A Supplementary File for "Towards Exploratory Landscape Analysis for Large-scale Optimization: A Dimensionality Reduction Framework"

Ryoji Tanabe
Yokohama National University & Riken AIP, Japan
rt.ryoji.tanabe@gmail.com

ABSTRACT

This paper is a supplementary file for "Towards Exploratory Landscape Analysis for Large-scale Optimization: A Dimensionality Reduction Framework".

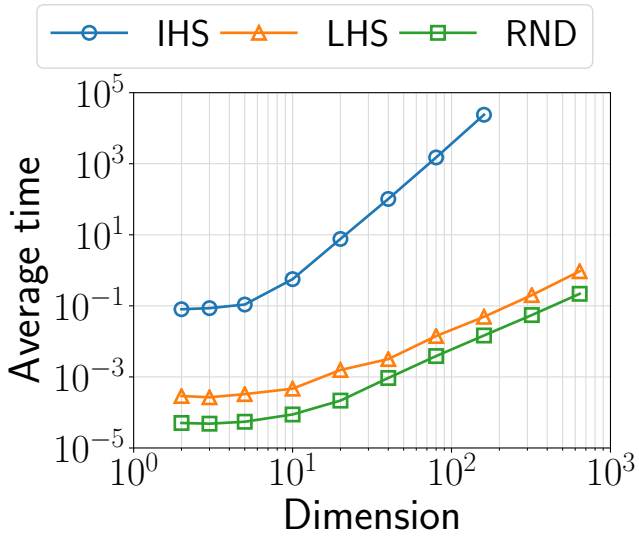


Figure S.1: Average computation time (sec) of three sampling methods over 31 runs. For each run, the three sampling methods generate a sample $\mathcal{X}$ with the size $50 \times n$ in $[0, 1]^n$, where n is the dimension. IHS is the improved Latin hypercube sampling method (`lhs` in the `flacco` package). LHS is the Latin hypercube sampling method (`lhs` in the pyDOE package). RND is the random number generator in the Python Numpy library. We stopped the run of IHS for $n = 320$ because the single-run computation of IHS did not finish within one day.

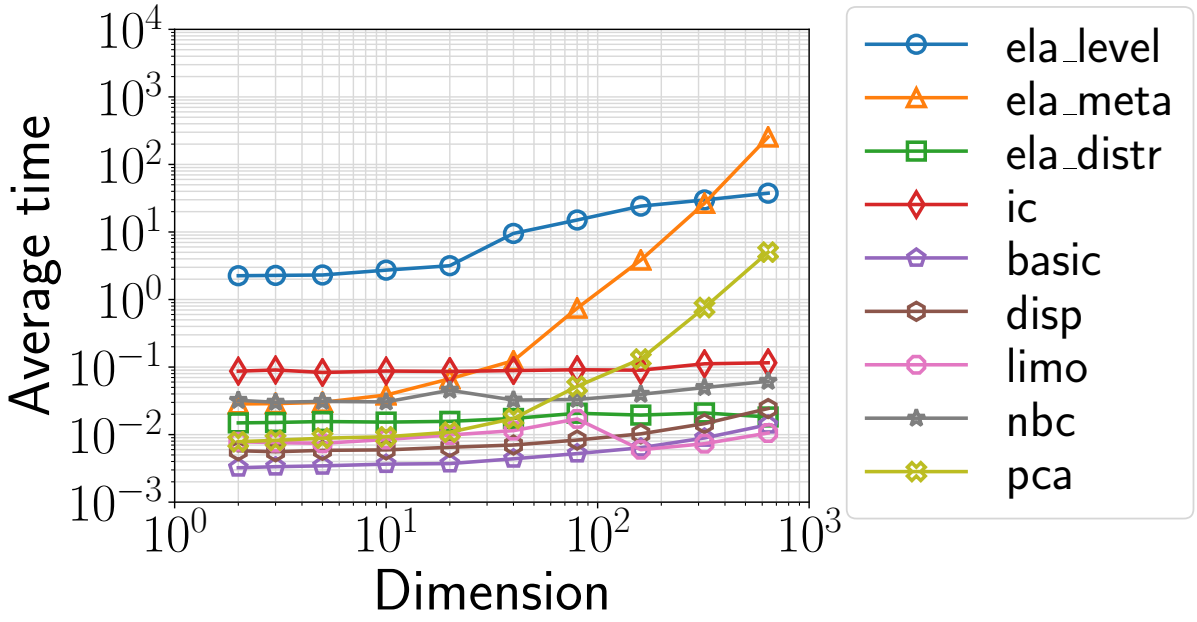


Figure S.2: Average feature computation time (sec) on the first instance of f_1 with $n \in \{2, 3, 5, 10, 20, 40, 80, 160, 320, 640\}$. The sample size $|\mathcal{X}|$ was set to 100 for all dimensions. In contrast to Figure 1 in the main paper, this figure shows how the feature computation time scale with respect to the dimension n.

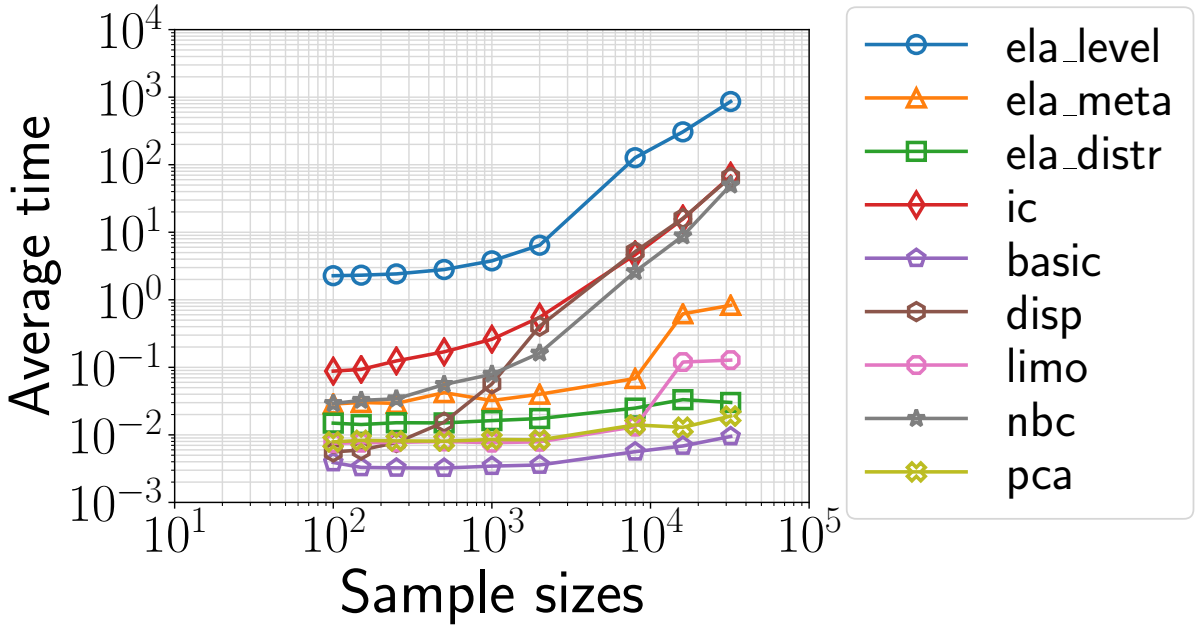


Figure S.3: Average feature computation time (sec) on the first instance of f_1 with $n = 2$. The sample size $|\mathcal{X}|$ was set to 100, 150, 250, 500, 1 000, 2 000, 8 000, 16 000, 32 000, where they correspond to 50×2, 50×3, 50×5, 50×10, 50×20, 50×40, 50×80, 50×160, 50×320, 50×640, respectively. In contrast to Figure 1 in the main paper, this figure shows how the feature computation time scale with respect to the sample size $|\mathcal{X}|$.

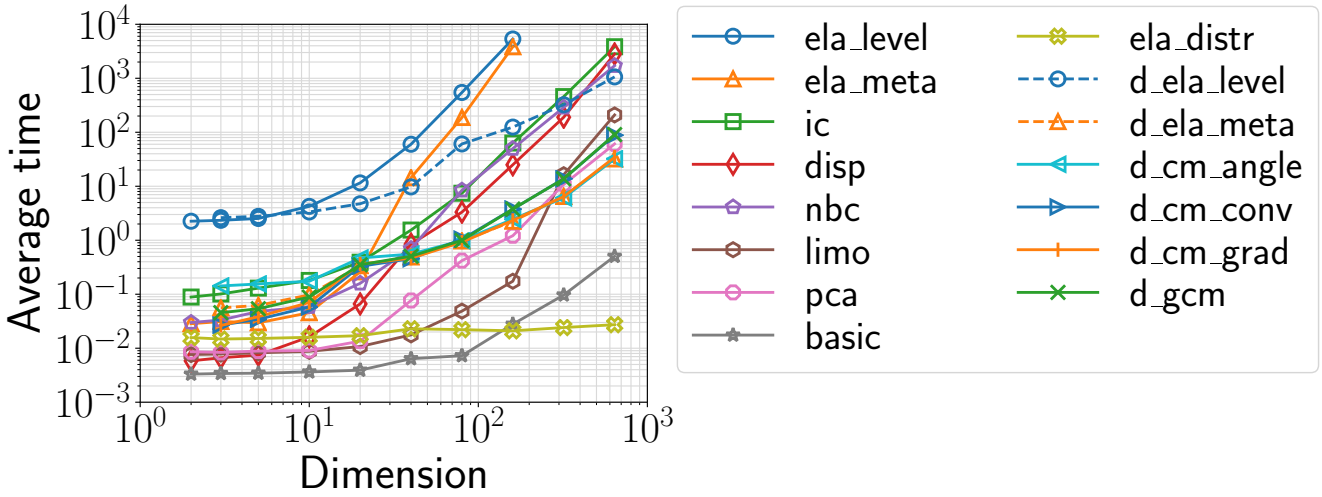


Figure S.4: Average feature computation time (sec) on the first instance of f_1 with $n \in \{2, 3, 5, 10, 20, 40, 80, 160, 320, 640\}$. This figure is an extended version of Figure 1 in the main paper by including the results of the dimensionality reduction versions of the four cell mapping features (`d_gcm`, `d_cm_angle`, `d_cm_conv`, `d_cm_grad`).

Table S.1: Average accuracy of C7, C7-E2, and C7-D2 on the 24 BBOB functions with $n \in \{2, 3, 5, 10, 20, 40, 80, 160, 320, 640\}$. The numbers in parentheses show the standard deviation.

(a) Multimodality

	C7	C7-E2	C7-D2
2	0.642 (0.404)	0.703 (0.357)	Na
3	0.569 (0.432)	0.597 (0.419)	0.578 (0.437)
5	0.536 (0.443)	0.625 (0.411)	0.622 (0.415)
10	0.522 (0.451)	0.631 (0.405)	0.647 (0.434)
20	0.531 (0.427)	0.725 (0.397)	0.639 (0.413)
40	0.556 (0.465)	0.689 (0.394)	0.617 (0.441)
80	0.600 (0.450)	0.783 (0.371)	0.622 (0.454)
160	0.522 (0.457)	0.650 (0.438)	0.561 (0.475)
320	0.544 (0.472)	Na	0.578 (0.472)
640	0.514 (0.485)	Na	0.583 (0.489)

(b) Global structure

	C7	C7-E2	C7-D2
2	0.758 (0.402)	0.786 (0.374)	Na
3	0.792 (0.381)	0.797 (0.373)	0.778 (0.389)
5	0.769 (0.395)	0.772 (0.407)	0.761 (0.412)
10	0.708 (0.424)	0.750 (0.425)	0.692 (0.435)
20	0.714 (0.426)	0.742 (0.419)	0.697 (0.440)
40	0.711 (0.460)	0.711 (0.443)	0.711 (0.460)
80	0.697 (0.444)	0.697 (0.449)	0.697 (0.453)
160	0.647 (0.447)	0.650 (0.457)	0.631 (0.463)
320	0.664 (0.474)	Na	0.667 (0.482)
640	0.667 (0.461)	Na	0.678 (0.468)

(c) Separability

	C7	C7-E2	C7-D2
2	0.756 (0.381)	0.803 (0.344)	Na
3	0.789 (0.363)	0.856 (0.336)	0.786 (0.387)
5	0.758 (0.395)	0.864 (0.322)	0.761 (0.421)
10	0.758 (0.401)	0.828 (0.344)	0.753 (0.411)
20	0.708 (0.427)	0.808 (0.377)	0.744 (0.401)
40	0.767 (0.389)	0.836 (0.349)	0.758 (0.401)
80	0.703 (0.440)	0.775 (0.405)	0.686 (0.447)
160	0.697 (0.456)	0.753 (0.421)	0.667 (0.476)
320	0.722 (0.441)	Na	0.669 (0.467)
640	0.725 (0.400)	Na	0.669 (0.453)

(d) Variable scaling

	C7	C7-E2	C7-D2
2	0.581 (0.496)	0.586 (0.495)	Na
3	0.611 (0.445)	0.583 (0.468)	0.611 (0.456)
5	0.628 (0.454)	0.600 (0.465)	0.594 (0.480)
10	0.508 (0.489)	0.556 (0.494)	0.572 (0.496)
20	0.539 (0.507)	0.578 (0.499)	0.583 (0.504)
40	0.539 (0.507)	0.581 (0.496)	0.556 (0.492)
80	0.542 (0.509)	0.583 (0.504)	0.581 (0.501)
160	0.558 (0.497)	0.583 (0.504)	0.583 (0.504)
320	0.547 (0.499)	Na	0.583 (0.504)
640	0.542 (0.509)	Na	0.542 (0.509)

(e) Homogeneity

	C7	C7-E2	C7-D2
2	0.633 (0.397)	0.636 (0.395)	Na
3	0.664 (0.378)	0.608 (0.379)	0.608 (0.389)
5	0.647 (0.399)	0.578 (0.431)	0.647 (0.408)
10	0.722 (0.380)	0.658 (0.399)	0.769 (0.338)
20	0.772 (0.369)	0.731 (0.400)	0.731 (0.403)
40	0.761 (0.385)	0.700 (0.432)	0.744 (0.407)
80	0.703 (0.450)	0.639 (0.448)	0.742 (0.412)
160	0.656 (0.477)	0.625 (0.466)	0.683 (0.439)
320	0.719 (0.438)	Na	0.761 (0.417)
640	0.772 (0.413)	Na	0.781 (0.411)

(f) Basin size

	C7	C7-E2	C7-D2
2	0.450 (0.421)	0.492 (0.409)	Na
3	0.544 (0.430)	0.547 (0.400)	0.522 (0.428)
5	0.508 (0.404)	0.628 (0.343)	0.522 (0.373)
10	0.494 (0.419)	0.608 (0.387)	0.636 (0.384)
20	0.467 (0.429)	0.647 (0.398)	0.558 (0.409)
40	0.531 (0.447)	0.617 (0.412)	0.614 (0.423)
80	0.464 (0.474)	0.650 (0.415)	0.597 (0.460)
160	0.472 (0.457)	0.578 (0.460)	0.614 (0.447)
320	0.408 (0.474)	Na	0.508 (0.446)
640	0.456 (0.477)	Na	0.528 (0.471)

(g) GL contrast

	C7	C7-E2	C7-D2
2	0.572 (0.411)	0.642 (0.335)	Na
3	0.586 (0.429)	0.600 (0.393)	0.572 (0.422)
5	0.497 (0.411)	0.669 (0.358)	0.536 (0.411)
10	0.542 (0.403)	0.656 (0.368)	0.619 (0.410)
20	0.544 (0.424)	0.728 (0.377)	0.617 (0.384)
40	0.533 (0.422)	0.708 (0.368)	0.597 (0.428)
80	0.558 (0.458)	0.703 (0.423)	0.619 (0.458)
160	0.553 (0.441)	0.636 (0.453)	0.622 (0.445)
320	0.550 (0.478)	Na	0.647 (0.436)
640	0.572 (0.481)	Na	0.614 (0.473)

(h) Overall average

	C7	C7-E2	C7-D2
2	0.627 (0.422)	0.664 (0.396)	Na
3	0.651 (0.413)	0.656 (0.406)	0.637 (0.420)
5	0.621 (0.421)	0.677 (0.399)	0.635 (0.420)
10	0.608 (0.431)	0.669 (0.407)	0.670 (0.415)
20	0.611 (0.437)	0.708 (0.410)	0.653 (0.421)
40	0.628 (0.445)	0.692 (0.415)	0.657 (0.436)
80	0.610 (0.461)	0.690 (0.430)	0.649 (0.451)
160	0.587 (0.460)	0.639 (0.453)	0.623 (0.458)
320	0.594 (0.472)	Na	0.631 (0.459)
640	0.607 (0.467)	Na	0.628 (0.467)

Table S.2: Average accuracy of C7, C7-C4, and C7-D4 on the 24 BBOB functions with $n \in \{2, 3, 5, 10, 20, 40, 80, 160, 320, 640\}$. The numbers in parentheses show the standard deviation.

