Table S1

Classification Performance of Various Sampling Algorithms

in The Gaussian NB Model

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Models | Balance - scale1 | | | Glass1 | | |
| Indicators | AUC | G - mean | F - measure | AUC | G - mean | F - measure |
| BSMOTE1 | 0.6782 | 0.6708 | 0.3897 | 0.6677 | 0.6503 | 0.5819 |
| BSMOTE2 | 0.6331 | 0.6222 | 0.3420 | 0.6714 | 0.6520 | 0.5865 |
| ADASYN | 0.6813 | 0.6776 | 0.3940 | 0.6931 | 0.6637 | 0.6082 |
| SVMSMOTE | 0.6746 | 0.6446 | 0.4060 | 0.7037 | 0.6732 | 0.6176 |
| MWMOTE | 0.5583 | 0.3732 | 0.2699 | 0.7037 | 0.6738 | 0.6178 |
| KSMOTE | 0.5983 | 0.5819 | 0.3080 | 0.6963 | 0.6712 | 0.6084 |
| DPCSMOTE | 0.5600 | 0.3744 | 0.2747 | 0.7214 | 0.6898 | 0.6344 |
| LDBSMOTE | 0.7167 | 0.7067 | 0.4218 | 0.7256 | 0.6933 | 0.6372 |
| IBSM | 0.7797 | 0.7749 | 0.4941 | 0.7050 | 0.6763 | 0.6189 |
| SMOTETomek | 0.6882 | 0.6837 | 0.4034 | 0.7249 | 0.6945 | 0.6374 |
| SMOTEEENN | 0.6768 | 0.6728 | 0.3798 | 0.7143 | 0.6836 | 0.6276 |
| TomekLinks | 0.5000 | 0.0000 | NaN | 0.7000 | 0.6735 | 0.6137 |
| AllKNN | 0.5531 | 0.1536 | 0.0706 | 0.7074 | 0.6703 | 0.6222 |
| DSAOC | **0.8534** | **0.8509** | **0.5958** | **0.7280** | **0.6991** | **0.6392** |
| Models | Glass2 | | | Letter - recognition1 | | |
| Indicators | AUC | G - mean | F - measure | AUC | G - mean | F - measure |
| BSMOTE1 | 0.8379 | 0.8326 | 0.7079 | 0.5748 | 0.5430 | 0.1837 |
| BSMOTE2 | 0.8252 | 0.8230 | 0.6749 | 0.5884 | 0.5643 | 0.1940 |
| ADASYN | 0.8532 | 0.8496 | 0.7314 | 0.5824 | 0.5555 | 0.1895 |
| SVMSMOTE | 0.9061 | 0.9024 | 0.8478 | 0.6545 | 0.6518 | 0.2378 |
| MWMOTE | 0.8975 | 0.8922 | 0.8503 | **0.7911** | **0.7871** | 0.3298 |
| KSMOTE | 0.8579 | 0.8281 | 0.7941 | 0.7083 | 0.6629 | **0.4605** |
| DPCSMOTE | 0.8925 | 0.8764 | 0.8451 | 0.7759 | 0.7745 | 0.3539 |
| LDBSMOTE | 0.8525 | 0.8473 | 0.7412 | 0.5537 | 0.5118 | 0.1655 |
| IBSM | 0.9014 | 0.8924 | 0.8640 | 0.7482 | 0.7478 | 0.3573 |
| SMOTETomek | 0.9005 | 0.8725 | **0.8891** | 0.7727 | 0.7721 | 0.3600 |
| SMOTEEENN | 0.9089 | 0.9013 | 0.8518 | 0.7756 | 0.7754 | 0.3583 |
| TomekLinks | 0.8993 | 0.8907 | 0.8489 | 0.7100 | 0.6666 | 0.3327 |
