 | 0.557 | 0.562 | 0.561 | 0.556 | 0 |
| Bayes network | 0.616 | 0.588 | 0.588 | 0.595 | 0.595 | 0.585 | 0 |
| Naïve bay | 0.62 | 0.588 | 0.588 | 0.595 | 0.595 | 0.585 | 0 |
| SVM | 0.465 | 0.481 | 0.481 | 0.449 | 0.391 | 0.37 | 0 |
| Logistic | 0.545 | 0.542 | 0.542 | 0.539 | 0.541 | 0.542 | 0.35 |
| SMO | 0.579 | 0.58 | 0.58 | 0.577 | 0.58 | 0.58 | 0.03 |
| Muti layer | 0.6 | 0.557 | 0.557 | 0.557 | 0.558 | 0.557 | 87.68 |

1. Feature Selection: Gain Ratio

K=10

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Algorithm | AUC | AC | SN | SP | PR | FM | TIME |
| J48 | 0.49 | 0.489 | 0.489 | 0.492 | 0.491 | 0.487 | 0 |
| J48 binary tree | 0.57 | 0.55 | 0.55 | 0.548 | 0.549 | 0.549 | 0 |
| AODE | 0.611 | 0.557 | 0.557 | 0.562 | 0.561 | 0.556 | 0 |
| Bayes network | 0.616 | 0.588 | 0.588 | 0.595 | 0.595 | 0. 585 | 0 |
| Naïve bay | 0.62 | 0.588 | 0.588 | 0.595 | 0.595 | 0.585 | 0 |
| SVM | 0.465 | 0.481 | 0.481 | 0.449 | 0.391 | 0.37 | 0 |
| Logistic | 0.545 | 0.542 | 0.542 | 0.539 | 0.541 | 0.542 | 0.44 |
| SMO | 0.579 | 0.58 | 0.58 | 0.577 | 0.58 | 0.58 | 0.03 |
| Muti layer |  |  |  |  |  |  | 100.48 |

K=20

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Algorithm | AUC | AC | SN | SP | PR | FM | TIME |
| J48 | 0.49 | 0.489 | 0.489 | 0.492 | 0.491 | 0.487 | 0 |
| J48 binary tree | 0.57 | 0.55 | 0.55 | 0.548 | 0.549 | 0.549 | 0 |
| AODE | 0.611 | 0.557 | 0.557 | 0.562 | 0.561 | 0.556 | 0 |
| Bayes network | 0.616 | 0.588 | 0.588 | 0.595 | 0.595 | 0. 585 | 0 |
| Naïve bay | 0.62 | 0.588 | 0.588 | 0.595 | 0.595 | 0.585 | 0 |
| SVM | 0.465 | 0.481 | 0.481 | 0.449 | 0.391 | 0.37 | 0 |
| Logistic | 0.545 | 0.542 | 0.542 | 0.539 | 0.541 | 0.542 | 0.44 |
| SMO | 0.579 | 0.58 | 0.58 | 0.577 | 0.58 | 0.58 | 0.03 |
| Muti layer |  |  |  |  |  |  | 87.68 |

K=30

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Algorithm | AUC | AC | SN | SP | PR | FM | TIME |
| J48 | 0.49 | 0.489 | 0.489 | 0.492 | 0.491 | 0.487 | 0 |
| J48 binary tree | 0.57 | 0.55 | 0.55 | 0.548 | 0.549 | 0.549 | 0 |
| AODE | 0.611 | 0.557 | 0.557 | 0.562 | 0.561 | 0.556 | 0 |
| Bayes network | 0.616 | 0.588 | 0.588 | 0.595 | 0.595 | 0. 585 | 0 |
| Naïve bay | 0.62 | 0.588 | 0.588 | 0.595 | 0.595 | 0.585 | 0 |
| SVM | 0.465 | 0.481 | 0.481 | 0.449 | 0.391 | 0.37 | 0 |
| Logistic | 0.545 | 0.542 | 0.542 | 0.539 | 0.541 | 0.542 | 0.44 |
| SMO | 0.579 | 0.58 | 0.58 | 0.577 | 0.58 | 0.58 | 0.03 |
| Muti layer |  |  |  |  |  |  | 87.68 |

K=39

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Algorithm | AUC | AC | SN | SP | PR | FM | TIME |
| J48 | 0.49 | 0.489 | 0.489 | 0.492 | 0.491 | 0.487 | 0 |
| J48 binary tree | 0.57 | 0.55 | 0.55 | 0.548 | 0.549 | 0.549 | 0 |
| AODE | 0.611 | 0.557 | 0.557 | 0.562 | 0.561 | 0.556 | 0 |
| Bayes network | 0.616 | 0.588 | 0.588 | 0.595 | 0.595 | 0. 585 | 0 |
| Naïve bay | 0.62 | 0.588 | 0.588 | 0.595 | 0.595 | 0.585 | 0 |
| SVM | 0.465 | 0.481 | 0.481 | 0.449 | 0.391 | 0.37 | 0 |
| Logistic | 0.545 | 0.542 | 0.542 | 0.539 | 0.541 | 0.542 | 0.44 |
| SMO | 0.579 | 0.58 | 0.58 | 0.577 | 0.58 | 0.58 | 0.03 |
| Muti layer |  |  |  |  |  |  | 87.68 |