(a) Multimodality

	C7	C7-C4	C7-D4
2	0.642 (0.404)	0.725 (0.368)	Na
3	0.569 (0.432)	0.622 (0.413)	0.547 (0.424)
5	0.536 (0.443)	0.633 (0.417)	0.522 (0.423)
10	0.522 (0.451)	Na	0.561 (0.414)
20	0.531 (0.427)	Na	0.550 (0.436)
40	0.556 (0.465)	Na	0.564 (0.449)
80	0.600 (0.450)	Na	0.544 (0.436)
160	0.522 (0.457)	Na	0.528 (0.445)
320	0.544 (0.472)	Na	0.542 (0.472)
640	0.514 (0.485)	Na	0.536 (0.466)

(b) Global structure

	C7	C7-C4	C7-D4
2	0.758 (0.402)	0.789 (0.359)	Na
3	0.792 (0.381)	0.797 (0.368)	0.792 (0.392)
5	0.769 (0.395)	0.783 (0.396)	0.778 (0.400)
10	0.708 (0.424)	Na	0.719 (0.426)
20	0.714 (0.426)	Na	0.733 (0.416)
40	0.711 (0.460)	Na	0.714 (0.456)
80	0.697 (0.444)	Na	0.706 (0.440)
160	0.647 (0.447)	Na	0.656 (0.453)
320	0.664 (0.474)	Na	0.664 (0.474)
640	0.667 (0.461)	Na	0.683 (0.461)

(c) Separability

	C7	C7-C4	C7-D4
2	0.756 (0.381)	0.811 (0.345)	Na
3	0.789 (0.363)	0.856 (0.337)	0.800 (0.390)
5	0.758 (0.395)	0.825 (0.352)	0.761 (0.409)
10	0.758 (0.401)	Na	0.758 (0.414)
20	0.708 (0.427)	Na	0.731 (0.410)
40	0.767 (0.389)	Na	0.775 (0.402)
80	0.703 (0.440)	Na	0.719 (0.425)
160	0.697 (0.456)	Na	0.708 (0.440)
320	0.722 (0.441)	Na	0.731 (0.433)
640	0.725 (0.400)	Na	0.744 (0.413)

(d) Variable scaling

	C7	C7-C4	C7-D4
2	0.581 (0.496)	0.586 (0.490)	Na
3	0.611 (0.445)	0.592 (0.472)	0.650 (0.457)
5	0.628 (0.454)	0.597 (0.462)	0.636 (0.469)
10	0.508 (0.489)	Na	0.528 (0.486)
20	0.539 (0.507)	Na	0.536 (0.504)
40	0.539 (0.507)	Na	0.533 (0.490)
80	0.542 (0.509)	Na	0.581 (0.501)
160	0.558 (0.497)	Na	0.583 (0.504)
320	0.547 (0.499)	Na	0.544 (0.506)
640	0.542 (0.509)	Na	0.542 (0.509)

(e) Homogeneity

	C7	C7-C4	C7-D4
2	0.633 (0.397)	0.650 (0.392)	Na
3	0.664 (0.378)	0.617 (0.364)	0.617 (0.397)
5	0.647 (0.399)	0.564 (0.435)	0.636 (0.412)
10	0.722 (0.380)	Na	0.706 (0.395)
20	0.772 (0.369)	Na	0.769 (0.367)
40	0.761 (0.385)	Na	0.781 (0.368)
80	0.703 (0.450)	Na	0.706 (0.434)
160	0.656 (0.477)	Na	0.656 (0.465)
320	0.719 (0.438)	Na	0.772 (0.408)
640	0.772 (0.413)	Na	0.758 (0.424)

(f) Basin size

	C7	C7-C4	C7-D4
2	0.450 (0.421)	0.492 (0.403)	Na
3	0.544 (0.430)	0.539 (0.389)	0.550 (0.434)
5	0.508 (0.404)	0.658 (0.324)	0.478 (0.403)
10	0.494 (0.419)	Na	0.531 (0.388)
20	0.467 (0.429)	Na	0.483 (0.425)
40	0.531 (0.447)	Na	0.533 (0.440)
80	0.464 (0.474)	Na	0.519 (0.448)
160	0.472 (0.457)	Na	0.472 (0.459)
320	0.408 (0.474)	Na	0.400 (0.478)
640	0.456 (0.477)	Na	0.492 (0.475)

(g) GL contrast

	C7	C7-C4	C7-D4
2	0.572 (0.411)	0.647 (0.362)	Na
3	0.586 (0.429)	0.608 (0.392)	0.578 (0.423)
5	0.497 (0.411)	0.689 (0.363)	0.503 (0.407)
10	0.542 (0.403)	Na	0.592 (0.419)
20	0.544 (0.424)	Na	0.558 (0.410)
40	0.533 (0.422)	Na	0.522 (0.417)
80	0.558 (0.458)	Na	0.553 (0.446)
160	0.553 (0.441)	Na	0.547 (0.440)
320	0.550 (0.478)	Na	0.550 (0.473)
640	0.572 (0.481)	Na	0.544 (0.486)

(h) Overall average

	C7	C7-C4	C7-D4
2	0.627 (0.422)	0.671 (0.398)	Na
3	0.651 (0.413)	0.662 (0.401)	0.648 (0.422)
5	0.621 (0.421)	0.679 (0.398)	0.616 (0.426)
10	0.608 (0.431)	Na	0.628 (0.423)
20	0.611 (0.437)	Na	0.623 (0.432)
40	0.628 (0.445)	Na	0.632 (0.440)
80	0.610 (0.461)	Na	0.618 (0.447)
160	0.587 (0.460)	Na	0.593 (0.457)
320	0.594 (0.472)	Na	0.600 (0.471)
640	0.607 (0.467)	Na	0.614 (0.466)

Table S.3: Average rankings of the `d_ela_meta` (`dem`) and `d_ela_level` (`del`) features in C7-D2 for $n \in \{3, 5, 10, 20, 40, 80, 160, 320, 640\}$.

(a) $n = 3$

Feature	Rank
dem.lin_simple.coef.max	10.9
dem.lin_simple.intercept	14.2
dem.lin_simple.coef.min	17.0
dem.quad_simple.adj_r2	18.3
dem.quad_w_interact.adj_r2	18.6
dem.lin_simple.adj_r2	25.2
dem.lin_w_interact.adj_r2	27.2
del.costs_runtime	36.7
del.mmce_mda_25	43.6
dem.quad_simple.cond	44.0
del.mmce_mda_10	48.0
del.mmce_lda_25	48.4
del.qda_mda_25	49.5
del.mmce_qda_25	50.5
dem.lin_simple.coef.max_by_min	51.9
del.mmce_lda_50	51.9
del.qda_mda_10	52.3
del.lda_qda_50	53.8
del.mmce_lda_10	54.7
del.lda_qda_10	55.4
del.lda_mda_50	56.3
del.lda_qda_25	58.9
del.qda_mda_50	59.2
del.mmce_mda_50	59.9
del.lda_mda_10	64.7
del.lda_mda_25	64.8
del.mmce_qda_50	67.5
del.mmce_qda_10	68.4
dem.costs_runtime	70.2

(b) $n = 5$

Feature	Rank
dem.lin_simple.coef.max	8.9
dem.lin_simple.intercept	9.6
dem.quad_simple.adj_r2	17.9
dem.lin_simple.coef.min	18.8
dem.quad_w_interact.adj_r2	20.4
dem.lin_w_interact.adj_r2	20.4
dem.lin_simple.adj_r2	21.0
del.mmce_lda_25	40.8
del.mmce_lda_10	42.5
del.mmce_mda_50	46.1
del.mmce_mda_10	46.8
del.mmce_lda_50	47.4
del.costs_runtime	48.8
del.mmce_mda_25	50.4
del.lda_qda_10	51.5
del.lda_mda_50	52.6
dem.quad_simple.cond	55.2
del.mmce_qda_25	57.6
del.qda_mda_25	57.8
del.lda_qda_50	58.1
del.lda_qda_25	58.7
dem.costs_runtime	60.3
del.qda_mda_10	60.4
del.qda_mda_50	61.6
dem.lin_simple.coef.max_by_min	63.1
del.mmce_qda_10	63.7
del.lda_mda_25	65.8
del.mmce_qda_50	67.8
del.lda_mda_10	70.5

(c) $n = 10$

Feature	Rank
dem.lin_simple.coef.max	9.1
dem.lin_simple.intercept	11.5
dem.quad_w_interact.adj_r2	16.8
dem.lin_simple.adj_r2	17.0
dem.lin_w_interact.adj_r2	17.1
dem.quad_simple.adj_r2	17.4
dem.lin_simple.coef.min	19.8
del.mmce_lda_25	43.2
del.mmce_lda_10	45.0
del.mmce_mda_25	45.4
del.mmce_mda_10	45.7
del.costs_runtime	46.6
del.mmce_mda_50	46.9
del.mmce_lda_50	49.0
dem.costs_runtime	50.4
del.lda_qda_50	52.2
del.qda_mda_10	52.4
del.lda_mda_50	52.8
del.lda_qda_10	56.3
del.qda_mda_50	56.3
del.mmce_qda_50	61.4
del.lda_mda_25	61.6
del.mmce_qda_25	63.1
dem.quad_simple.cond	63.6
del.lda_qda_25	63.8
dem.lin_simple.coef.max_by_min	64.2
del.mmce_qda_10	66.1
del.qda_mda_25	67.3
del.lda_mda_10	72.7

(d) $n = 20$

Feature	Rank
dem.lin_simple.coef.max	8.0
dem.lin_simple.intercept	11.1
dem.quad_w_interact.adj_r2	13.8
dem.lin_w_interact.adj_r2	16.3
dem.lin_simple.adj_r2	16.7
dem.quad_simple.adj_r2	16.7
dem.lin_simple.coef.min	16.9
del.mmce_mda_50	33.4
del.mmce_lda_25	34.4
del.mmce_mda_25	35.6
del.mmce_lda_10	38.2
del.mmce_mda_10	38.2
del.mmce_lda_50	44.4
del.qda_mda_10	50.9
del.lda_qda_25	51.0
del.lda_mda_50	51.1
del.lda_qda_10	51.3
del.mmce_qda_25	52.0
del.lda_qda_50	53.3
del.qda_mda_50	54.3
del.qda_mda_25	56.2
del.mmce_qda_50	59.6
del.costs_runtime	60.2
dem.lin_simple.coef.max_by_min	61.3
del.lda_mda_25	61.5
dem.quad_simple.cond	64.1
del.mmce_qda_10	65.2
dem.costs_runtime	72.0
del.lda_mda_10	74.6

(e) $n = 40$

Feature	Rank
dem.lin_simple.coef.max	9.3
dem.lin_simple.intercept	10.3
dem.quad_w_interact.adj_r2	14.1
dem.lin_w_interact.adj_r2	16.9
dem.lin_simple.adj_r2	17.4
dem.quad_simple.adj_r2	19.8
dem.lin_simple.coef.min	20.4
del.mmce_mda_50	35.6
del.mmce_mda_10	39.4
del.mmce_lda_10	39.6
del.mmce_lda_50	40.8
del.mmce_mda_25	42.7
del.mmce_lda_25	43.2
del.lda_qda_50	45.7
del.qda_mda_50	46.9
del.lda_mda_50	48.7
del.lda_qda_25	50.9
del.qda_mda_10	54.8
del.mmce_qda_10	56.3
del.lda_qda_10	56.6
del.mmce_qda_25	56.8
del.qda_mda_25	57.8
del.lda_mda_25	60.7
del.mmce_qda_50	60.8
del.costs_runtime	66.2
dem.lin_simple.coef.max_by_min	67.3
dem.quad_simple.cond	67.3
dem.costs_runtime	72.3
del.lda_mda_10	75.8

(f) $n = 80$

Feature	Rank
dem.lin_simple.coef.max	8.1
dem.lin_simple.intercept	10.1
dem.quad_w_interact.adj_r2	17.4
dem.quad_simple.adj_r2	18.5
dem.lin_simple.adj_r2	18.7
dem.lin_w_interact.adj_r2	19.0
dem.lin_simple.coef.min	24.2
del.mmce_mda_50	34.8
del.mmce_lda_25	36.6
del.mmce_lda_10	38.9
del.mmce_mda_10	39.9
del.mmce_mda_25	42.1
del.mmce_lda_50	44.1
del.qda_mda_50	44.9
del.lda_qda_50	45.0
del.mmce_qda_10	50.1
del.lda_mda_50	50.8
del.mmce_qda_25	52.5
del.costs_runtime	54.9
del.lda_qda_25	55.8
del.qda_mda_25	57.3
del.lda_qda_10	58.8
del.qda_mda_10	60.0
del.mmce_qda_50	61.1
del.lda_mda_25	62.1
dem.lin_simple.coef.max_by_min	70.1
dem.quad_simple.cond	72.3
dem.costs_runtime	73.9
del.lda_mda_10	75.7

(g) $n = 160$

Feature	Rank
dem.lin_simple.coef.max	7.6
dem.lin_simple.intercept	11.3
dem.quad_w_interact.adj_r2	18.7
dem.lin_w_interact.adj_r2	19.5
dem.lin_simple.adj_r2	20.5
dem.quad_simple.adj_r2	21.1
dem.lin_simple.coef.min	22.6
del.mmce_mda_50	28.6
del.mmce_lda_25	35.6
del.mmce_lda_50	38.4
del.mmce_mda_25	39.4
del.mmce_lda_10	40.9
del.mmce_mda_10	41.4
del.mmce_qda_25	47.2
del.mmce_qda_50	49.7
del.qda_mda_50	49.7
del.mmce_qda_10	51.8
del.lda_mda_50	52.8
del.lda_qda_25	53.2
del.lda_qda_50	54.8
del.qda_mda_10	55.6
del.qda_mda_25	56.1
del.lda_qda_10	56.3
del.lda_mda_25	61.3
del.costs_runtime	66.1
dem.quad_simple.cond	67.2
dem.lin_simple.coef.max_by_min	67.3
dem.costs_runtime	71.8
del.lda_mda_10	75.8

(h) $n = 320$

Feature	Rank
dem.lin_simple.coef.max	6.2
dem.lin_simple.intercept	13.6
dem.lin_w_interact.adj_r2	21.0
dem.lin_simple.coef.min	21.4
dem.quad_w_interact.adj_r2	23.1
dem.lin_simple.adj_r2	23.6
dem.quad_simple.adj_r2	24.4
del.mmce_lda_25	36.6
del.mmce_lda_10	36.7
del.mmce_mda_50	37.0
del.mmce_qda_25	37.2
del.mmce_mda_10	38.1
del.mmce_lda_50	38.6
del.mmce_mda_25	42.0
del.qda_mda_50	46.9
del.costs_runtime	48.8
del.mmce_qda_10	49.4
del.lda_qda_50	51.0
del.mmce_qda_50	54.9
del.lda_qda_25	55.0
del.lda_mda_50	55.4
del.lda_qda_10	56.7
del.qda_mda_25	57.5
del.qda_mda_10	58.0
del.lda_mda_25	59.7
dem.costs_runtime	68.7
dem.lin_simple.coef.max_by_min	69.9
dem.quad_simple.cond	70.1
del.lda_mda_10	74.7

(i) $n = 640$ (part 1)

Feature	Rank
dem.lin_simple.coef.max	10.4
dem.lin_simple.intercept	14.0
dem.lin_simple.coef.min	22.7
dem.quad_simple.adj_r2	22.8
dem.quad_w_interact.adj_r2	23.2
dem.lin_simple.adj_r2	23.9
dem.lin_w_interact.adj_r2	25.5
del.mmce_qda_25	29.7
del.mmce_lda_50	29.7
del.mmce_mda_50	30.1
del.mmce_lda_25	34.7
del.mmce_lda_10	36.7
del.mmce_mda_10	37.3
del.mmce_qda_10	43.3
del.mmce_mda_25	43.4

(j) $n = 640$ (part 2)

Feature	Rank
del.qda_mda_50	46.2
del.mmce_qda_50	46.8
del.lda_qda_50	51.1
del.lda_qda_25	51.3
del.qda_mda_10	53.1
del.lda_mda_50	53.8
del.lda_qda_10	55.2
del.qda_mda_25	56.3
del.lda_mda_25	64.1
dem.costs_runtime	68.9
dem.lin_simple.coef.max_by_min	69.5
dem.quad_simple.cond	69.6
del.costs_runtime	71.7
del.lda_mda_10	75.1

Table S.4: Average rankings of the `d_cm_angle` (dca), `d_cm_conv` (dcc), `d_cm_grad` (dcg), and `d_gcm` (dg) features in C7-D4 for $n \in \{3, 5, 10, 20, 40, 80, 160, 320, 640\}$.

(a) $n = 3$

Feature	Rank
dca.costs_runtime	25.4
dca.y_ratio_best2worst.mean	29.6
dca.y_ratio_best2worst.sd	39.0
dg.min.costs_runtime	39.0
dcg.costs_runtime	39.3
dg.near.costs_runtime	43.9
dca.dist_ctr2best.mean	44.5
dca.dist_ctr2worst.sd	48.5
dcg.mean	48.8
dg.mean.costs_runtime	48.8
dca.dist_ctr2best.sd	50.4
dca.angle.mean	50.7
dca.dist_ctr2worst.mean	50.8
dca.angle.sd	52.4
dcg.sd	52.8
dg.mean.basin_prob.min	61.5
dg.near.best_attr.prob	61.8
dg.near.basin_prob.min	63.1
dg.mean.best_attr.prob	63.9
dg.min.best_attr.prob	64.6
dg.near.basin_prob.max	65.2
dg.min.basin_prob.min	65.7
dg.mean.basin_prob.max	66.2
dcc.concave.soft	67.8
dcc.convex.soft	68.8
dg.min.basin_prob.max	69.4
dg.mean.basin_prob.median	70.1
dcc.costs_runtime	71.3
dcc.concave.hard	77.0
dg.near.basin_prob.median	77.6
dg.min.basin_prob.median	78.2
dg.mean.basin_uncertain.mean	81.0
dg.mean.basin_prob.mean	81.2
dg.mean.basin_uncertain.median	83.8
dg.near.basin_certain.mean	84.2
dg.min.basin_uncertain.median	85.3
dg.min.basin_uncertain.mean	85.8
dg.min.basin_prob.mean	86.9
dg.min.uncertain	87.3
dg.min.basin_uncertain.min	88.7
dcc.convex.hard	88.8
dg.min.basin_certain.sum	89.0
dg.near.uncertain	89.1
dg.near.basin_certain.sum	89.3
dg.min.basin_certain.mean	89.9
dg.mean.basin_certain.sum	90.7
dg.near.basin_uncertain.max	91.9
dg.mean.basin_uncertain.max	93.1
dg.mean.basin_certain.mean	93.2
dg.min.basin_uncertain.max	93.3
dg.min.basin_certain.max	96.6
dg.min.basin_certain.median	96.9
dg.near.basin_certain.median	97.7
dg.near.basin_uncertain.min	98.1
dg.mean.basin_certain.max	98.2
dg.mean.uncertain	98.5
dg.near.basin_uncertain.median	98.8
dg.mean.tcells	99.5
dg.mean.basin_uncertain.min	100.0
dg.near.basin_certain.max	100.3
dg.mean.basin_certain.median	102.6
dg.min.tcells	104.0
dg.near.basin_uncertain.mean	107.8
dg.near.basin_prob.mean	109.1
dg.near.attractors	109.5
dg.mean.pcells	110.5
dg.near.pcells	110.6
dg.near.tcells	110.6
dg.min.basin_certain.min	111.1
dg.mean.basin_uncertain.sum	111.1
dg.mean.attractors	111.3
dg.min.basin_uncertain.sum	112.6
dg.near.basin_certain.min	115.2
dg.mean.basin_certain.min	117.8
dg.min.pcells	120.3
dg.min.attractors	121.2
dg.near.best_attr.no	123.5