| AllKNN | **0.9254** | **0.9244** | 0.8603 | 0.7110 | 0.6689 | 0.3394 |
| DSAOC | 0.9073 | 0.8978 | 0.8689 | 0.7515 | 0.7494 | 0.3482 |
| Models | Letter - recognition2 | | | Letter - recognition3 | | |
| Indicators | AUC | G - mean | F - measure | AUC | G - mean | F - measure |
| BSMOTE1 | 0.6165 | 0.6163 | 0.3312 | 0.6603 | 0.6514 | 0.1498 |
| BSMOTE2 | 0.6248 | 0.6246 | 0.3389 | 0.6680 | 0.6618 | 0.1510 |
| ADASYN | 0.6438 | 0.6427 | 0.3549 | 0.7152 | 0.7141 | 0.1719 |
| SVMSMOTE | 0.6907 | 0.6822 | 0.3909 | **0.8347** | 0.8240 | 0.2062 |
| MWMOTE | 0.7220 | 0.7143 | 0.4211 | 0.8235 | 0.8223 | 0.2383 |
| KSMOTE | 0.6512 | 0.6392 | 0.3782 | 0.7603 | 0.7515 | 0.2682 |
| DPCSMOTE | **0.7276** | **0.7236** | 0.4327 | 0.8184 | 0.8178 | 0.2421 |
| LDBSMOTE | 0.6165 | 0.6160 | 0.3323 | 0.5787 | 0.5423 | 0.1102 |
| IBSM | 0.7197 | 0.7157 | 0.4350 | 0.8253 | 0.8139 | 0.2366 |
| SMOTETomek | 0.7132 | 0.7090 | 0.4175 | 0.8123 | 0.8113 | 0.2281 |
| SMOTEEENN | 0.7151 | 0.7094 | 0.4170 | 0.8128 | 0.8116 | 0.2274 |
| TomekLinks | 0.7082 | 0.6814 | 0.4008 | 0.8294 | 0.8242 | 0.2367 |
| AllKNN | 0.7131 | 0.6897 | 0.4037 | 0.8315 | **0.8265** | 0.2361 |
| DSAOC | 0.7237 | 0.7232 | **0.4543** | 0.8201 | 0.8194 | **0.2768** |
| Models | Phishingdata1 | | | Phishingdata2 | | |
| Indicators | AUC | G - mean | F - measure | AUC | G - mean | F - measure |
| BSMOTE1 | 0.6598 | 0.6501 | 0.2178 | 0.7342 | 0.7330 | 0.4665 |
| BSMOTE2 | 0.6599 | 0.6508 | 0.2197 | 0.7299 | 0.7290 | 0.4568 |
| ADASYN | 0.6419 | 0.6346 | 0.2088 | 0.7409 | 0.7403 | 0.4684 |
| SVMSMOTE | 0.6129 | 0.6006 | 0.2024 | 0.7643 | 0.7632 | 0.5140 |
| MWMOTE | 0.6495 | 0.6412 | 0.2222 | 0.7341 | 0.7271 | 0.4858 |
| KSMOTE | 0.6864 | **0.6817** | 0.2477 | 0.7616 | 0.7573 | 0.5324 |
| DPCSMOTE | 0.6715 | 0.6648 | 0.2361 | 0.7528 | 0.7477 | 0.5103 |
| LDBSMOTE | **0.6987** | 0.6502 | 0.2430 | 0.7651 | 0.7624 | 0.5200 |
| IBSM | 0.6862 | 0.6584 | 0.2428 | 0.7521 | 0.7477 | 0.5048 |
| SMOTETomek | 0.6493 | 0.6403 | 0.2168 | 0.7492 | 0.7452 | 0.5091 |
| SMOTEEENN | 0.6769 | 0.6704 | 0.2361 | 0.7323 | 0.7257 | 0.4828 |
| TomekLinks | 0.5820 | 0.3958 | 0.2648 | 0.7259 | 0.6910 | 0.5156 |
| AllKNN | 0.5976 | 0.4399 | 0.2895 | 0.7302 | 0.6992 | 0.5126 |
