| HPO | MLS | OLS | GEM | FSR(*) | PCR(AICc) | PLS(AICc) | BST(AICc) | RBST(AIC) | BST(ICM) | RBST(ICM) |
|---|---|---|---|---|---|---|---|---|---|---|
| | abalone | 4.68e+4(9) | 47.31(6) | 47.26(3) | 48.20(8) | 47.26(5) | 47.26(3) | 47.26(3) | **47.26**(1) | 47.34(7) |
| | airfoil_self_noise | 1.55e+4(8) | 48.86(5) | 48.86(3) | 3.29e+4(9) | 49.11(7) | 48.86(3) | 48.86(3) | 48.87(6) | **48.86**(1) |
| | auto_mpg | 1.08e+3(9) | 18.44(5) | 18.42(3) | 941.33(8) | 18.84(7) | 18.42(3) | 18.42(3) | **18.42**(1) | 18.48(6) |
| | automobile | 3.59e+7(9) | **17.42**(1) | 19.69(6) | 407.18(8) | 17.44(2) | 19.69(6) | 18.74(5) | 18.55(4) | 17.46(3) |
| | concrete_data | 7.07e+15(9) | 39.17(6) | 39.14(4) | 39.57(8) | **39.06**(1) | 39.14(4) | 39.14(4) | 39.50(7) | 39.14(2) |
| | crime | 5.69e+21(9) | 35.36(6) | **34.71**(2) | 2.35e+19(7) | 2.80e+20(8) | **34.71**(2) | **34.71**(2) | 35.10(4) | 35.15(5) |
| | fertility | 2.12e+3(9) | 109.02(8) | 106.37(5) | 106.48(7) | 105.77(3) | 106.37(5) | 106.37(5) | 105.77(2) | **104.48**(1) |
| Ridge | flow | 1.17e+7(9) | 66.03(6) | 64.26(3) | 631.11(8) | 70.62(7) | 64.26(3) | 64.26(3) | 64.58(5) | **63.94**(1) |
| | forest | 4.18e+3(9) | 110.12(8) | 102.12(4) | 102.24(6) | **101.44**(1) | 102.12(4) | 102.12(4) | 102.28(7) | 102.00(2) |
| | qsar | 80.55(9) | 43.16(7) | 43.08(4) | 43.29(8) | **43.07**(1) | 43.08(4) | 43.08(4) | 43.08(6) | 43.08(2) |
| | servo | 294.63(9) | 63.52(8) | 61.49(5) | 61.45(3) | **60.02**(1) | 61.49(5) | 61.49(5) | 60.26(2) | 61.63(7) |
| | slump | 3.29e+8(9) | 90.11(6) | 86.94(3) | 101.58(8) | 90.66(7) | 86.94(3) | 86.94(3) | 89.46(5) | **86.65**(1) |
| | traffic | 3.34e+7(9) | 46.80(7) | 44.92(5) | 57.51(8) | 43.38(3) | **42.79**(1) | 44.92(5) | 43.15(2) | 44.89(4) |
| | wine_red | 1.72e+7(9) | **65.00**(1) | 65.09(5) | 69.78(8) | 65.56(7) | 65.09(5) | 65.09(5) | 65.06(2) | 65.09(3) |
| | wine_white | 6.92e+3(9) | 72.67(5) | 72.58(3) | 77.26(8) | 73.46(7) | 72.58(3) | 72.58(3) | **72.53**(1) | 72.68(6) |
| Avg. Rank | | (8.93) | (5.67) | (3.93) | (7.47) | (4.47) | (3.63) | (3.83) | (3.67) | (**3.40**) |
| | abalone | 81.96(9) | 43.90(6) | 43.03(4) | 50.84(8) | 43.91(7) | 43.03(4) | 43.03(4) | 43.02(2) | **42.95**(1) |
| | airfoil_self_noise | 4.91e+3(7) | 9.17e+6(9) | 75.59(5) | 3.28e+4(8) | 72.78(3) | 75.59(5) | 75.59(5) | 72.06(2) | **70.32**(1) |
| | auto_mpg | 9.62e+4(8) | 1.13e+6(9) | 19.96(3) | 1.86e+3(7) | 25.52(6) | 19.72(2) | 19.96(3) | 20.02(5) | **19.36**(1) |
| | automobile | 2.34e+5(9) | 41.49(7) | 21.27(3) | 424.52(8) | **19.34**(1) | 21.27(3) | 21.27(3) | 22.79(6) | 22.09(5) |
| | concrete_data | 27.95(5) | 87.80(8) | 39.98(7) | 552.91(9) | 30.24(6) | 26.97(4) | **25.22**(1) | 26.57(3) | 26.21(2) |
| | crime | 37.97(6) | 3.16e+4(9) | 36.73(4) | 180.44(8) | 41.17(7) | 36.73(4) | 36.73(4) | 35.38(2) | **35.29**(1) |
| | fertility | 191.43(9) | 104.20(5) | **102.54**(2) | 113.79(8) | 112.28(7) | **102.54**(2) | **102.54**(2) | 104.46(6) | 103.55(4) |
| SVR | flow | 4.56e+6(9) | **69.17**(1) | 71.30(2) | 927.11(8) | 106.08(7) | 78.77(5) | 71.30(2) | 74.10(4) | 79.18(6) |
| | forest | 207.68(9) | 120.89(8) | 111.18(3) | **103.94**(1) | 117.17(7) | 111.18(3) | 111.18(3) | 115.11(6) | 112.12(5) |