(b) $n = 5$

Feature	Rank
dca.y_ratio_best2worst.mean	20.4
dca.y_ratio_best2worst.sd	30.8
dca.angle.sd	44.2
dca.angle.mean	47.6
dca.dist_ctr2worst.mean	48.0
dca.dist_ctr2worst.sd	48.5
dcg.sd	49.8
dca.dist_ctr2best.sd	50.4
dca.dist_ctr2best.mean	51.9
dcg.mean	53.0
dg.mean.basin_prob.min	53.0
dg.near.basin_prob.min	54.8
dcg.costs_runtime	56.9
dg.near.best_attr.prob	59.4
dg.min.basin_prob.min	60.3
dcc.costs_runtime	61.1
dcc.concave.soft	61.4
dcc.convex.soft	61.9
dg.near.basin_prob.max	64.5
dg.min.basin_prob.max	65.0
dg.min.best_attr.prob	67.6
dg.near.costs_runtime	68.6
dca.costs_runtime	69.0
dg.mean.basin_prob.max	70.0
dg.mean.best_attr.prob	70.5
dg.mean.basin_prob.median	72.9
dg.near.basin_uncertain.max	75.0
dcc.concave.hard	75.3
dg.min.basin_prob.median	76.7
dg.mean.costs_runtime	77.5
dg.min.costs_runtime	80.7
dg.near.basin_prob.median	81.1
dg.min.basin_prob.mean	81.5
dg.min.basin_uncertain.mean	81.5
dg.mean.basin_uncertain.mean	81.6
dg.mean.basin_prob.mean	83.1
dg.near.uncertain	83.4
dg.near.basin_certain.mean	83.7
dg.near.basin_certain.sum	84.1
dg.mean.basin_certain.sum	85.0
dg.mean.basin_uncertain.median	86.4
dg.min.basin_uncertain.median	86.5
dg.mean.basin_uncertain.min	87.1
dg.near.basin_uncertain.min	87.8
dg.near.basin_certain.max	87.8
dg.min.basin_uncertain.max	95.0
dg.min.basin_certain.mean	95.7
dcc.convex.hard	96.1
dg.mean.basin_uncertain.max	96.9
dg.mean.basin_certain.mean	97.0
dg.near.basin_certain.median	97.1
dg.min.basin_uncertain.min	97.5
dg.mean.uncertain	97.7
dg.min.basin_certain.sum	98.5
dg.mean.basin_certain.max	99.0
dg.min.basin_certain.max	100.0
dg.min.basin_certain.median	102.0
dg.min.uncertain	102.0
dg.mean.basin_certain.median	102.5
dg.near.basin_uncertain.median	103.1
dg.mean.tcells	105.4
dg.near.basin_uncertain.mean	105.6
dg.near.attractors	106.0
dg.min.tcells	106.1
dg.near.basin_prob.mean	106.7
dg.near.tcells	108.1
dg.near.pcells	108.3
dg.mean.pcells	110.3
dg.mean.attractors	111.1
dg.mean.basin_uncertain.sum	112.0
dg.min.basin_uncertain.sum	113.2
dg.mean.basin_certain.min	114.2
dg.near.basin_certain.min	114.4
dg.min.basin_certain.min	116.1
dg.min.pcells	118.2
dg.min.attractors	118.6
dg.near.best_attr.no	123.7

(c) $n = 10$

Feature	Rank
dca.y_ratio_best2worst.mean	25.4
dca.y_ratio_best2worst.sd	28.9
dcg.mean	46.3
dg.near.basin_prob.min	47.1
dca.angle.sd	48.7
dca.angle.mean	51.2
dca.dist_ctr2worst.mean	51.8
dg.mean.basin_prob.min	52.5
dcg.sd	53.1
dca.dist_ctr2best.sd	53.2
dca.dist_ctr2worst.sd	53.8
dca.dist_ctr2best.mean	54.1
dg.near.best_attr.prob	56.0
dcg.costs_runtime	60.3
dg.min.basin_prob.min	62.2
dg.mean.best_attr.prob	65.8
dg.mean.basin_prob.max	66.2
dg.mean.basin_prob.median	66.8
dg.near.costs_runtime	66.9
dg.min.basin_prob.max	67.9
dg.min.best_attr.prob	67.9
dcc.concave.hard	68.7
dg.mean.costs_runtime	69.7
dcc.convex.soft	70.1
dcc.concave.soft	70.1
dg.near.basin_prob.max	70.1
dcc.costs_runtime	72.0
dg.near.basin_uncertain.min	72.5
dg.min.costs_runtime	73.8
dca.costs_runtime	73.9
dg.mean.basin_uncertain.median	76.3
dg.mean.basin_uncertain.mean	77.4
dg.mean.basin_prob.mean	78.1
dg.mean.basin_certain.sum	81.2
dg.near.basin_certain.sum	83.5
dg.near.uncertain	84.2
dg.mean.basin_uncertain.min	85.4
dg.near.basin_uncertain.max	86.9
dg.min.basin_prob.median	86.9
dg.near.basin_prob.median	87.8
dg.near.basin_certain.mean	88.0
dg.mean.uncertain	89.9
dg.mean.basin_certain.mean	91.2
dg.min.basin_uncertain.max	92.7
dg.mean.basin_uncertain.max	93.3
dg.min.basin_uncertain.min	93.9
dg.min.basin_uncertain.mean	94.0
dg.min.basin_prob.mean	94.0
dg.near.basin_certain.max	94.4
dg.mean.basin_certain.median	95.0
dg.mean.basin_certain.max	96.4
dg.min.basin_certain.sum	98.7
dg.min.basin_uncertain.median	99.1
dg.min.uncertain	99.2
dcc.convex.hard	99.7
dg.near.basin_certain.median	101.2
dg.min.basin_certain.mean	101.3
dg.near.basin_uncertain.median	101.8
dg.min.basin_certain.median	103.9
dg.near.basin_prob.mean	104.0
dg.near.basin_uncertain.mean	104.5
dg.min.basin_certain.max	104.5
dg.mean.tcells	104.7
dg.near.attractors	105.1
dg.near.tcells	105.4
dg.min.tcells	108.7
dg.near.pcells	108.7
dg.near.basin_certain.min	111.8
dg.mean.attractors	112.6
dg.mean.pcells	112.7
dg.mean.basin_certain.min	112.8
dg.min.basin_certain.min	113.4
dg.mean.basin_uncertain.sum	113.8
dg.min.basin_uncertain.sum	114.5
dg.min.attractors	120.5
dg.min.pcells	121.1
dg.near.best_attr.no	124.0

(d) $n = 20$

Feature	Rank
dca.y_ratio_best2worst.mean	26.1
dca.y_ratio_best2worst.sd	31.6
dca.costs_runtime	46.3
dca.dist_ctr2worst.mean	47.3
dca.dist_ctr2best.mean	47.4
dca.dist_ctr2worst.sd	51.0
dcg.sd	52.0
dcg.costs_runtime	52.8
dca.dist_ctr2best.sd	53.4
dca.angle.mean	53.4
dca.angle.sd	54.6
dcg.mean	55.2
dg.near.basin_prob.min	55.8
dg.mean.basin_prob.min	56.4
dg.near.costs_runtime	58.2
dg.mean.costs_runtime	59.4
dcc.costs_runtime	61.7
dg.mean.basin_prob.max	65.0
dg.mean.best_attr.prob	66.1
dg.min.costs_runtime	67.2
dg.min.basin_prob.min	69.0
dg.min.basin_prob.max	69.6
dg.min.best_attr.prob	69.7
dg.near.basin_certain.mean	70.2
dg.near.basin_prob.max	71.9
dg.mean.basin_prob.median	72.0
dg.near.basin_certain.sum	72.6
dg.near.uncertain	73.5
dg.near.best_attr.prob	75.1
dg.mean.basin_uncertain.min	82.0
dcc.concave.soft	82.0
dg.mean.basin_uncertain.median	82.0
dg.mean.basin_certain.sum	82.6
dcc.convex.soft	82.6
dg.mean.basin_uncertain.mean	83.0
dg.near.basin_certain.median	84.1
dg.mean.basin_prob.mean	84.8
dcc.concave.hard	85.9
dg.near.basin_uncertain.min	86.7
dg.near.basin_prob.median	87.4
dg.min.basin_uncertain.max	88.4
dg.near.basin_certain.min	89.3
dg.min.basin_prob.median	89.5
dg.mean.uncertain	90.2
dg.near.basin_uncertain.max	92.7
dg.mean.basin_certain.max	93.0
dg.mean.basin_uncertain.max	93.4
dg.mean.basin_certain.mean	95.2
dg.min.basin_uncertain.mean	95.6
dg.min.basin_prob.mean	96.2
dg.min.basin_certain.mean	96.9
dg.near.basin_certain.max	97.2
dg.min.basin_uncertain.median	98.1
dg.min.basin_certain.sum	99.5
dg.mean.basin_certain.median	99.7
dg.min.uncertain	99.8
dcc.convex.hard	100.2
dg.min.basin_certain.max	100.4
dg.min.basin_uncertain.min	101.3
dg.min.basin_certain.median	101.4
dg.near.basin_uncertain.median	105.0
dg.mean.tcells	105.4
dg.mean.pcells	111.4
dg.min.tcells	111.4
dg.near.basin_prob.mean	111.8
dg.near.basin_uncertain.mean	112.2
dg.mean.attractors	112.4
dg.near.attractors	112.9
dg.mean.basin_certain.min	113.1
dg.near.tcells	113.3
dg.mean.basin_uncertain.sum	113.3
dg.near.pcells	113.5
dg.min.basin_uncertain.sum	113.6
dg.min.basin_certain.min	116.1
dg.near.best_attr.no	117.8
dg.min.attractors	120.9
dg.min.pcells	121.3

Table S.5: Average rankings of the `d_cm_angle` (dca), `d_cm_conv` (dcc), `d_cm_grad` (dcg), and `d_gcm` (dg) features in C7-D4 for $n \in \{40, 80, 160, 320, 640\}$.

(a) $n = 40$

Feature	Rank
dca.y_ratio_best2worst.mean	34.2
dca.y_ratio_best2worst.sd	36.0
dg.mean.basin_prob.min	49.0
dca.dist_ctr2best.sd	50.3
dcg.sd	53.1
dcg.mean	53.7
dg.mean.basin_prob.median	54.5
dca.angle.mean	54.8
dca.dist_ctr2worst.mean	55.5
dca.dist_ctr2worst.sd	56.9
dcg.costs_runtime	57.8
dg.near.basin_prob.min	59.2
dcc.costs_runtime	59.7
dca.angle.sd	61.6
dca.dist_ctr2best.mean	62.6
dg.mean.basin_prob.max	64.3
dg.near.costs_runtime	64.6
dg.min.basin_prob.min	65.4
dg.mean.best_attr.prob	65.7
dg.min.best_attr.prob	66.2
dg.min.basin_prob.max	69.3
dca.costs_runtime	70.1
dg.mean.basin_uncertain.mean	71.2
dg.near.best_attr.prob	71.4
dg.mean.basin_prob.mean	72.1
dg.mean.basin_uncertain.min	72.5
dg.mean.basin_uncertain.median	72.8
dg.near.basin_prob.max	73.7
dcc.convex.soft	78.9
dg.mean.pcells	80.2
dg.mean.attractors	80.7
dcc.concave.soft	80.7
dg.min.basin_prob.median	81.0
dg.min.costs_runtime	81.8
dg.mean.costs_runtime	84.0
dg.min.uncertain	84.5
dg.near.basin_prob.median	86.8
dg.min.basin_uncertain.mean	87.0
dg.mean.basin_certain.sum	89.8
dg.mean.uncertain	90.3
dg.min.basin_prob.mean	90.4
dg.near.basin_uncertain.max	90.5
dg.near.basin_uncertain.min	91.2
dg.min.basin_uncertain.median	92.7
dg.near.basin_certain.mean	93.1
dg.mean.basin_uncertain.max	93.4
dg.mean.basin_certain.mean	93.7
dg.mean.basin_certain.median	94.1
dg.min.basin_uncertain.min	94.3
dg.min.basin_certain.sum	94.7
dg.min.basin_uncertain.max	96.0
dg.mean.tcells	98.5
dg.min.basin_certain.mean	99.2
dg.near.basin_certain.median	100.5
dg.near.uncertain	100.9
dg.near.basin_certain.sum	101.5
dg.near.basin_uncertain.median	101.8
dcc.concave.hard	103.0
dg.min.basin_certain.max	103.5
dg.min.basin_certain.median	105.1
dg.mean.basin_certain.max	105.3
dg.min.tcells	105.4
dg.near.basin_certain.max	106.0
dg.mean.basin_uncertain.sum	107.2
dg.min.basin_uncertain.sum	108.0
dg.near.basin_uncertain.mean	108.1
dg.near.basin_prob.mean	108.3
dg.near.attractors	108.3
dg.near.tcells	109.1
dg.near.pcells	109.9
dg.mean.basin_certain.min	110.1
dcc.convex.hard	113.5
dg.min.basin_certain.min	117.3
dg.near.basin_certain.min	120.3
dg.min.attractors	120.6
dg.min.pcells	120.7
dg.near.best_attr.no	124.7

(b) $n = 80$

Feature	Rank
dca.y_ratio_best2worst.mean	40.5
dca.y_ratio_best2worst.sd	44.6
dca.angle.mean	48.9
dca.angle.sd	54.4
dg.mean.basin_prob.min	54.9
dca.dist_ctr2best.mean	55.3
dcg.sd	55.4
dcg.costs_runtime	56.7
dcg.mean	58.4
dcc.costs_runtime	58.9
dca.dist_ctr2worst.sd	59.9
dca.dist_ctr2worst.mean	60.0
dca.dist_ctr2best.sd	60.2
dg.near.costs_runtime	61.7
dg.mean.best_attr.prob	63.1
dg.mean.basin_prob.max	64.3
dg.min.basin_prob.min	64.5
dca.costs_runtime	65.6
dg.mean.basin_prob.median	65.7
dg.min.best_attr.prob	66.7
dg.near.basin_prob.max	69.1
dg.min.basin_prob.max	70.1
dcc.concave.soft	72.3
dg.near.best_attr.prob	72.6
dg.near.basin_prob.min	73.0
dcc.convex.soft	73.7
dg.mean.basin_prob.mean	74.7
dg.mean.basin_uncertain.median	76.6
dg.mean.basin_uncertain.mean	76.7
dg.min.basin_prob.median	79.9
dg.near.basin_prob.median	82.4
dg.near.basin_certain.mean	83.4
dg.mean.costs_runtime	84.7
dg.near.basin_certain.sum	85.4
dg.min.basin_uncertain.mean	86.2
dg.mean.basin_uncertain.min	86.2
dg.mean.basin_uncertain.max	87.4
dg.min.basin_prob.mean	87.7
dg.mean.basin_certain.sum	88.9
dg.near.uncertain	89.0
dg.near.basin_certain.max	89.2
dg.min.basin_uncertain.median	90.2
dg.min.basin_uncertain.min	90.8
dg.mean.uncertain	91.2
dg.mean.basin_certain.mean	91.5
dg.min.costs_runtime	92.2
dg.min.basin_certain.sum	93.0
dg.mean.basin_certain.median	94.4
dg.min.basin_certain.mean	96.8
dg.near.basin_uncertain.max	96.9
dg.min.basin_uncertain.max	97.6
dcc.concave.hard	98.3
dcc.convex.hard	98.7
dg.mean.basin_certain.max	98.8
dg.min.basin_certain.max	99.3
dg.min.basin_certain.median	100.5
dg.mean.tcells	101.7
dg.min.uncertain	102.1
dg.near.basin_certain.median	104.0
dg.near.basin_uncertain.min	104.7
dg.min.basin_uncertain.sum	105.2
dg.mean.basin_uncertain.sum	105.3
dg.mean.pcells	106.2
dg.near.basin_uncertain.median	107.0
dg.mean.attractors	107.2
dg.min.tcells	109.0
dg.mean.basin_certain.min	109.2
dg.min.basin_certain.min	112.3
dg.near.basin_certain.min	112.9
dg.near.basin_uncertain.mean	113.4
dg.near.tcells	114.2
dg.near.basin_prob.mean	114.7
dg.near.pcells	114.7
dg.near.attractors	115.4
dg.min.pcells	116.8
dg.near.best_attr.no	118.8
dg.min.attractors	119.1

(c) $n = 160$

Feature	Rank
dca.y_ratio_best2worst.mean	43.4
dca.y_ratio_best2worst.sd	45.2
dcc.costs_runtime	47.4
dca.angle.mean	48.4
dcg.sd	50.6
dca.angle.sd	51.6
dcg.mean	51.6
dcg.costs_runtime	55.2
dg.mean.basin_prob.min	56.6
dg.near.costs_runtime	58.0
dca.dist_ctr2worst.sd	58.7
dg.near.basin_prob.max	60.3
dg.min.basin_prob.min	60.6
dca.dist_ctr2best.sd	61.3
dca.dist_ctr2best.mean	61.5
dca.dist_ctr2worst.mean	61.9
dg.near.basin_prob.min	64.1
dg.min.best_attr.prob	66.6
dg.mean.basin_prob.max	66.6
dca.costs_runtime	68.2
dg.near.basin_prob.median	68.9
dg.min.basin_prob.max	69.2
dg.near.best_attr.prob	70.5
dg.near.basin_certain.mean	74.1
dg.mean.best_attr.prob	75.1
dcc.concave.soft	75.6
dcc.convex.soft	76.6
dg.near.uncertain	77.9
dg.min.basin_prob.median	78.3
dg.near.basin_certain.sum	78.8
dg.mean.basin_prob.median	83.1
dg.min.basin_prob.mean	83.2
dg.mean.basin_prob.mean	84.3
dg.min.basin_uncertain.min	84.4
dg.near.basin_uncertain.min	85.0
dg.mean.basin_uncertain.mean	85.4
dg.min.basin_uncertain.median	85.5
dcc.concave.hard	86.8
dg.min.basin_uncertain.mean	87.1
dg.near.basin_certain.max	87.9
dg.mean.basin_uncertain.median	88.2
dg.near.basin_uncertain.median	88.5
dg.near.basin_uncertain.max	89.0
dg.mean.basin_uncertain.min	91.1
dg.near.basin_certain.median	93.0
dg.min.basin_certain.mean	93.1
dg.min.uncertain	94.4
dg.min.basin_uncertain.max	95.2
dg.min.basin_certain.sum	96.3
dg.min.basin_certain.median	97.3
dg.mean.tcells	98.3
dg.mean.costs_runtime	98.7
dg.mean.uncertain	98.9
dg.min.costs_runtime	99.8
dg.min.basin_certain.max	100.1
dg.mean.basin_certain.sum	101.7
dg.near.pcells	103.8
dg.min.tcells	103.9
dg.near.basin_prob.mean	103.9
dg.near.basin_certain.min	104.5
dg.mean.basin_uncertain.max	104.8
dg.near.tcells	105.3
dg.mean.basin_certain.mean	105.6
dg.near.attractors	106.2
dcc.convex.hard	106.9
dg.near.basin_uncertain.mean	106.9
dg.mean.basin_certain.median	107.5
dg.mean.basin_certain.max	110.3
dg.mean.basin_uncertain.sum	111.3
dg.min.basin_uncertain.sum	111.7
dg.min.basin_certain.min	111.8
dg.mean.attractors	115.0
dg.near.best_attr.no	116.9
dg.min.attractors	117.1
dg.min.pcells	117.7
dg.mean.pcells	118.3
dg.mean.basin_certain.min	118.6