| DSAOC | 0.6975 | 0.6594 | **0.2908** | **0.7722** | **0.7661** | **0.5460** |
| Models | Phishingdata3 | | | Poker - hand1 | | |
| Indicators | AUC | G - mean | F - measure | AUC | G - mean | F - measure |
| BSMOTE1 | 0.7546 | 0.7543 | 0.4377 | 0.4895 | 0.4701 | 0.1206 |
| BSMOTE2 | 0.7640 | 0.7578 | 0.4225 | 0.4911 | 0.4582 | 0.1183 |
| ADASYN | 0.7649 | 0.7644 | 0.4513 | 0.4884 | 0.4654 | 0.1191 |
| SVMSMOTE | 0.8062 | 0.8031 | 0.5061 | 0.4926 | 0.4742 | 0.1226 |
| MWMOTE | 0.7943 | 0.7931 | 0.5156 | 0.4970 | 0.4752 | 0.1274 |
| KSMOTE | 0.7724 | 0.7688 | 0.4933 | 0.5087 | 0.4683 | 0.1285 |
| DPCSMOTE | 0.7924 | 0.7905 | 0.5171 | 0.4937 | 0.4728 | 0.1248 |
| LDBSMOTE | 0.8081 | 0.8070 | 0.5229 | 0.5019 | **0.4904** | 0.1295 |
| IBSM | 0.8052 | 0.8027 | 0.5220 | 0.4979 | 0.4863 | 0.1272 |
| SMOTETomek | **0.8174** | **0.8155** | 0.5274 | 0.4881 | 0.4673 | 0.1194 |
| SMOTEEENN | 0.8093 | 0.8080 | **0.5347** | 0.4946 | 0.4883 | 0.1332 |
| TomekLinks | 0.7015 | 0.6638 | 0.4848 | 0.5000 | 0.0000 | NaN |
| AllKNN | 0.7089 | 0.6748 | 0.4906 | 0.5000 | 0.0000 | NaN |
| DSAOC | 0.7900 | 0.7869 | 0.5183 | **0.5185** | 0.4733 | **0.1347** |
| Models | Rice | | | Transfusion | | |
| Indicators | AUC | G - mean | F - measure | AUC | G - mean | F - measure |
| BSMOTE1 | 0.9069 | 0.9068 | 0.8927 | 0.6413 | 0.5944 | 0.4374 |
| BSMOTE2 | 0.9052 | 0.9051 | 0.8907 | 0.6618 | 0.6368 | 0.4742 |
| ADASYN | 0.9066 | 0.9065 | 0.8924 | 0.6523 | 0.6367 | 0.4613 |
| SVMSMOTE | 0.9046 | 0.9046 | 0.8904 | 0.6487 | 0.6212 | 0.4530 |
| MWMOTE | 0.9070 | 0.9069 | 0.8932 | 0.6417 | 0.6152 | 0.4464 |
| KSMOTE | **0.9086** | **0.9083** | **0.8959** | 0.6498 | 0.6446 | 0.4672 |
| DPCSMOTE | 0.9068 | 0.9066 | 0.8935 | 0.6246 | 0.5681 | 0.4085 |
| LDBSMOTE | 0.9055 | 0.9055 | 0.8914 | 0.5581 | 0.4073 | 0.2587 |
| IBSM | 0.9074 | 0.9072 | 0.8941 | 0.6095 | 0.5503 | 0.3797 |
| SMOTETomek | 0.9078 | 0.9076 | 0.8946 | 0.5954 | 0.5290 | 0.3670 |
| SMOTEEENN | 0.9068 | 0.9067 | 0.8933 | 0.6029 | 0.5539 | 0.3889 |
| TomekLinks | 0.9064 | 0.9063 | 0.8928 | 0.5667 | 0.4510 | 0.2958 |
| AllKNN | 0.8941 | 0.8934 | 0.8776 | 0.5819 | 0.5155 | 0.3481 |