1. Feature Selection: Information Gain

K=10

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Algorithm | AUC | AC | SN | SP | PR | FM | TIME |
| J48 | 0.49 | 0.489 | 0.489 | 0.492 | 0.491 | 0.487 | 0 |
| J48 binary tree | 0.576 | 0.565 | 0.565 | 0.563 | 0.565 | 0.565 | 0 |
| AODE | 0.611 | 0.557 | 0.557 | 0.562 | 0.561 | 0.556 | 0 |
| Bayes network | 0.616 | 0.588 | 0.588 | 0.595 | 0.595 | 0. 585 | 0 |
| Naïve bay | 0.62 | 0.588 | 0.588 | 0.595 | 0.595 | 0.585 | 0 |
| SVM | 0.465 | 0.481 | 0.481 | 0.449 | 0.391 | 0.37 | 0 |
| Logistic | 0.545 | 0.542 | 0.542 | 0.539 | 0.541 | 0.542 | 0.25 |
| SMO | 0.579 | 0.58 | 0.58 | 0.577 | 0.58 | 0.58 | 0.03 |
| Muti layer |  |  |  |  |  |  | 87.68 |

K=20

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Algorithm | AUC | AC | SN | SP | PR | FM | TIME |
| J48 | 0.49 | 0.489 | 0.489 | 0.492 | 0.491 | 0.487 | 0 |
| J48 binary tree | 0.576 | 0.565 | 0.565 | 0.563 | 0.565 | 0.565 | 0 |
| AODE | 0.611 | 0.557 | 0.557 | 0.562 | 0.561 | 0.556 | 0 |
| Bayes network | 0.616 | 0.588 | 0.588 | 0.595 | 0.595 | 0. 585 | 0 |
| Naïve bay | 0.62 | 0.588 | 0.588 | 0.595 | 0.595 | 0.585 | 0 |
| SVM | 0.465 | 0.481 | 0.481 | 0.449 | 0.391 | 0.37 | 0 |
| Logistic | 0.545 | 0.542 | 0.542 | 0.539 | 0.541 | 0.542 | 0.25 |
| SMO | 0.579 | 0.58 | 0.58 | 0.577 | 0.58 | 0.58 | 0.03 |
| Muti layer |  |  |  |  |  |  | 87.68 |

K=30

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Algorithm | AUC | AC | SN | SP | PR | FM | TIME |
| J48 | 0.49 | 0.489 | 0.489 | 0.492 | 0.491 | 0.487 | 0 |
| J48 binary tree | 0.576 | 0.565 | 0.565 | 0.563 | 0.565 | 0.565 | 0 |
| AODE | 0.611 | 0.557 | 0.557 | 0.562 | 0.561 | 0.556 | 0 |
| Bayes network | 0.616 | 0.588 | 0.588 | 0.595 | 0.595 | 0. 585 | 0 |
| Naïve bay | 0.62 | 0.588 | 0.588 | 0.595 | 0.595 | 0.585 | 0 |
| SVM | 0.465 | 0.481 | 0.481 | 0.449 | 0.391 | 0.37 | 0 |
| Logistic | 0.545 | 0.542 | 0.542 | 0.539 | 0.541 | 0.542 | 0.25 |
| SMO | 0.579 | 0.58 | 0.58 | 0.577 | 0.58 | 0.58 | 0.03 |
| Muti layer |  |  |  |  |  |  | 87.68 |

K=39

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Algorithm | AUC | AC | SN | SP | PR | FM | TIME |
| J48 | 0.49 | 0.489 | 0.489 | 0.492 | 0.491 | 0.487 | 0 |
| J48 binary tree | 0.576 | 0.565 | 0.565 | 0.563 | 0.565 | 0.565 | 0 |
| AODE | 0.611 | 0.557 | 0.557 | 0.562 | 0.561 | 0.556 | 0 |
| Bayes network | 0.616 | 0.588 | 0.588 | 0.595 | 0.595 | 0. 585 | 0 |
| Naïve bay | 0.62 | 0.588 | 0.588 | 0.595 | 0.595 | 0.585 | 0 |
| SVM | 0.465 | 0.481 | 0.481 | 0.449 | 0.391 | 0.37 | 0 |
| Logistic | 0.545 | 0.542 | 0.542 | 0.539 | 0.541 | 0.542 | 0.31 |
| SMO | 0.579 | 0.58 | 0.58 | 0.577 | 0.58 | 0.58 | 0.03 |
| Muti layer |  |  |  |  |  |  | 87.68 |

