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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | |  |  |  | DMRcate |  |  |  | |  | TP | FP | FN | Power | Precision | Time | | miu | avg(sd) | avg(sd) | avg(sd) | avg(sd) | avg(sd) | avg(sd) | | 0 | 0(0) | 0(0) | 0(0) | 0(0) | 0(0) | 20.342(0.93) | | 0.025 | 8.2(2.59) | 0(0) | 491.8(2.59) | 0.0164(0.01) | 1(0) | 23.46(1.23) | | 0.05 | 92.2(8.56) | 1.6(1.34) | 407.8(8.56) | 0.1844(0.02) | 0.9831(0.01) | 22.056(0.71) | | 0.1 | 191.6(5.73) | 5.8(2.95) | 308.4(5.73) | 0.3832(0.01) | 0.9708(0.01) | 23.184(1.83) | | 0.15 | 237.2(9.18) | 10.8(1.3) | 262.8(9.18) | 0.4744(0.02) | 0.9564(0.01) | 22.33(1.37) | | 0.2 | 254.4(9.53) | 12.4(2.3) | 245.6(9.53) | 0.5088(0.02) | 0.9537(0.01) | 22.262(1.39) | | 0.3 | 339.4(6.73) | 15.2(2.39) | 160.8(6.53) | 0.6785(0.01) | 0.9572(0.01) | 22.62(0.97) | | 0.4 | 392.2(5.4) | 17.2(2.59) | 108.6(5.59) | 0.7832(0.01) | 0.958(0.01) | 35.712(26.85) | | |

Table 3: True Positives (TP), False Positives (FP), False Negatives (FN), Power, Precision and Elapsed Time (in Second) for the four DMR finding methods in the simulation study.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  | Bumphunter | |  |  |
|  | TP | FP | FN | Power | Precision | Time |
| miu | avg(sd) | avg(sd) | avg(sd) | avg(sd) | avg(sd) | avg(sd) |
| 0 | 0(0) | 55(0) | 0(0) | 0(0) | 0(0) | 524.93(64.3) |
| 0.025 | 103.4(8.91) | 43(2.92) | 407.6(8.05) | 0.2023(0.02) | 0.7058(0.02) | 579.47(65.46) |
| 0.05 | 259.6(9.96) | 38(2.12) | 259.4(10.43) | 0.5002(0.02) | 0.8722(0.01) | 565.85(73.59) |
| 0.1 | 411.4(13.22) | 20.2(2.17) | 140.8(15.74) | 0.7451(0.03) | 0.9532(0) | 552.18(46.79) |
| 0.15 | 433.6(8.56) | 16(1.58) | 122(11.47) | 0.7805(0.02) | 0.9644(0) | 583.78(84.5) |
| 0.2 | 445.8(8.73) | 14(1.41) | 98(11.02) | 0.8199(0.02) | 0.9695(0) | 640.59(114.21) |
| 0.3 | 457.6(8.26) | 11.4(1.14) | 69.4(16.29) | 0.8687(0.03) | 0.9757(0) | 690.58(150.95) |
| 0.4 | 465(8.34) | 8(0.71) | 46.2(15.29) | 0.9099(0.03) | 0.9831(0) | 594.42(8.94) |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  | Probelasso | |  |  |
|  | TP | FP | FN | Power | Precision | Time |
| miu | avg(sd) | avg(sd) | avg(sd) | avg(sd) | avg(sd) | avg(sd) |
| 0 | 0(0) | 0(0) | 0(0) | 0(0) | 0(0) | 6.91(0.06) |
| 0.025 | 0(0) | 0(0) | 500(0) | 0(0) | 0(0) | 6.91(0.04) |
| 0.05 | 88.6(10.57) | 4(1.41) | 411.4(10.57) | 0.1772(0.02) | 0.9569(0.02) | 13.11(0.34) |
| 0.1 | 194.6(10.41) | 7.2(2.77) | 305.4(10.41) | 0.3892(0.02) | 0.9648(0.01) | 13.79(0.31) |
| 0.15 | 231.4(11.35) | 8.2(3.11) | 268.6(11.35) | 0.4628(0.02) | 0.9663(0.01) | 14.35(1.35) |
| 0.2 | 240.6(11.5) | 8.2(3.11) | 259.4(11.5) | 0.4812(0.02) | 0.9675(0.01) | 13.73(0.21) |
| 0.3 | 245(9.97) | 8.4(2.7) | 255(9.97) | 0.49(0.02) | 0.9672(0.01) | 13.73(0.1) |
| 0.4 | 246.8(9.31) | 8.4(2.7) | 253.2(9.31) | 0.4936(0.02) | 0.9674(0.01) | 13.59(0.37) |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  | combp |  |  |  |
|  | TP | FP | FN | Power | Precision | Time |
| miu | avg(sd) | avg(sd) | avg(sd) | avg(sd) | avg(sd) | avg(sd) |
| 0 | 0(0) | 0(0) | 0(0) | 0(0) | 0(0) | NA(0) |
| 0.025 | 42.6(6.27) | 0.2(0.45) | 457.4(6.27) | 0.0852(0.01) | 0.9963(0.01) | NA(0) |
| 0.05 | 155.2(8.67) | 0.6(0.55) | 344.8(8.67) | 0.3104(0.02) | 0.9963(0) | NA(0) |
| 0.1 | 261.4(15.21) | 2.2(1.3) | 238.6(15.21) | 0.5228(0.03) | 0.9917(0) | NA(0) |
| 0.15 | 312.6(12.76) | 2.4(1.14) | 187.4(12.76) | 0.6252(0.03) | 0.9924(0) | NA(0) |
| 0.2 | 336.6(11.3) | 2.8(1.3) | 163.4(11.3) | 0.6732(0.02) | 0.9918(0) | NA(0) |
| 0.3 | 361.4(10.24) | 2.8(1.3) | 138.6(10.24) | 0.7228(0.02) | 0.9923(0) | NA(0) |
| 0.4 | 371(9.19) | 2.8(1.3) | 129(9.19) | 0.742(0.02) | 0.9926(0) | NA(0) |