| | qsar | 180.92(9) | 37.08(3) | 38.02(6) | 44.88(8) | **36.48**(1) | 38.02(6) | 38.02(6) | 37.14(4) | 36.96(2) |
| | servo | 97.79(9) | 16.26(2) | 16.73(4) | 20.01(8) | 17.39(6) | 16.73(4) | 18.05(7) | 16.43(3) | **15.76**(1) |
| | slump | 8.33e+14(9) | **80.45**(1) | 114.93(5) | 536.60(8) | 96.67(4) | 116.36(6) | 85.54(2) | 131.91(7) | 86.06(3) |
| | traffic | 510.13(9) | 48.85(3) | 58.21(6) | 407.40(8) | 48.71(2) | 58.21(6) | 57.44(5) | 53.08(4) | **46.45**(1) |
| | wine_red | 59.01(3) | 60.38(5) | 67.35(7) | 3.18e+3(9) | 60.34(4) | 62.81(6) | 67.35(7) | 58.91(2) | **56.55**(1) |
| | wine_white | 289.40(8) | 99.81(6) | 70.46(5) | 3.24e+3(9) | 110.85(7) | 57.57(3) | 58.14(4) | 56.97(2) | **56.26**(1) |
| Avg. Rank | | (7.87) | (5.47) | (4.57) | (7.67) | (5.00) | (4.27) | (3.97) | (3.87) | (**2.33**) |
| | abalone | 45.11(3) | **44.66**(1) | 45.35(6) | 60.28(9) | 46.27(8) | 45.35(6) | 45.35(6) | 45.32(4) | 44.77(2) |
| | airfoil_self_noise | **12.69**(1) | 14.87(8) | 14.04(6) | 3.29e+4(9) | 13.44(3) | 14.04(6) | 14.04(6) | 13.31(2) | 13.85(4) |
| | auto_mpg | 17.82(8) | 14.44(2) | 15.48(6) | 902.37(9) | **14.30**(1) | 15.48(6) | 15.48(6) | 15.42(4) | 14.54(3) |
| | automobile | 26.03(8) | 17.61(2) | 18.08(5) | 405.11(9) | 25.13(7) | 18.08(5) | 17.72(3) | 18.04(4) | **15.32**(1) |
| | concrete_data | **11.90**(1) | 16.57(8) | 12.48(6) | 468.16(9) | 12.29(3) | 12.48(6) | 12.48(6) | 12.40(4) | 12.12(2) |
| | crime | 36.31(5) | **35.14**(1) | 36.38(7) | 35.85(3) | 36.89(9) | 36.38(7) | 36.38(7) | 36.21(4) | 35.20(2) |
| | fertility | 158.91(9) | 92.17(3) | 94.35(5) | 130.14(8) | 104.59(7) | 91.70(2) | 94.35(5) | **89.63**(1) | 93.21(4) |
| RFR | flow | 118.33(8) | 62.84(5) | 62.59(3) | 878.26(9) | 85.09(7) | 62.59(3) | 62.59(3) | **62.59**(1) | 63.24(6) |
| | forest | 200.95(9) | 126.98(8) | 116.29(5) | **104.95**(1) | 116.67(7) | 116.29(5) | 116.29(5) | 112.68(3) | 110.09(2) |
| | qsar | 38.51(7) | 37.34(2) | 38.09(5) | 45.82(9) | 38.68(8) | 38.09(5) | 38.09(5) | 38.03(3) | **37.23**(1) |
| | servo | 24.61(7) | **19.47**(1) | 19.71(2) | 33.52(9) | 27.01(8) | 19.71(2) | 22.04(6) | 19.98(4) | 21.01(5) |
| | slump | 125.29(8) | 64.29(5) | **63.94**(2) | 527.24(9) | 78.90(7) | **63.94**(2) | **63.94**(2) | 63.97(4) | 68.08(6) |
| | traffic | 49.37(3) | **44.77**(1) | 50.82(5) | 235.18(9) | 51.91(7) | 50.82(5) | 50.82(5) | 54.18(8) | 46.59(2) |
| | wine_red | 59.08(4) | **57.15**(1) | 60.08(7) | 73.18(9) | 59.51(5) | 60.08(7) | 60.08(7) | 58.90(3) | 57.56(2) |
| | wine_white | **58.59**(1) | 60.13(7) | 60.02(5) | 72.80(9) | 60.62(8) | 60.02(5) | 60.02(5) | 59.53(3) | 59.40(2) |
| Avg. Rank | | (5.47) | (3.67) | (5.10) | (8.00) | (6.33) | (4.87) | (5.17) | (3.47) | (**2.93**) |
| Mean Rank | | (7.42) | (4.93) | (4.53) | (7.71) | (5.27) | (4.26) | (4.32) | (3.67) | (**2.89**) |

Table 5: The 3-fold cross validation relative mean squared error and Friedman ranks for all the datasets when OLS and GEM and the best stop criteria among AIC, AICc, BIC, HQIC, GMDL for FSR, PCR, PLS, BST and RBST and the novel stop criterion ICM for BST and RBST, taking into account some baseline systems (Ridge, SVR and RFR) and the HB sampling strategy.