(d) $n = 320$

Feature	Rank
dca.y_ratio_best2worst.sd	43.2
dca.y_ratio_best2worst.mean	46.5
dca.angle.mean	49.2
dcc.costs_runtime	49.3
dg.near.costs_runtime	49.9
dca.angle.sd	51.2
dcg.costs_runtime	51.8
dca.dist_ctr2worst.mean	52.7
dca.dist_ctr2best.sd	53.6
dca.dist_ctr2worst.sd	55.8
dcg.mean	55.9
dca.dist_ctr2best.mean	56.3
dg.min.basin_prob.min	57.1
dca.costs_runtime	57.5
dg.near.basin_prob.min	61.2
dg.mean.basin_prob.max	61.3
dg.near.basin_prob.max	61.9
dg.mean.basin_prob.min	63.7
dg.mean.best_attr.prob	64.2
dg.min.best_attr.prob	64.4
dg.min.basin_prob.max	65.5
dg.near.best_attr.prob	72.4
dg.mean.costs_runtime	73.4
dg.min.basin_uncertain.min	76.2
dg.min.basin_prob.median	78.5
dg.mean.basin_prob.median	78.7
dg.near.basin_certain.mean	79.7
dg.near.basin_prob.median	81.4
dg.min.costs_runtime	82.1
dg.near.basin_certain.sum	82.1
dcc.concave.soft	82.3
dg.near.basin_uncertain.min	82.4
dg.near.uncertain	82.9
dcc.concave.hard	83.3
dg.mean.basin_prob.mean	83.7
dg.near.basin_uncertain.max	84.2
dg.mean.basin_uncertain.mean	85.0
dcc.convex.soft	85.6
dg.min.basin_uncertain.mean	86.3
dg.min.uncertain	87.5
dg.near.basin_uncertain.median	88.0
dg.near.basin_certain.median	88.0
dg.min.basin_prob.mean	90.4
dg.mean.basin_uncertain.max	90.8
dg.min.basin_uncertain.median	91.4
dg.mean.basin_uncertain.median	92.3
dg.mean.basin_certain.sum	94.7
dg.mean.uncertain	96.9
dg.min.basin_uncertain.max	96.9
dg.near.basin_certain.min	97.1
dg.mean.tcells	97.6
dg.mean.basin_certain.mean	98.0
dg.min.basin_certain.sum	98.9
dg.mean.basin_uncertain.sum	99.9
dg.mean.basin_certain.median	100.1
dg.min.tcells	100.7
dg.mean.basin_uncertain.min	100.7
dg.min.basin_certain.mean	100.8
dg.min.basin_uncertain.sum	100.8
dg.near.basin_certain.max	100.8
dg.min.basin_certain.max	104.3
dg.near.attractors	104.9
dg.mean.basin_certain.max	104.9
dg.near.pcells	107.4
dcc.convex.hard	107.5
dg.near.tcells	107.6
dg.min.basin_certain.median	108.0
dg.near.basin_uncertain.mean	108.2
dg.near.best_attr.no	110.7
dg.near.basin_prob.mean	110.7
dg.mean.basin_certain.min	110.7
dg.min.attractors	112.3
dg.min.pcells	114.3
dg.min.basin_certain.min	116.1
dg.mean.attractors	120.3
dg.mean.pcells	120.6

Table S.6: Average rankings of the `d_cm_angle` (`dca`), `d_cm_conv` (`dcc`), `d_cm_grad` (`dcg`), and `d_gcm` (`dg`) features in C7-D4 for $n = 640$.

(a) $n = 640$

Feature	Rank
dca.y_ratio_best2worst.sd	43.2
dca.angle.mean	44.7
dcc.costs_runtime	47.1
dcg.mean	50.5
dg.near.costs_runtime	50.8
dca.angle.sd	51.1
dca.dist_ctr2worst.mean	51.4
dca.dist_ctr2best.mean	52.2
dca.y_ratio_best2worst.mean	52.6
dca.dist_ctr2best.sd	52.9
dcg.costs_runtime	54.9
dca.dist_ctr2worst.sd	55.4
dg.min.basin_prob.max	57.6
dg.near.basin_prob.min	62.2
dg.min.basin_prob.min	62.3
dca.costs_runtime	62.9
dg.min.best_attr.prob	63.8
dg.min.basin_prob.median	64.3
dg.mean.basin_prob.min	64.9
dg.near.best_attr.prob	65.7
dg.mean.basin_prob.max	67.8
dg.near.basin_prob.max	69.4
dg.mean.best_attr.prob	70.2
dg.min.basin_prob.mean	74.0
dg.near.basin_uncertain.min	75.1
dg.near.basin_prob.median	75.7
dg.min.basin_uncertain.mean	76.1
dg.min.basin_uncertain.median	79.0
dcc.convex.soft	79.6
dg.min.uncertain	81.1
dg.mean.costs_runtime	81.7
dg.near.basin_certain.mean	83.5
dcc.concave.soft	84.1
dg.mean.basin_prob.median	84.2
dg.min.costs_runtime	85.9
dg.near.basin_uncertain.median	86.3
dg.min.basin_certain.median	86.6
dg.min.basin_certain.mean	87.1
dg.min.basin_uncertain.min	88.1
dg.mean.basin_prob.mean	88.8
dg.near.basin_uncertain.max	89.7
dg.min.basin_uncertain.max	91.0
dg.min.basin_certain.sum	92.3
dg.mean.basin_uncertain.median	92.4
dg.mean.basin_uncertain.mean	93.3
dg.mean.uncertain	94.8
dg.mean.basin_uncertain.max	96.0
dg.min.basin_uncertain.sum	96.4
dg.min.basin_certain.max	96.7
dg.near.uncertain	96.7
dcc.concave.hard	96.9
dg.mean.basin_certain.mean	97.9
dg.min.tcells	98.7
dg.near.basin_certain.sum	99.2
dg.mean.basin_uncertain.sum	99.3
dg.near.attractors	100.9
dg.min.attractors	101.0
dg.mean.basin_uncertain.min	101.2
dg.mean.basin_certain.median	101.7
dg.near.basin_prob.mean	104.0
dg.near.tcells	104.3
dg.near.basin_certain.median	104.7
dg.min.pcells	104.8
dg.near.basin_uncertain.mean	105.0
dg.near.best_attr.no	105.1
dg.near.pcells	105.5
dg.mean.basin_certain.sum	106.2
dg.min.basin_certain.min	106.7
dg.near.basin_certain.max	106.9
dg.mean.tcells	109.3
dg.mean.basin_certain.max	109.4
dcc.convex.hard	111.6
dg.near.basin_certain.min	113.0
dg.mean.basin_certain.min	114.1
dg.mean.pcells	118.1
dg.mean.attractors	118.8

Table S.7: Average accuracy of C7-D2 with different m for $n \in \{3, 5, 10, 20, 40, 80, 160, 320, 640\}$.

(a) Multimodality

	$m = 1$	$m = 2$	$m = 3$	$m = 5$	$m = 10$
5	0.611 (0.422)	0.622 (0.415)	0.650 (0.432)	Na	Na
10	0.583 (0.439)	0.647 (0.434)	0.628 (0.425)	0.572 (0.415)	Na
20	0.617 (0.415)	0.639 (0.413)	0.653 (0.425)	0.647 (0.433)	0.631 (0.430)
40	0.603 (0.448)	0.617 (0.441)	0.589 (0.434)	0.589 (0.438)	0.600 (0.429)
80	0.625 (0.455)	0.622 (0.454)	0.625 (0.451)	0.631 (0.459)	0.631 (0.444)
160	0.544 (0.477)	0.561 (0.475)	0.556 (0.477)	0.592 (0.472)	0.547 (0.474)
320	0.575 (0.482)	0.578 (0.472)	0.586 (0.471)	0.592 (0.472)	0.572 (0.474)
640	0.586 (0.478)	0.583 (0.489)	0.581 (0.488)	0.583 (0.488)	0.575 (0.483)

(b) Global structure

	$m = 1$	$m = 2$	$m = 3$	$m = 5$	$m = 10$
5	0.769 (0.395)	0.761 (0.412)	0.764 (0.402)	Na	Na
10	0.700 (0.437)	0.692 (0.435)	0.703 (0.435)	0.686 (0.451)	Na
20	0.717 (0.421)	0.697 (0.440)	0.714 (0.425)	0.717 (0.429)	0.728 (0.421)
40	0.711 (0.460)	0.711 (0.460)	0.714 (0.456)	0.714 (0.456)	0.711 (0.460)
80	0.694 (0.452)	0.697 (0.453)	0.697 (0.453)	0.694 (0.453)	0.697 (0.453)
160	0.622 (0.471)	0.631 (0.463)	0.633 (0.462)	0.628 (0.469)	0.628 (0.469)
320	0.664 (0.480)	0.667 (0.482)	0.664 (0.480)	0.664 (0.480)	0.661 (0.478)
640	0.672 (0.474)	0.678 (0.468)	0.675 (0.471)	0.675 (0.471)	0.675 (0.471)

(c) Separability

	$m = 1$	$m = 2$	$m = 3$	$m = 5$	$m = 10$
5	0.783 (0.374)	0.761 (0.421)	0.764 (0.400)	Na	Na
10	0.761 (0.408)	0.753 (0.411)	0.750 (0.415)	0.758 (0.408)	Na
20	0.736 (0.402)	0.744 (0.401)	0.750 (0.403)	0.728 (0.425)	0.717 (0.433)
40	0.758 (0.400)	0.758 (0.401)	0.758 (0.398)	0.756 (0.399)	0.750 (0.404)
80	0.681 (0.454)	0.686 (0.447)	0.683 (0.455)	0.683 (0.452)	0.689 (0.449)
160	0.669 (0.472)	0.667 (0.476)	0.672 (0.468)	0.667 (0.476)	0.669 (0.472)
320	0.672 (0.474)	0.669 (0.467)	0.669 (0.472)	0.661 (0.472)	0.672 (0.468)
640	0.694 (0.419)	0.669 (0.453)	0.658 (0.460)	0.775 (0.390)	0.781 (0.400)

(d) Variable scaling

	$m = 1$	$m = 2$	$m = 3$	$m = 5$	$m = 10$
5	0.586 (0.475)	0.594 (0.480)	0.592 (0.478)	Na	Na
10	0.564 (0.492)	0.572 (0.496)	0.556 (0.490)	0.528 (0.494)	Na
20	0.578 (0.499)	0.583 (0.504)	0.583 (0.504)	0.575 (0.498)	0.542 (0.509)
40	0.542 (0.499)	0.556 (0.492)	0.550 (0.494)	0.550 (0.494)	0.544 (0.497)
80	0.539 (0.507)	0.581 (0.501)	0.583 (0.504)	0.567 (0.496)	0.583 (0.504)
160	0.567 (0.496)	0.583 (0.504)	0.583 (0.504)	0.583 (0.504)	0.583 (0.504)
320	0.547 (0.495)	0.583 (0.504)	0.583 (0.504)	0.583 (0.504)	0.583 (0.504)
640	0.542 (0.509)	0.542 (0.509)	0.542 (0.509)	0.542 (0.509)	0.569 (0.496)

(e) Homogeneity

	$m = 1$	$m = 2$	$m = 3$	$m = 5$	$m = 10$
5	0.669 (0.418)	0.647 (0.408)	0.664 (0.410)	Na	Na
10	0.767 (0.341)	0.769 (0.338)	0.758 (0.345)	0.758 (0.350)	Na
20	0.775 (0.376)	0.731 (0.403)	0.731 (0.396)	0.717 (0.424)	0.736 (0.402)
40	0.811 (0.325)	0.744 (0.407)	0.744 (0.413)	0.739 (0.412)	0.731 (0.414)
80	0.717 (0.431)	0.742 (0.412)	0.717 (0.419)	0.678 (0.448)	0.675 (0.452)
160	0.678 (0.444)	0.683 (0.439)	0.669 (0.456)	0.675 (0.459)	0.656 (0.454)
320	0.742 (0.438)	0.761 (0.417)	0.747 (0.441)	0.747 (0.441)	0.739 (0.438)
640	0.789 (0.414)	0.781 (0.411)	0.742 (0.423)	0.739 (0.438)	0.781 (0.410)

(f) Basin size

	$m = 1$	$m = 2$	$m = 3$	$m = 5$	$m = 10$
5	0.525 (0.386)	0.522 (0.373)	0.517 (0.375)	Na	Na
10	0.603 (0.376)	0.636 (0.384)	0.642 (0.365)	0.581 (0.372)	Na
20	0.536 (0.404)	0.558 (0.409)	0.569 (0.403)	0.581 (0.405)	0.533 (0.421)
40	0.586 (0.431)	0.614 (0.423)	0.608 (0.421)	0.619 (0.409)	0.608 (0.424)
80	0.594 (0.466)	0.597 (0.460)	0.600 (0.465)	0.583 (0.471)	0.583 (0.467)
160	0.611 (0.456)	0.614 (0.447)	0.617 (0.448)	0.628 (0.444)	0.619 (0.439)
320	0.497 (0.461)	0.508 (0.446)	0.528 (0.452)	0.511 (0.454)	0.500 (0.456)
640	0.511 (0.468)	0.528 (0.471)	0.511 (0.467)	0.522 (0.474)	0.517 (0.474)

(g) GL contrast

	$m = 1$	$m = 2$	$m = 3$	$m = 5$	$m = 10$
5	0.536 (0.414)	0.536 (0.411)	0.522 (0.426)	Na	Na
10	0.600 (0.413)	0.619 (0.410)	0.619 (0.405)	0.617 (0.404)	Na
20	0.628 (0.383)	0.617 (0.384)	0.636 (0.394)	0.600 (0.407)	0.619 (0.408)
40	0.583 (0.430)	0.597 (0.428)	0.578 (0.433)	0.594 (0.436)	0.589 (0.439)
80	0.622 (0.459)	0.619 (0.458)	0.617 (0.460)	0.606 (0.457)	0.592 (0.447)
160	0.631 (0.446)	0.622 (0.445)	0.608 (0.435)	0.608 (0.442)	0.600 (0.444)
320	0.653 (0.459)	0.647 (0.436)	0.628 (0.428)	0.639 (0.440)	0.639 (0.440)
640	0.589 (0.492)	0.614 (0.473)	0.633 (0.473)	0.631 (0.482)	0.594 (0.481)

(h) Overall average

	$m = 1$	$m = 2$	$m = 3$	$m = 5$	$m = 10$
5	0.640 (0.417)	0.635 (0.420)	0.639 (0.422)	Na	Na
10	0.654 (0.418)	0.670 (0.415)	0.665 (0.412)	0.643 (0.417)	Na
20	0.655 (0.417)	0.653 (0.421)	0.662 (0.420)	0.652 (0.429)	0.644 (0.433)
40	0.656 (0.434)	0.657 (0.436)	0.649 (0.436)	0.652 (0.435)	0.648 (0.438)
80	0.639 (0.456)	0.649 (0.451)	0.646 (0.453)	0.635 (0.457)	0.636 (0.454)
160	0.617 (0.460)	0.623 (0.458)	0.620 (0.458)	0.626 (0.460)	0.615 (0.459)
320	0.621 (0.468)	0.631 (0.459)	0.629 (0.461)	0.628 (0.463)	0.624 (0.463)
640	0.626 (0.466)	0.628 (0.467)	0.620 (0.468)	0.638 (0.466)	0.642 (0.463)

Table S.8: Average accuracy of C7-D4 with different m for $n \in \{5, 10, 20, 40, 80, 160, 320, 640\}$.