| DSAOC | 0.9081 | 0.9078 | 0.8953 | **0.6636** | **0.6627** | **0.4867** |
| Models | Winequality1 | | | Winequality2 | | |
| Indicators | AUC | G - mean | F - measure | AUC | G - mean | F - measure |
| BSMOTE1 | 0.6845 | 0.6793 | 0.4519 | 0.6946 | 0.6938 | 0.6296 |
| BSMOTE2 | 0.6699 | 0.6624 | 0.4365 | 0.6945 | 0.6934 | **0.6301** |
| ADASYN | 0.6944 | 0.6904 | 0.4629 | 0.6935 | 0.6930 | 0.6275 |
| SVMSMOTE | 0.6852 | 0.6813 | 0.4536 | 0.6777 | 0.6773 | 0.6039 |
| MWMOTE | 0.6814 | 0.6764 | 0.4489 | 0.6847 | 0.6846 | 0.6139 |
| KSMOTE | 0.6702 | 0.6696 | 0.4428 | 0.6770 | 0.6702 | 0.5977 |
| DPCSMOTE | 0.6794 | 0.6738 | 0.4466 | 0.6902 | 0.6901 | 0.6223 |
| LDBSMOTE | 0.6952 | 0.6895 | **0.4633** | 0.6673 | 0.6638 | 0.5839 |
| IBSM | 0.6859 | 0.6806 | 0.4531 | 0.6855 | 0.6854 | 0.6161 |
| SMOTETomek | 0.6848 | 0.6795 | 0.4520 | 0.6911 | 0.6909 | 0.6235 |
| SMOTEEENN | 0.6785 | 0.6691 | 0.4437 | 0.6917 | 0.6895 | 0.6289 |
| TomekLinks | 0.7046 | 0.7016 | 0.4456 | 0.6558 | 0.6489 | 0.5639 |
| AllKNN | **0.7210** | **0.7206** | 0.4502 | 0.6806 | 0.6798 | 0.6137 |
| DSAOC | 0.6866 | 0.6857 | 0.4598 | **0.7015** | **0.7009** | 0.6300 |
| Models | Winequality3 | | | Winequality4 | | |
| Indicators | AUC | G - mean | F - measure | AUC | G - mean | F - measure |
| BSMOTE1 | 0.6087 | 0.6029 | 0.2169 | 0.5575 | 0.5292 | 0.2822 |
| BSMOTE2 | 0.6034 | 0.5930 | 0.2121 | 0.5261 | 0.4982 | 0.2627 |
| ADASYN | 0.6056 | 0.5974 | 0.2149 | **0.5583** | **0.5344** | **0.2827** |
| SVMSMOTE | 0.6053 | 0.5955 | **0.2271** | 0.5025 | 0.4919 | 0.2273 |
| MWMOTE | 0.6138 | 0.6100 | 0.2210 | 0.5128 | 0.4635 | 0.2578 |
| KSMOTE | 0.5475 | 0.5369 | 0.1829 | 0.5193 | 0.5119 | 0.2513 |
| DPCSMOTE | 0.6077 | 0.6014 | 0.2159 | 0.5358 | 0.4944 | 0.2705 |
| LDBSMOTE | 0.5503 | 0.5437 | 0.1830 | 0.5185 | 0.4896 | 0.2265 |
| IBSM | 0.6032 | 0.5948 | 0.2125 | 0.5376 | 0.4922 | 0.2719 |
| SMOTETomek | 0.6019 | 0.5952 | 0.2123 | 0.5445 | 0.4911 | 0.2765 |
| SMOTEEENN | 0.6041 | 0.5925 | 0.2121 | 0.5457 | 0.4788 | 0.2776 |
| TomekLinks | 0.5786 | 0.4584 | 0.2106 | 0.5163 | 0.2401 | 0.1028 |
| AllKNN | 0.5946 | 0.5204 | 0.2222 | 0.5254 | 0.4512 | 0.2137 |
| DSAOC | **0.6176** | **0.6142** | 0.2241 | 0.5574 | 0.5221 | 0.2593 |