1. Feature Selection: Relief

K=10

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Algorithm | AUC | AC | SN | SP | PR | FM | TIME |
| J48 | 0.485 | 0.481 | 0.481 | 0.484 | 0.483 | 0.48 | 0 |
| J48 binary tree | 0.563 | 0.557 | 0.557 | 0.551 | 0.556 | 0.555 | 0 |
| AODE | 0.611 | 0.557 | 0.557 | 0.562 | 0.561 | 0.556 | 0 |
| Bayes network | 0.616 | 0.588 | 0.588 | 0.595 | 0.595 | 0. 585 | 0 |
| Naïve bay | 0.62 | 0.588 | 0.588 | 0.595 | 0.595 | 0.585 | 0 |
| SVM | 0.465 | 0.481 | 0.481 | 0.449 | 0.391 | 0.37 | 0 |
| Logistic | 0.545 | 0.542 | 0.542 | 0.539 | 0.541 | 0.542 | 0.31 |
| SMO | 0.579 | 0.58 | 0.58 | 0.577 | 0.58 | 0.58 | 0.03 |
| Muti layer |  |  |  |  |  |  | 87.68 |

K=20

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Algorithm | AUC | AC | SN | SP | PR | FM | TIME |
| J48 | 0.485 | 0.481 | 0.481 | 0.484 | 0.483 | 0.48 | 0 |
| J48 binary tree | 0.563 | 0.557 | 0.557 | 0.551 | 0.556 | 0.555 | 0 |
| AODE | 0.611 | 0.557 | 0.557 | 0.562 | 0.561 | 0.556 | 0 |
| Bayes network | 0.616 | 0.588 | 0.588 | 0.595 | 0.595 | 0. 585 | 0 |
| Naïve bay | 0.62 | 0.588 | 0.588 | 0.595 | 0.595 | 0.585 | 0 |
| SVM | 0.465 | 0.481 | 0.481 | 0.449 | 0.391 | 0.37 | 0 |
| Logistic | 0.545 | 0.542 | 0.542 | 0.539 | 0.541 | 0.542 | 0.31 |
| SMO | 0.579 | 0.58 | 0.58 | 0.577 | 0.58 | 0.58 | 0.03 |
| Muti layer |  |  |  |  |  |  | 87.68 |

K=30

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Algorithm | AUC | AC | SN | SP | PR | FM | TIME |
| J48 | 0.485 | 0.481 | 0.481 | 0.484 | 0.483 | 0.48 | 0 |
| J48 binary tree | 0.563 | 0.557 | 0.557 | 0.551 | 0.556 | 0.555 | 0 |
| AODE | 0.611 | 0.557 | 0.557 | 0.562 | 0.561 | 0.556 | 0 |
| Bayes network | 0.616 | 0.588 | 0.588 | 0.595 | 0.595 | 0. 585 | 0 |
| Naïve bay | 0.62 | 0.588 | 0.588 | 0.595 | 0.595 | 0.585 | 0 |
| SVM | 0.465 | 0.481 | 0.481 | 0.449 | 0.391 | 0.37 | 0 |
| Logistic | 0.545 | 0.542 | 0.542 | 0.539 | 0.541 | 0.542 | 0.31 |
| SMO | 0.579 | 0.58 | 0.58 | 0.577 | 0.58 | 0.58 | 0.03 |
| Muti layer |  |  |  |  |  |  | 87.68 |

K=39

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Algorithm | AUC | AC | SN | SP | PR | FM | TIME |
| J48 | 0.485 | 0.481 | 0.481 | 0.484 | 0.483 | 0.48 | 0 |
| J48 binary tree | 0.563 | 0.557 | 0.557 | 0.551 | 0.556 | 0.555 | 0 |
| AODE | 0.611 | 0.557 | 0.557 | 0.562 | 0.561 | 0.556 | 0 |
| Bayes network | 0.616 | 0.588 | 0.588 | 0.595 | 0.595 | 0. 585 | 0 |
| Naïve bay | 0.62 | 0.588 | 0.588 | 0.595 | 0.595 | 0.585 | 0 |
| SVM | 0.465 | 0.481 | 0.481 | 0.449 | 0.391 | 0.37 | 0 |
| Logistic | 0.545 | 0.542 | 0.542 | 0.539 | 0.541 | 0.542 | 0.31 |
| SMO | 0.579 | 0.58 | 0.58 | 0.577 | 0.58 | 0.58 | 0.03 |
| Muti layer |  |  |  |  |  |  | 87.68 |