(a) Multimodality

	$m = 2$	$m = 3$	$m = 5$
5	0.522 (0.423)	0.550 (0.436)	Na
10	0.561 (0.414)	0.558 (0.425)	0.544 (0.419)
20	0.550 (0.436)	0.525 (0.434)	0.536 (0.419)
40	0.564 (0.449)	0.567 (0.456)	0.575 (0.450)
80	0.544 (0.436)	0.567 (0.442)	0.578 (0.440)
160	0.528 (0.445)	0.533 (0.450)	0.547 (0.439)
320	0.542 (0.472)	0.553 (0.474)	0.542 (0.473)
640	0.536 (0.466)	0.528 (0.462)	0.506 (0.468)

(b) Global structure

	$m = 2$	$m = 3$	$m = 5$
5	0.778 (0.400)	0.772 (0.408)	Na
10	0.719 (0.426)	0.728 (0.412)	0.728 (0.424)
20	0.733 (0.416)	0.733 (0.412)	0.733 (0.413)
40	0.714 (0.456)	0.717 (0.448)	0.722 (0.447)
80	0.706 (0.440)	0.708 (0.441)	0.714 (0.437)
160	0.656 (0.453)	0.661 (0.453)	0.667 (0.448)
320	0.664 (0.474)	0.661 (0.478)	0.669 (0.478)
640	0.683 (0.461)	0.683 (0.461)	0.678 (0.464)

(c) Separability

	$m = 2$	$m = 3$	$m = 5$
5	0.761 (0.409)	0.769 (0.417)	Na
10	0.758 (0.414)	0.767 (0.413)	0.772 (0.413)
20	0.731 (0.410)	0.739 (0.408)	0.722 (0.414)
40	0.775 (0.402)	0.778 (0.399)	0.769 (0.395)
80	0.719 (0.425)	0.722 (0.423)	0.711 (0.431)
160	0.708 (0.440)	0.719 (0.436)	0.725 (0.436)
320	0.731 (0.433)	0.733 (0.431)	0.725 (0.432)
640	0.744 (0.413)	0.739 (0.419)	0.753 (0.412)

(d) Variable scaling

	$m = 2$	$m = 3$	$m = 5$
5	0.636 (0.469)	0.633 (0.464)	Na
10	0.528 (0.486)	0.536 (0.482)	0.542 (0.478)
20	0.536 (0.504)	0.531 (0.501)	0.539 (0.507)
40	0.533 (0.490)	0.550 (0.497)	0.553 (0.496)
80	0.581 (0.501)	0.583 (0.504)	0.581 (0.501)
160	0.583 (0.504)	0.583 (0.504)	0.583 (0.504)
320	0.544 (0.506)	0.547 (0.504)	0.558 (0.497)
640	0.542 (0.509)	0.542 (0.509)	0.542 (0.509)

(e) Homogeneity

	$m = 2$	$m = 3$	$m = 5$
5	0.636 (0.412)	0.636 (0.421)	Na
10	0.706 (0.395)	0.697 (0.397)	0.694 (0.410)
20	0.769 (0.367)	0.775 (0.359)	0.764 (0.360)
40	0.781 (0.368)	0.786 (0.361)	0.789 (0.356)
80	0.706 (0.434)	0.733 (0.414)	0.742 (0.418)
160	0.656 (0.465)	0.667 (0.449)	0.678 (0.444)
320	0.772 (0.408)	0.778 (0.410)	0.761 (0.410)
640	0.758 (0.424)	0.758 (0.424)	0.747 (0.435)

(f) Basin size

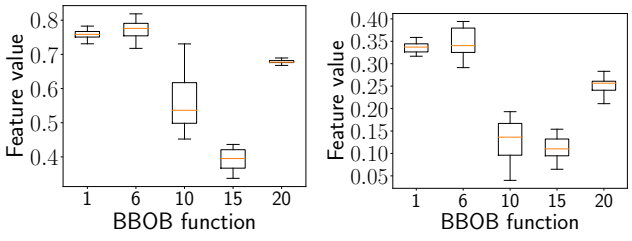
	$m = 2$	$m = 3$	$m = 5$
5	0.478 (0.403)	0.489 (0.403)	Na
10	0.531 (0.388)	0.506 (0.401)	0.508 (0.403)
20	0.483 (0.425)	0.481 (0.432)	0.497 (0.437)
40	0.533 (0.440)	0.528 (0.441)	0.525 (0.444)
80	0.519 (0.448)	0.528 (0.457)	0.508 (0.471)
160	0.472 (0.459)	0.475 (0.454)	0.483 (0.457)
320	0.400 (0.478)	0.403 (0.476)	0.406 (0.476)
640	0.492 (0.475)	0.483 (0.479)	0.492 (0.477)

(g) GL contrast

	$m = 2$	$m = 3$	$m = 5$
5	0.503 (0.407)	0.508 (0.408)	Na
10	0.592 (0.419)	0.569 (0.398)	0.561 (0.409)
20	0.558 (0.410)	0.544 (0.410)	0.542 (0.412)
40	0.522 (0.417)	0.508 (0.416)	0.508 (0.417)
80	0.553 (0.446)	0.567 (0.444)	0.558 (0.443)
160	0.547 (0.440)	0.536 (0.443)	0.547 (0.444)
320	0.550 (0.473)	0.558 (0.474)	0.550 (0.478)
640	0.544 (0.486)	0.561 (0.480)	0.561 (0.478)

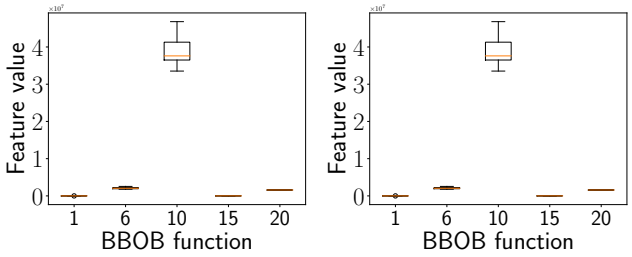
(h) Overall average

	$m = 2$	$m = 3$	$m = 5$
5	0.616 (0.426)	0.623 (0.429)	Na
10	0.628 (0.423)	0.623 (0.423)	0.621 (0.427)
20	0.623 (0.432)	0.618 (0.432)	0.619 (0.431)
40	0.632 (0.440)	0.633 (0.440)	0.635 (0.438)
80	0.618 (0.447)	0.630 (0.447)	0.627 (0.450)
160	0.593 (0.457)	0.596 (0.455)	0.604 (0.453)
320	0.600 (0.471)	0.605 (0.471)	0.602 (0.470)
640	0.614 (0.466)	0.613 (0.466)	0.611 (0.467)



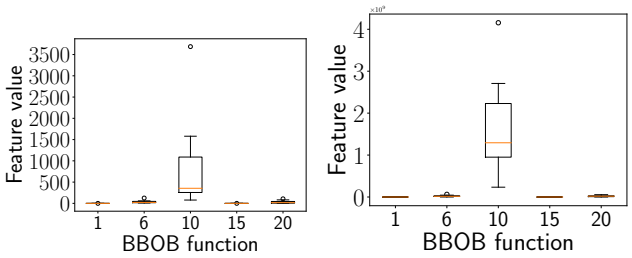
(a) `ela_meta.lin_simple.adj_r2` (b) `d_ela_meta.lin_simple.adj_r2`

Figure S.5: Boxplots of values of `ela_meta.lin_simple.adj_r2` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 160$.



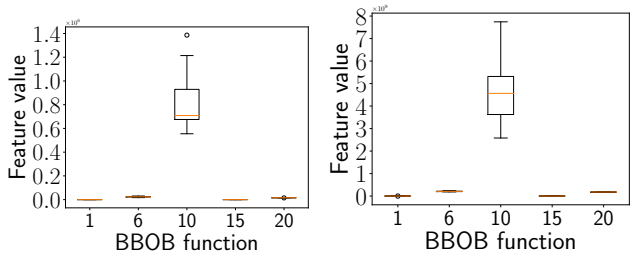
(a) `ela_meta.lin_simple.intercept` (b) `d_ela_meta.lin_simple.intercept`

Figure S.6: Boxplots of values of `ela_meta.lin_simple.intercept` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 160$.



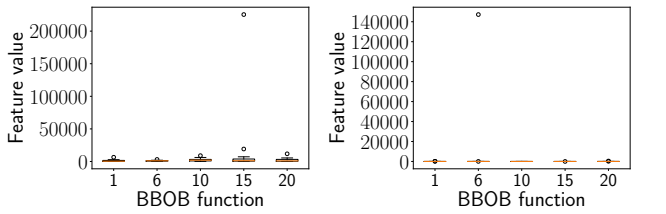
(a) `ela_meta.lin_simple.coef.min` (b) `d_ela_meta.lin_simple.coef.min`

Figure S.7: Boxplots of values of `ela_meta.lin_simple.coef.min` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 160$.



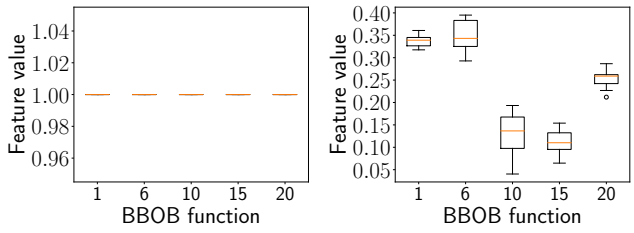
(a) `ela_meta.lin_simple.coef.max` (b) `d_ela_meta.lin_simple.coef.max`

Figure S.8: Boxplots of values of `ela_meta.lin_simple.coef.max` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 160$.



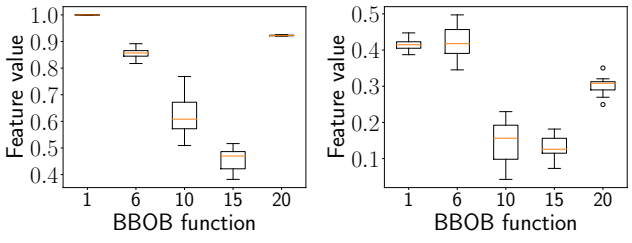
(a) `ela_meta.lin_simple.coef.max_by_min` (b) `d_ela_meta.lin_simple.coef.max_by_min`

Figure S.9: Boxplots of values of `ela_meta.lin_simple.coef.max_by_min` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 160$.



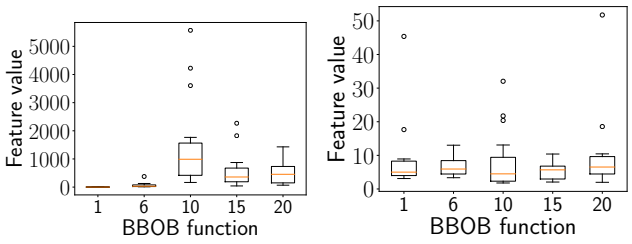
(a) `ela_meta.lin_w_interact.adj_r2` (b) `d_ela_meta.lin_w_interact.adj_r2`

Figure S.10: Boxplots of values of `ela_meta.lin_w_interact.adj_r2` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 160$.



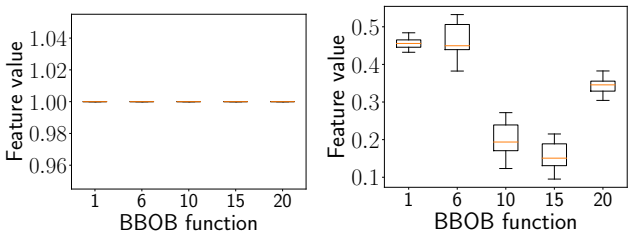
(a) `ela_meta.quad_simple.adj_r2` (b) `d_ela_meta.quad_simple.adj_r2`

Figure S.11: Boxplots of values of `ela_meta.quad_simple.adj_r2` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 160$.



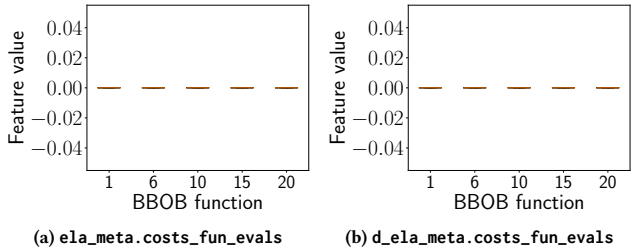
(a) `ela_meta.quad_simple.cond` (b) `d_ela_meta.quad_simple.cond`

Figure S.12: Boxplots of values of `ela_meta.quad_simple.cond` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 160$.



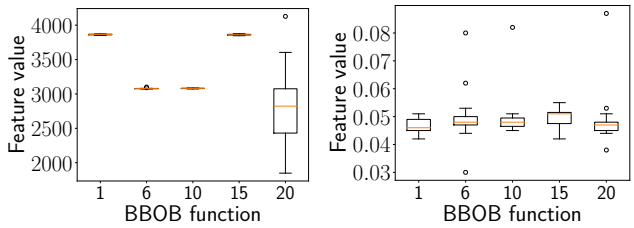
(a) `ela_meta.quad_w_interact.adj_r2` (b) `d_ela_meta.quad_w_interact.adj_r2`

Figure S.13: Boxplots of values of `ela_meta.quad_w_interact.adj_r2` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 160$.



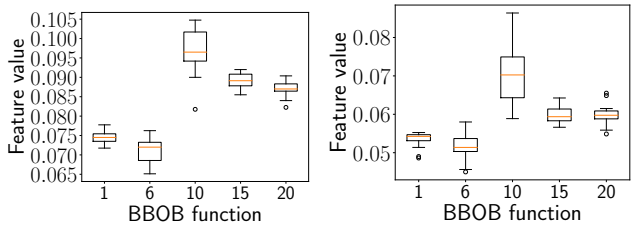
(a) `ela_meta.costs_fun_evals` (b) `d_ela_meta.costs_fun_evals`

Figure S.14: Boxplots of values of `ela_meta.costs_fun_evals` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 160$.



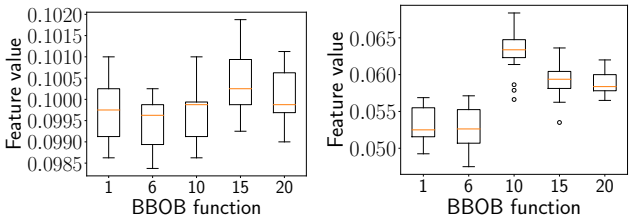
(a) `ela_meta.costs_runtime` (b) `d_ela_meta.costs_runtime`

Figure S.15: Boxplots of values of `ela_meta.costs_runtime` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 160$.



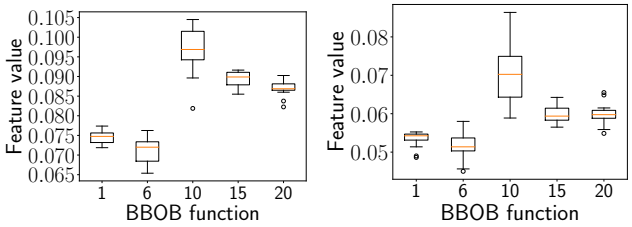
(a) `ela_level.mmce_lda_10` (b) `d_ela_level.mmce_lda_10`

Figure S.16: Boxplots of values of `ela_level.mmce_lda_10` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 160$.



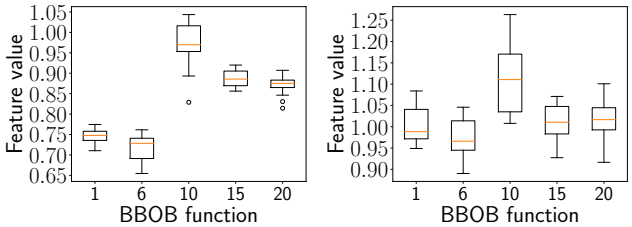
(a) `ela_level.mmce_qda_10` (b) `d_ela_level.mmce_qda_10`

Figure S.17: Boxplots of values of `ela_level.mmce_qda_10` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 160$.



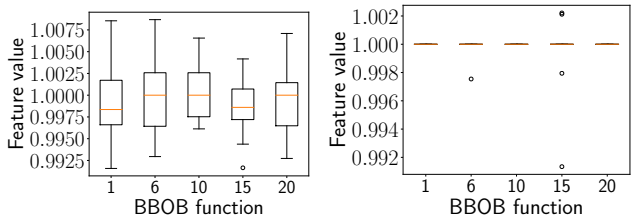
(a) `ela_level.mmce_mda_10` (b) `d_ela_level.mmce_mda_10`

Figure S.18: Boxplots of values of `ela_level.mmce_mda_10` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 160$.



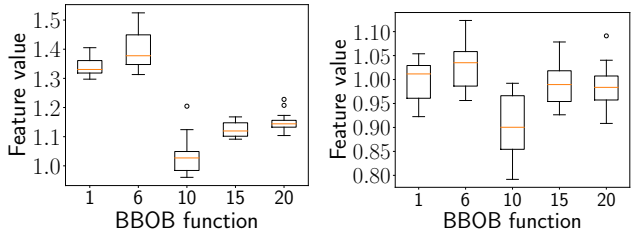
(a) `ela_level.lda_qda_10` (b) `d_ela_level.lda_qda_10`

Figure S.19: Boxplots of values of `ela_level.lda_qda_10` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 160$.



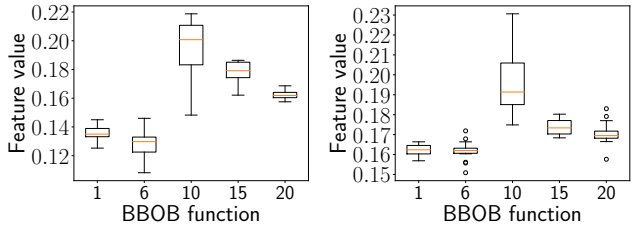
(a) `ela_level.lda_mda_10` (b) `d_ela_level.lda_mda_10`

Figure S.20: Boxplots of values of `ela_level.lda_mda_10` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 160$.



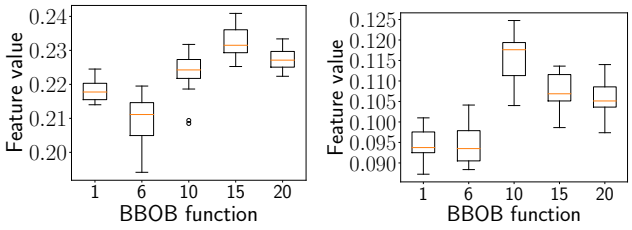
(a) `ela_level.qda_mda_10` (b) `d_ela_level.qda_mda_10`

Figure S.21: Boxplots of values of `ela_level.qda_mda_10` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 160$.



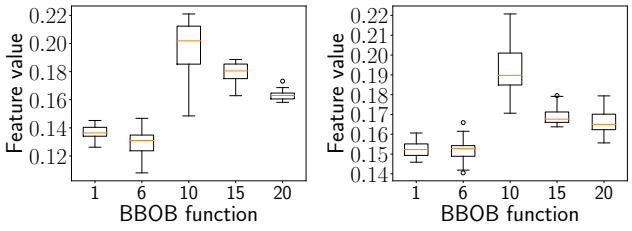
(a) `ela_level.mmce_lda_25` (b) `d_ela_level.mmce_lda_25`

Figure S.22: Boxplots of values of `ela_level.mmce_lda_25` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 160$.



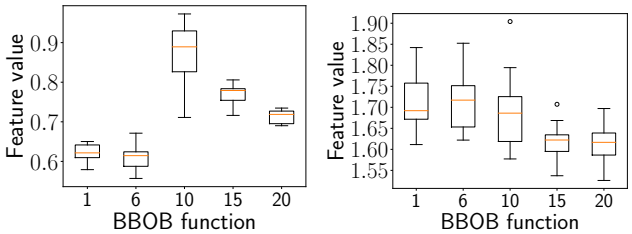
(a) `ela_level.mmce_qda_25` (b) `d_ela_level.mmce_qda_25`

Figure S.23: Boxplots of values of `ela_level.mmce_qda_25` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 160$.



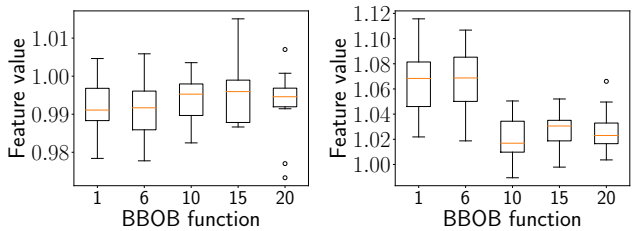
(a) `ela_level.mmce_mda_25` (b) `d_ela_level.mmce_mda_25`

Figure S.24: Boxplots of values of `ela_level.mmce_mda_25` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 160$.



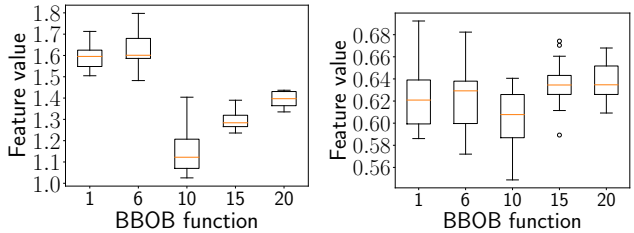
(a) `ela_level.lda_qda_25` (b) `d_ela_level.lda_qda_25`

Figure S.25: Boxplots of values of `ela_level.lda_qda_25` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 160$.



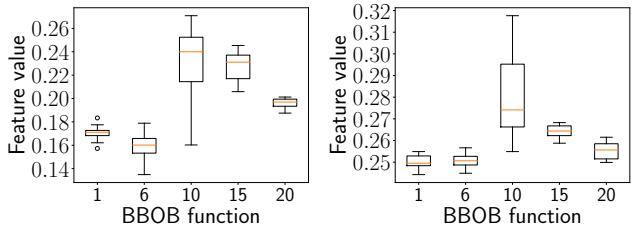
(a) `ela_level.lda_mda_25` (b) `d_ela_level.lda_mda_25`

Figure S.26: Boxplots of values of `ela_level.lda_mda_25` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 160$.



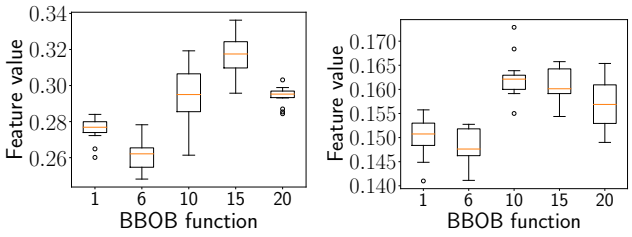
(a) `ela_level.qda_mda_25` (b) `d_ela_level.qda_mda_25`

Figure S.27: Boxplots of values of `ela_level.qda_mda_25` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 160$.



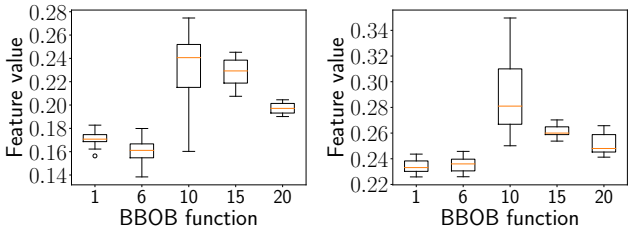
(a) `ela_level.mmce_lda_50` (b) `d_ela_level.mmce_lda_50`

Figure S.28: Boxplots of values of `ela_level.mmce_lda_50` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 160$.



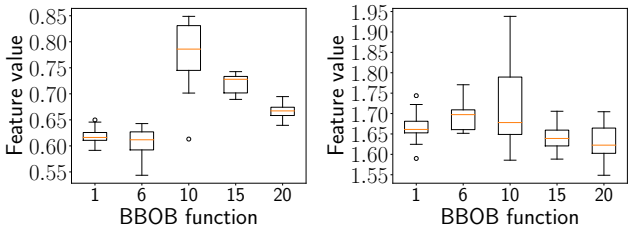
(a) `ela_level.mmce_qda_50` (b) `d_ela_level.mmce_qda_50`

Figure S.29: Boxplots of values of `ela_level.mmce_qda_50` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 160$.



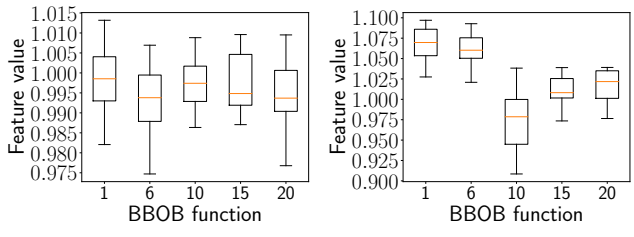
(a) `ela_level.mmce_mda_50` (b) `d_ela_level.mmce_mda_50`

Figure S.30: Boxplots of values of `ela_level.mmce_mda_50` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 160$.



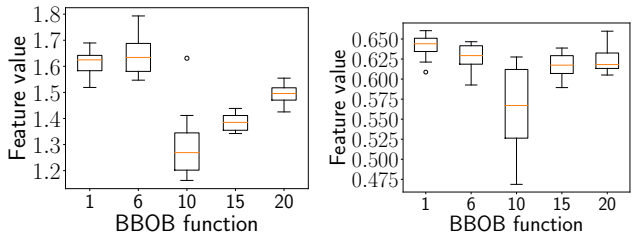
(a) `ela_level.lda_qda_50` (b) `d_ela_level.lda_qda_50`

Figure S.31: Boxplots of values of `ela_level.lda_qda_50` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 160$.



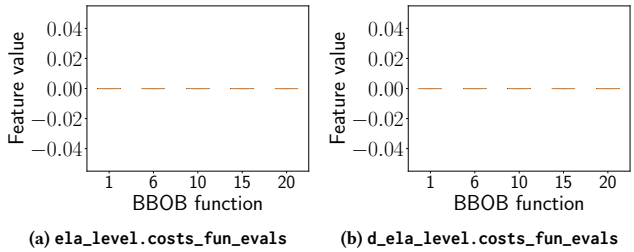
(a) `ela_level.lda_mda_50` (b) `d_ela_level.lda_mda_50`

Figure S.32: Boxplots of values of `ela_level.lda_mda_50` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 160$.



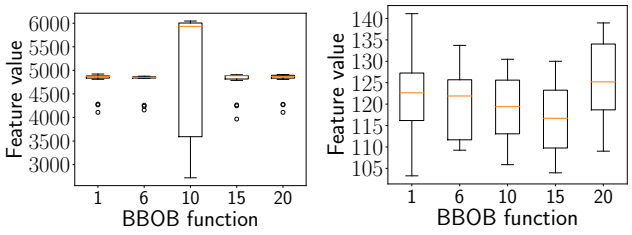
(a) `ela_level.qda_mda_50` (b) `d_ela_level.qda_mda_50`

Figure S.33: Boxplots of values of `ela_level.qda_mda_50` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 160$.



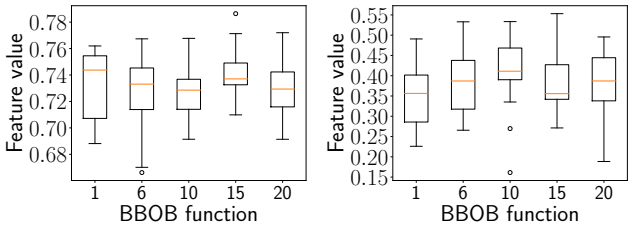
(a) `ela_level.costs_fun_evals` (b) `d_ela_level.costs_fun_evals`

Figure S.34: Boxplots of values of `ela_level.costs_fun_evals` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 160$.



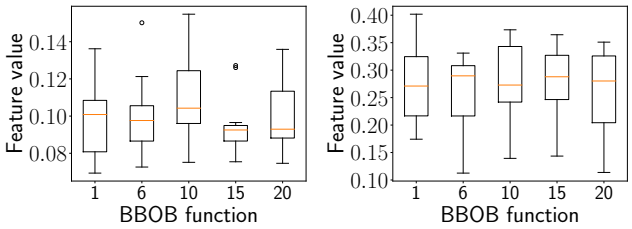
(a) `ela_level.costs_runtime` (b) `d_ela_level.costs_runtime`

Figure S.35: Boxplots of values of `ela_level.costs_runtime` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 160$.



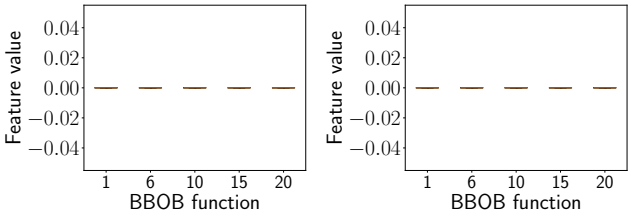
(a) `cm_grad.mean` (b) `d_cm_grad.mean`

Figure S.36: Boxplots of values of `cm_grad.mean` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 5$.



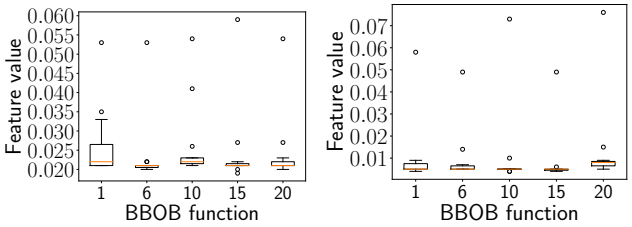
(a) `cm_grad.sd` (b) `d_cm_grad.sd`

Figure S.37: Boxplots of values of `cm_grad.sd` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 5$.



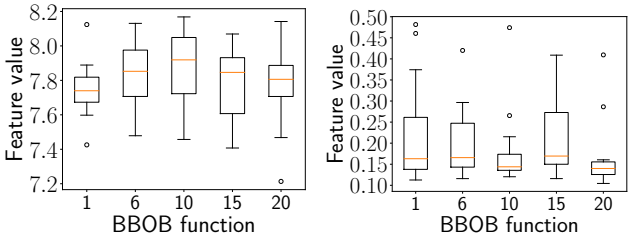
(a) `cm_grad.costs_fun_evals` (b) `d_cm_grad.costs_fun_evals`

Figure S.38: Boxplots of values of `cm_grad.costs_fun_evals` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 5$.



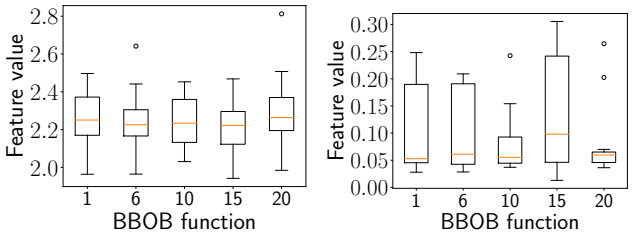
(a) `cm_grad.costs_runtime` (b) `d_cm_grad.costs_runtime`

Figure S.39: Boxplots of values of `cm_grad.costs_runtime` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 5$.



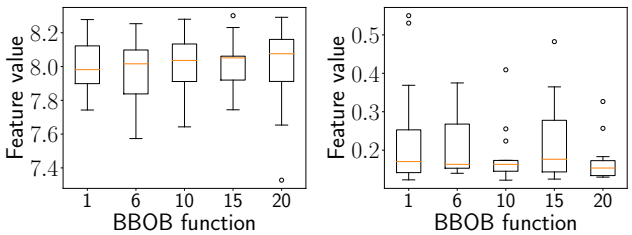
(a) `cm_angle.dist_ctr2best.mean` (b) `d_cm_angle.dist_ctr2best.mean`

Figure S.40: Boxplots of values of `cm_angle.dist_ctr2best.mean` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 5$.



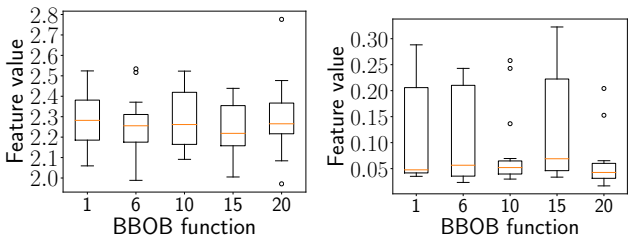
(a) `cm_angle.dist_ctr2best.sd` (b) `d_cm_angle.dist_ctr2best.sd`

Figure S.41: Boxplots of values of `cm_angle.dist_ctr2best.sd` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 5$.



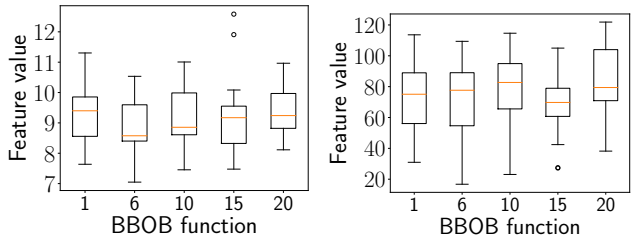
(a) `cm_angle.dist_ctr2worst.mean` (b) `d_cm_angle.dist_ctr2worst.mean`

Figure S.42: Boxplots of values of `cm_angle.dist_ctr2worst.mean` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 5$.



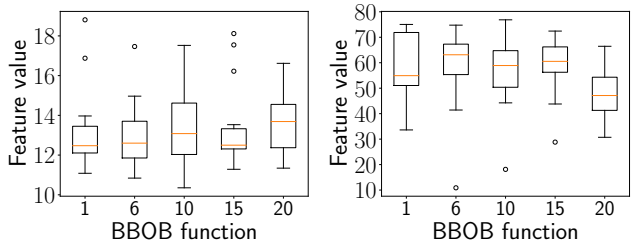
(a) `cm_angle.dist_ctr2worst.sd` (b) `d_cm_angle.dist_ctr2worst.sd`

Figure S.43: Boxplots of values of `cm_angle.dist_ctr2worst.sd` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 5$.



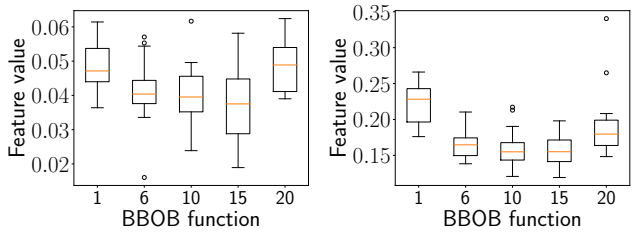
(a) `cm_angle.angle.mean` (b) `d_cm_angle.angle.mean`

Figure S.44: Boxplots of values of `cm_angle.angle.mean` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 5$.



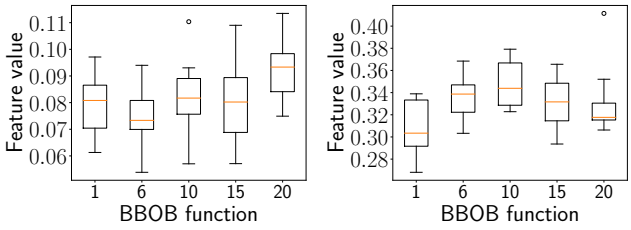
(a) `cm_angle.angle.sd` (b) `d_cm_angle.angle.sd`

Figure S.45: Boxplots of values of `cm_angle.angle.sd` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 5$.



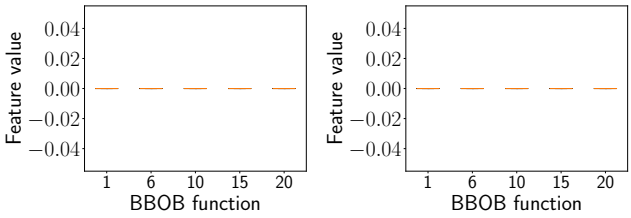
(a) `cm_angle.y_ratio_best2worst.mean` (b) `d_cm_angle.y_ratio_best2worst.mean`

Figure S.46: Boxplots of values of `cm_angle.y_ratio_best2worst.mean` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 5$.



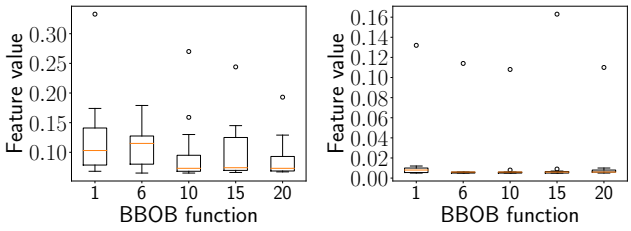
(a) `cm_angle.y_ratio_best2worst.sd` (b) `d_cm_angle.y_ratio_best2worst.sd`

Figure S.47: Boxplots of values of `cm_angle.y_ratio_best2worst.sd` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 5$.



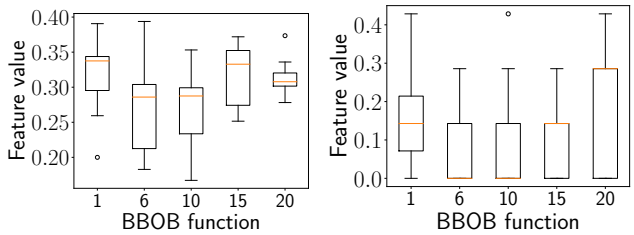
(a) `cm_angle.costs_fun_evals` (b) `d_cm_angle.costs_fun_evals`

Figure S.48: Boxplots of values of `cm_angle.costs_fun_evals` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 5$.



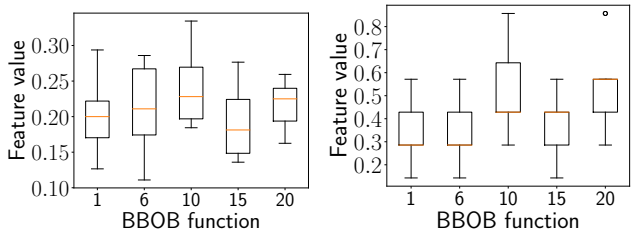
(a) `cm_angle.costs_runtime` (b) `d_cm_angle.costs_runtime`

Figure S.49: Boxplots of values of `cm_angle.costs_runtime` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 5$.



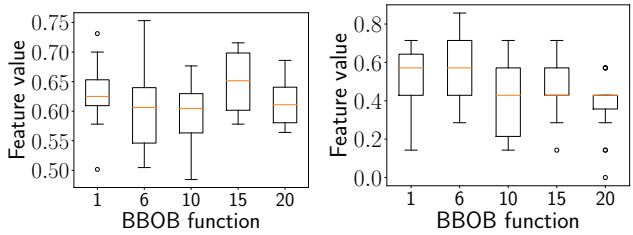
(a) `cm_conv.convex.hard` (b) `d_cm_conv.convex.hard`

Figure S.50: Boxplots of values of `cm_conv.convex.hard` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 5$.



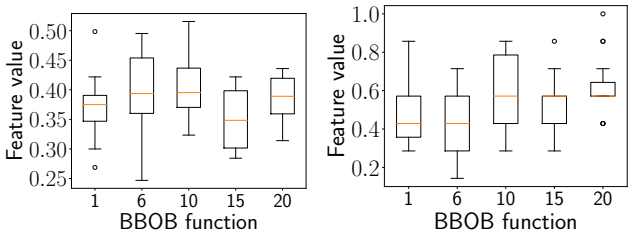
(a) `cm_conv.concave.hard` (b) `d_cm_conv.concave.hard`

Figure S.51: Boxplots of values of `cm_conv.concave.hard` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 5$.



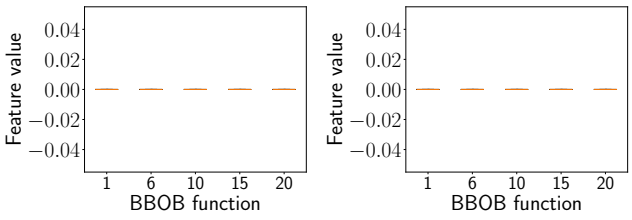
(a) `cm_conv.convex.soft` (b) `d_cm_conv.convex.soft`

Figure S.52: Boxplots of values of `cm_conv.convex.soft` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 5$.



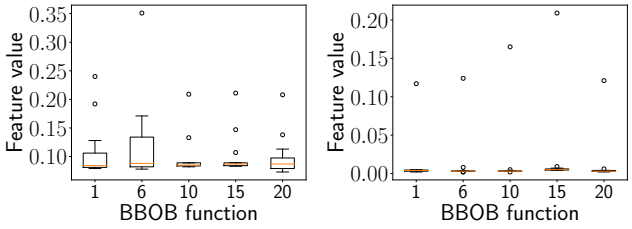
(a) `cm_conv.concave.soft` (b) `d_cm_conv.concave.soft`

Figure S.53: Boxplots of values of `cm_conv.concave.soft` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 5$.



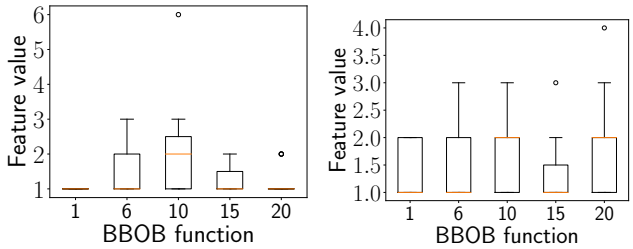
(a) `cm_conv.costs_fun_evals` (b) `d_cm_conv.costs_fun_evals`

Figure S.54: Boxplots of values of `cm_conv.costs_fun_evals` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 5$.



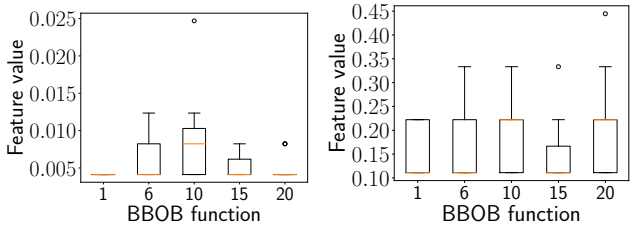
(a) `cm_conv.costs_runtime` (b) `d_cm_conv.costs_runtime`

Figure S.55: Boxplots of values of `cm_conv.costs_runtime` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 5$.



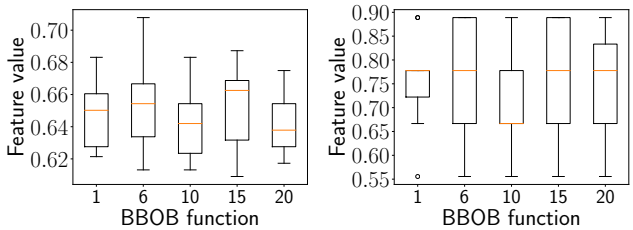
(a) `gcm.min.attractors` (b) `d_gcm.min.attractors`

Figure S.56: Boxplots of values of `gcm.min.attractors` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 5$.



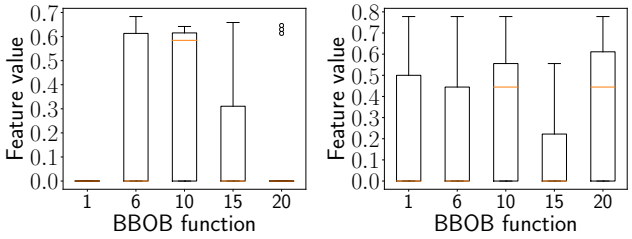
(a) `gcm.min.pcells` (b) `d_gcm.min.pcells`

Figure S.57: Boxplots of values of `gcm.min.pcells` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 5$.



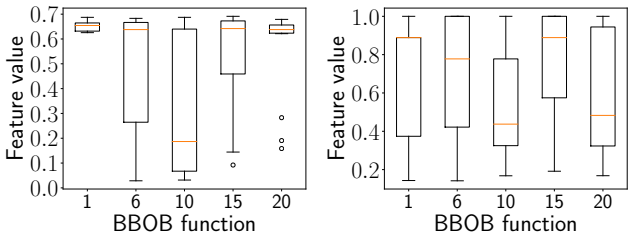
(a) `gcm.min.tcells` (b) `d_gcm.min.tcells`

Figure S.58: Boxplots of values of `gcm.min.tcells` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 5$.



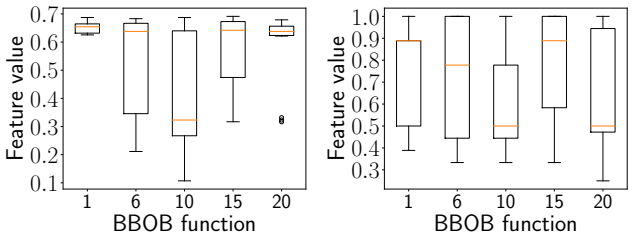
(a) gcm.min.uncertain (b) d_gcm.min.uncertain

Figure S.59: Boxplots of values of `gcm.min.uncertain` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 5$.



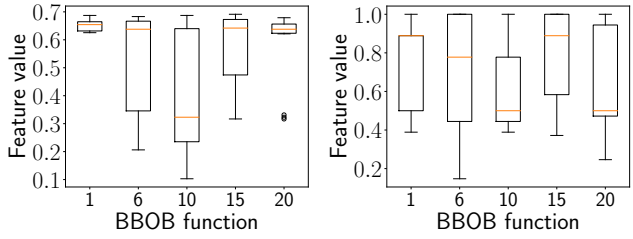
(a) gcm.min.basin_prob.min (b) d_gcm.min.basin_prob.min

Figure S.60: Boxplots of values of `gcm.min.basin_prob.min` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 5$.



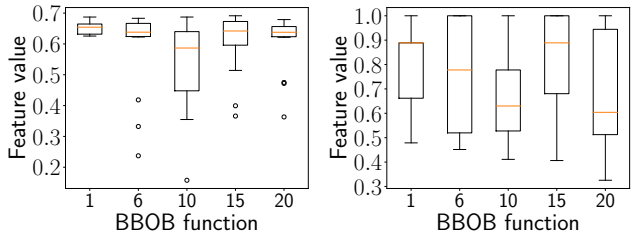
(a) gcm.min.basin_prob.mean (b) d_gcm.min.basin_prob.mean

Figure S.61: Boxplots of values of `gcm.min.basin_prob.mean` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 5$.



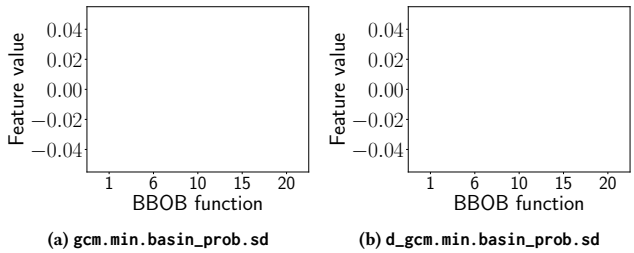
(a) gcm.min.basin_prob.median (b) d_gcm.min.basin_prob.median

Figure S.62: Boxplots of values of `gcm.min.basin_prob.median` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 5$.



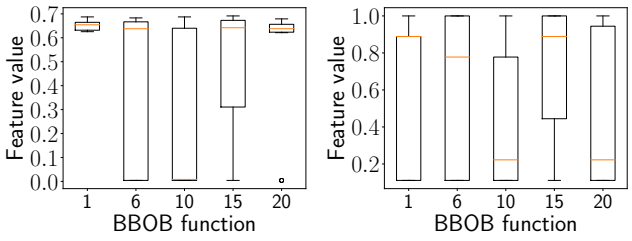
(a) gcm.min.basin_prob.max (b) d_gcm.min.basin_prob.max

Figure S.63: Boxplots of values of `gcm.min.basin_prob.max` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 5$.



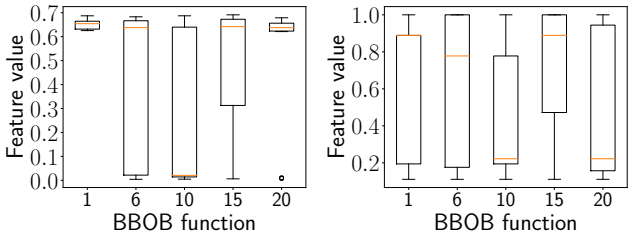
(a) gcm.min.basin_prob.sd (b) d_gcm.min.basin_prob.sd

Figure S.64: Boxplots of values of `gcm.min.basin_prob.sd` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 5$.



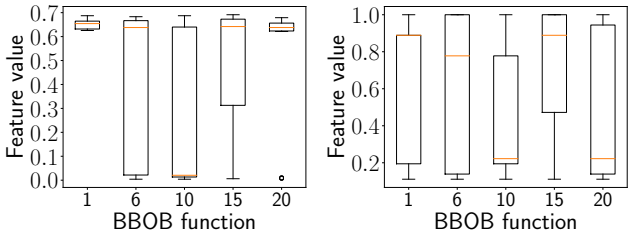
(a) `gcm.min.basin_certain.min` (b) `d_gcm.min.basin_certain.min`

Figure S.65: Boxplots of values of `gcm.min.basin_certain.min` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 5$.



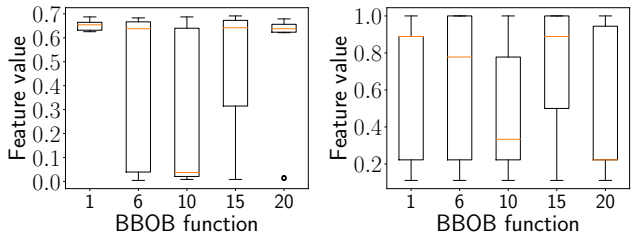
(a) `gcm.min.basin_certain.mean` (b) `d_gcm.min.basin_certain.mean`

Figure S.66: Boxplots of values of `gcm.min.basin_certain.mean` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 5$.



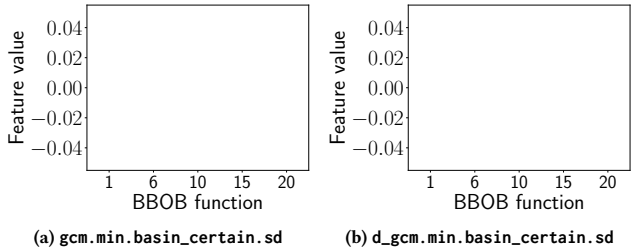
(a) `gcm.min.basin_certain.median` (b) `d_gcm.min.basin_certain.median`

Figure S.67: Boxplots of values of `gcm.min.basin_certain.median` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 5$.



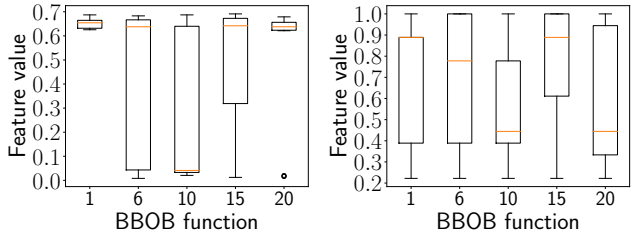
(a) `gcm.min.basin_certain.max` (b) `d_gcm.min.basin_certain.max`

Figure S.68: Boxplots of values of `gcm.min.basin_certain.max` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 5$.



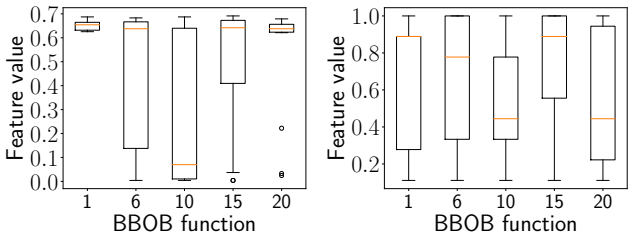
(a) `gcm.min.basin_certain.sd` (b) `d_gcm.min.basin_certain.sd`

Figure S.69: Boxplots of values of `gcm.min.basin_certain.sd` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 5$.



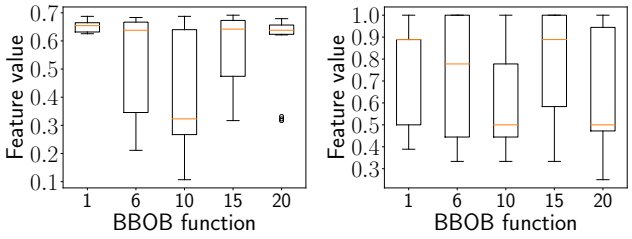
(a) `gcm.min.basin_certain.sum` (b) `d_gcm.min.basin_certain.sum`

Figure S.70: Boxplots of values of `gcm.min.basin_certain.sum` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 5$.



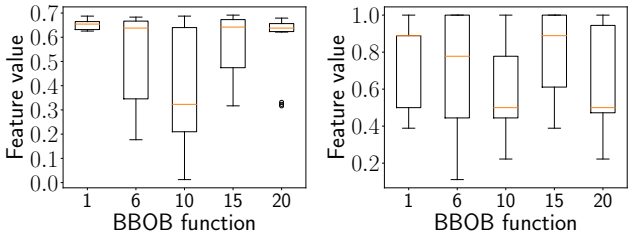
(a) `gcm.min.basin_uncertain.min` (b) `d_gcm.min.basin_uncertain.min`

Figure S.71: Boxplots of values of `gcm.min.basin_uncertain.min` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 5$.



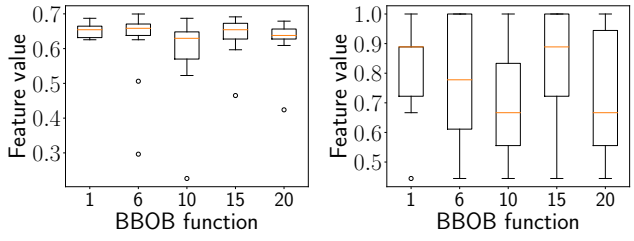
(a) `gcm.min.basin_uncertain.mean` (b) `d_gcm.min.basin_uncertain.mean`

Figure S.72: Boxplots of values of `gcm.min.basin_uncertain.mean` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 5$.



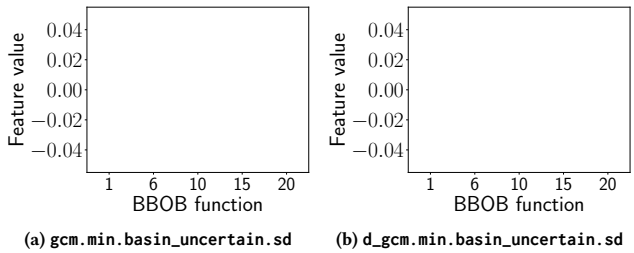
(a) `gcm.min.basin_uncertain.median` (b) `d_gcm.min.basin_uncertain.median`

Figure S.73: Boxplots of values of `gcm.min.basin_uncertain.median` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 5$.



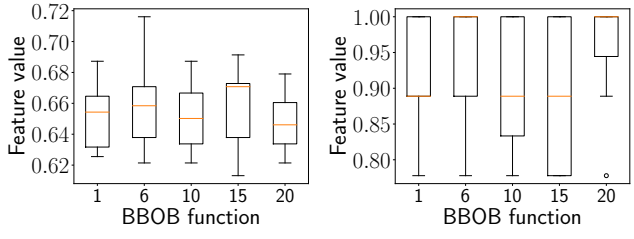
(a) `gcm.min.basin_uncertain.max` (b) `d_gcm.min.basin_uncertain.max`

Figure S.74: Boxplots of values of `gcm.min.basin_uncertain.max` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 5$.



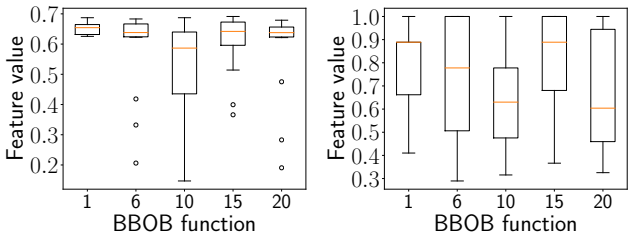
(a) `gcm.min.basin_uncertain.sd` (b) `d_gcm.min.basin_uncertain.sd`

Figure S.75: Boxplots of values of `gcm.min.basin_uncertain.sd` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 5$.



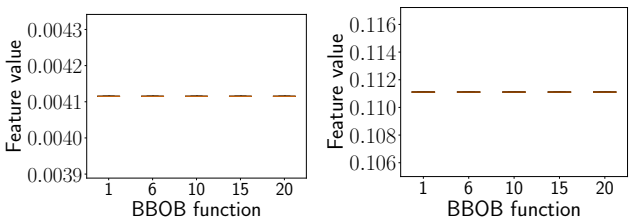
(a) `gcm.min.basin_uncertain.sum` (b) `d_gcm.min.basin_uncertain.sum`

Figure S.76: Boxplots of values of `gcm.min.basin_uncertain.sum` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 5$.



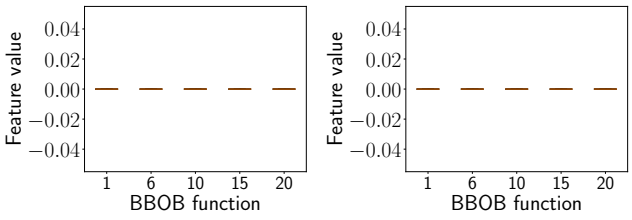
(a) `gcm.min.best_attr.prob` (b) `d_gcm.min.best_attr.prob`

Figure S.77: Boxplots of values of `gcm.min.best_attr.prob` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 5$.



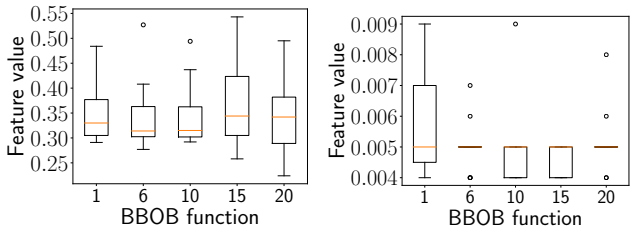
(a) `gcm.min.best_attr.no` (b) `d_gcm.min.best_attr.no`

Figure S.78: Boxplots of values of `gcm.min.best_attr.no` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 5$.



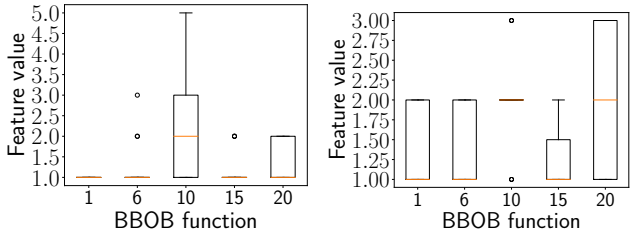
(a) `gcm.min.costs_fun_evals` (b) `d_gcm.min.costs_fun_evals`

Figure S.79: Boxplots of values of `gcm.min.costs_fun_evals` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 5$.



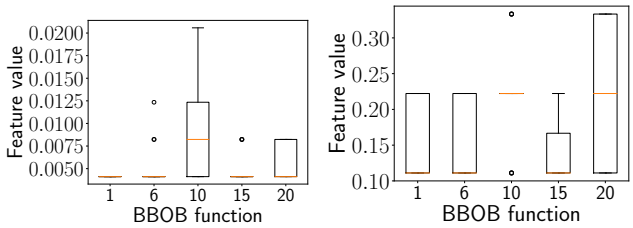
(a) `gcm.min.costs_runtime` (b) `d_gcm.min.costs_runtime`

Figure S.80: Boxplots of values of `gcm.min.costs_runtime` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 5$.



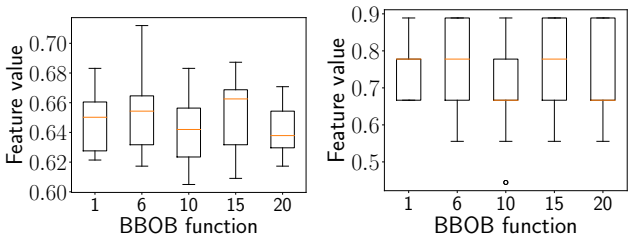
(a) `gcm.mean.attractors` (b) `d_gcm.mean.attractors`

Figure S.81: Boxplots of values of `gcm.mean.attractors` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 5$.



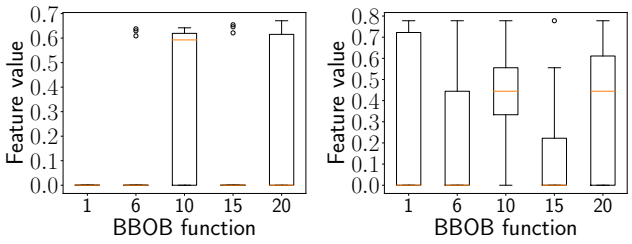
(a) `gcm.mean.pcells` (b) `d_gcm.mean.pcells`

Figure S.82: Boxplots of values of `gcm.mean.pcells` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 5$.



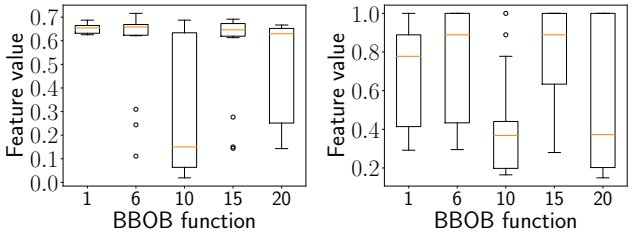
(a) `gcm.mean.tcells` (b) `d_gcm.mean.tcells`

Figure S.83: Boxplots of values of `gcm.mean.tcells` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 5$.



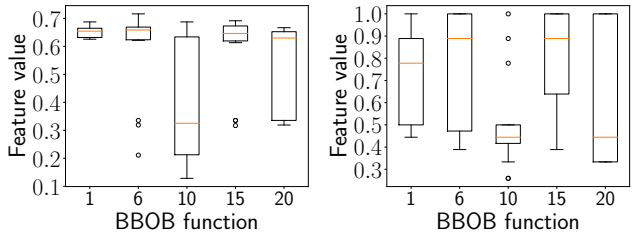
(a) `gcm.mean.uncertain` (b) `d_gcm.mean.uncertain`

Figure S.84: Boxplots of values of `gcm.mean.uncertain` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 5$.



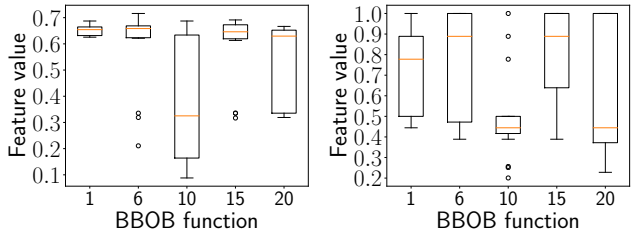
(a) `gcm.mean.basin_prob.min` (b) `d_gcm.mean.basin_prob.min`

Figure S.85: Boxplots of values of `gcm.mean.basin_prob.min` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 5$.



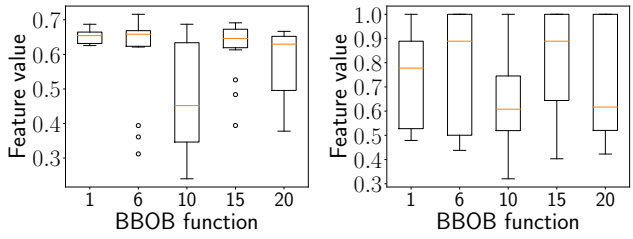
(a) `gcm.mean.basin_prob.mean` (b) `d_gcm.mean.basin_prob.mean`

Figure S.86: Boxplots of values of `gcm.mean.basin_prob.mean` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 5$.



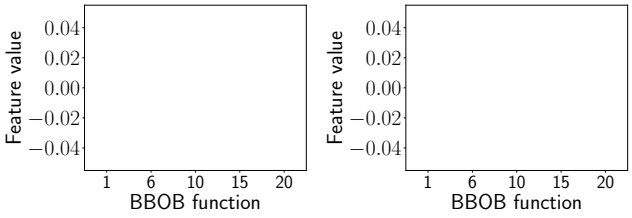
(a) `gcm.mean.basin_prob.median` (b) `d_gcm.mean.basin_prob.median`

Figure S.87: Boxplots of values of `gcm.mean.basin_prob.median` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 5$.



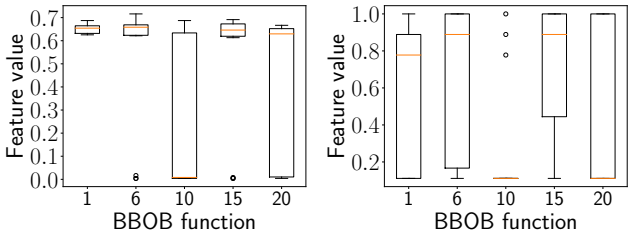
(a) `gcm.mean.basin_prob.max` (b) `d_gcm.mean.basin_prob.max`

Figure S.88: Boxplots of values of `gcm.mean.basin_prob.max` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 5$.



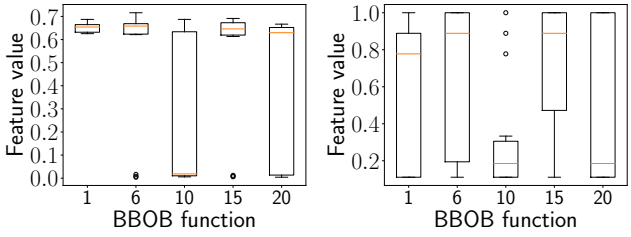
(a) `gcm.mean.basin_prob.sd` (b) `d_gcm.mean.basin_prob.sd`

Figure S.89: Boxplots of values of `gcm.mean.basin_prob.sd` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 5$.



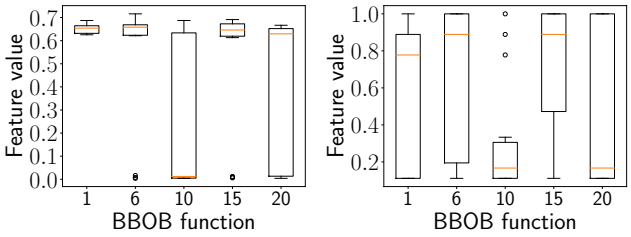
(a) `gcm.mean.basin_certain.min` (b) `d_gcm.mean.basin_certain.min`

Figure S.90: Boxplots of values of `gcm.mean.basin_certain.min` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 5$.



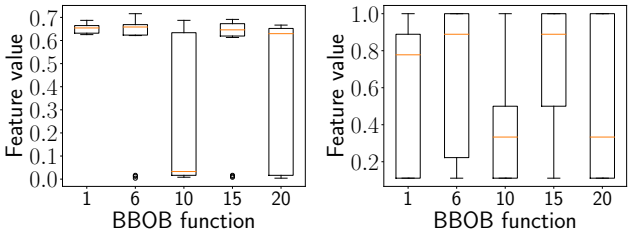
(a) `gcm.mean.basin_certain.mean` (b) `d_gcm.mean.basin_certain.mean`

Figure S.91: Boxplots of values of `gcm.mean.basin_certain.mean` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 5$.



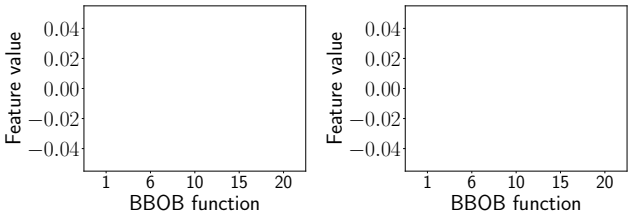
(a) `gcm.mean.basin_certain.median` (b) `d_gcm.mean.basin_certain.median`

Figure S.92: Boxplots of values of `gcm.mean.basin_certain.median` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 5$.



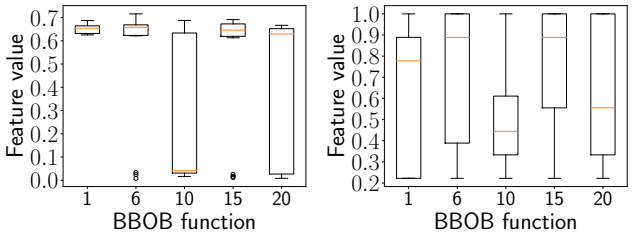
(a) `gcm.mean.basin_certain.max` (b) `d_gcm.mean.basin_certain.max`

Figure S.93: Boxplots of values of `gcm.mean.basin_certain.max` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 5$.



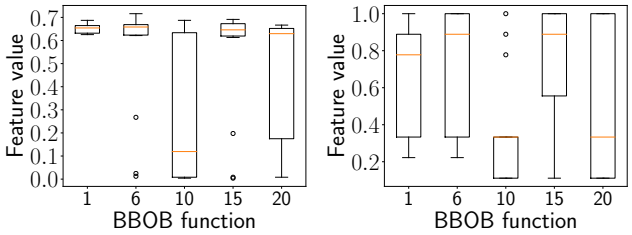
(a) `gcm.mean.basin_certain.sd` (b) `d_gcm.mean.basin_certain.sd`

Figure S.94: Boxplots of values of `gcm.mean.basin_certain.sd` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 5$.



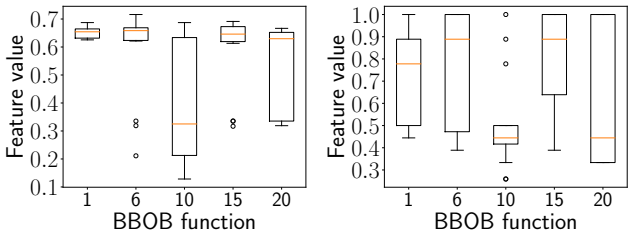
(a) `gcm.mean.basin_certain.sum` (b) `d_gcm.mean.basin_certain.sum`

Figure S.95: Boxplots of values of `gcm.mean.basin_certain.sum` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 5$.



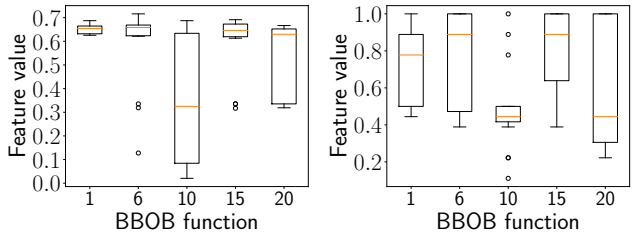
(a) `gcm.mean.basin_uncertain.min` (b) `d_gcm.mean.basin_uncertain.min`

Figure S.96: Boxplots of values of `gcm.mean.basin_uncertain.min` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 5$.



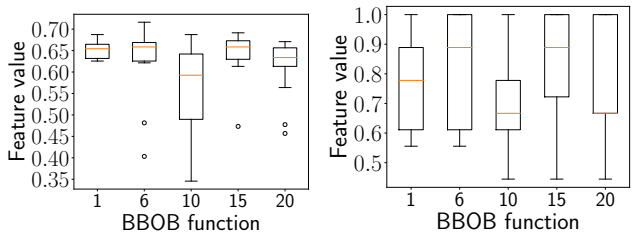
(a) `gcm.mean.basin_uncertain.mean` (b) `d_gcm.mean.basin_uncertain.mean`

Figure S.97: Boxplots of values of `gcm.mean.basin_uncertain.mean` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 5$.



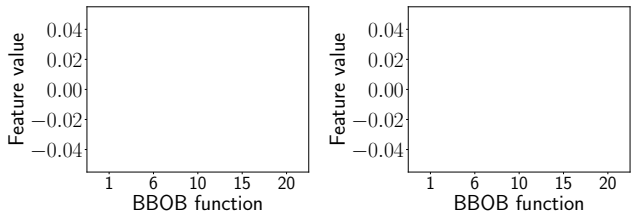
(a) `gcm.mean.basin_uncertain.median` (b) `d_gcm.mean.basin_uncertain.median`

Figure S.98: Boxplots of values of `gcm.mean.basin_uncertain.median` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 5$.



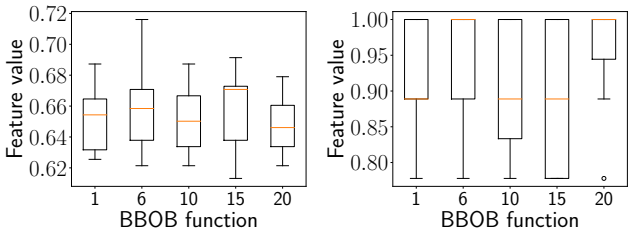
(a) `gcm.mean.basin_uncertain.max` (b) `d_gcm.mean.basin_uncertain.max`

Figure S.99: Boxplots of values of `gcm.mean.basin_uncertain.max` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 5$.



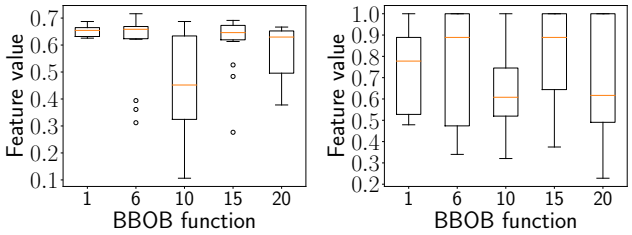
(a) `gcm.mean.basin_uncertain.sd` (b) `d_gcm.mean.basin_uncertain.sd`

Figure S.100: Boxplots of values of `gcm.mean.basin_uncertain.sd` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 5$.



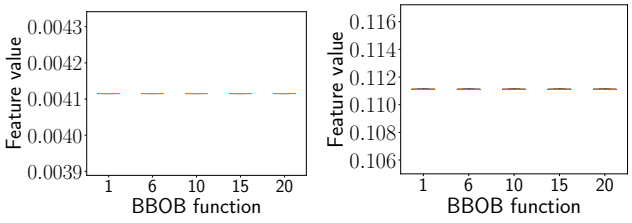
(a) `gcm.mean.basin_uncertain.sum` (b) `d_gcm.mean.basin_uncertain.sum`

Figure S.101: Boxplots of values of `gcm.mean.basin_uncertain.sum` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 5$.



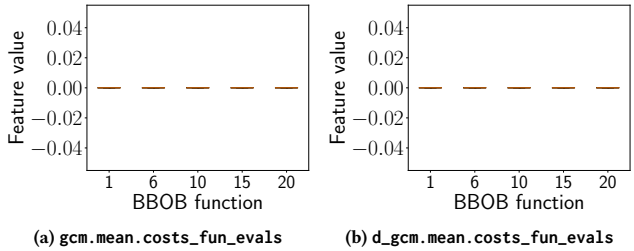
(a) `gcm.mean.best_attr.prob` (b) `d_gcm.mean.best_attr.prob`

Figure S.102: Boxplots of values of `gcm.mean.best_attr.prob` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 5$.



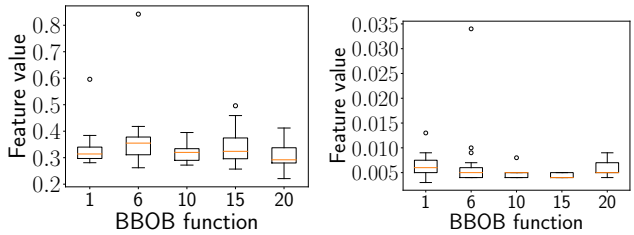
(a) `gcm.mean.best_attr.no` (b) `d_gcm.mean.best_attr.no`

Figure S.103: Boxplots of values of `gcm.mean.best_attr.no` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 5$.



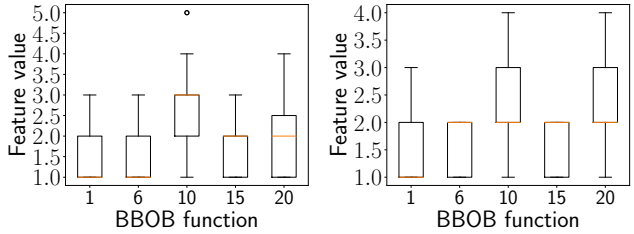
(a) `gcm.mean.costs_fun_evals` (b) `d_gcm.mean.costs_fun_evals`

Figure S.104: Boxplots of values of `gcm.mean.costs_fun_evals` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 5$.



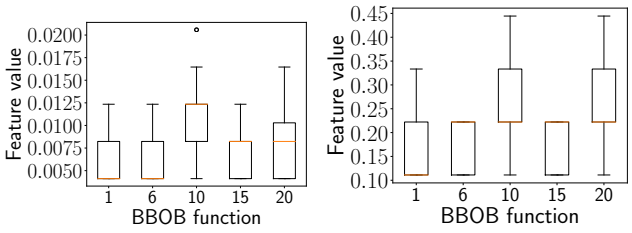
(a) `gcm.mean.costs_runtime` (b) `d_gcm.mean.costs_runtime`

Figure S.105: Boxplots of values of `gcm.mean.costs_runtime` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 5$.



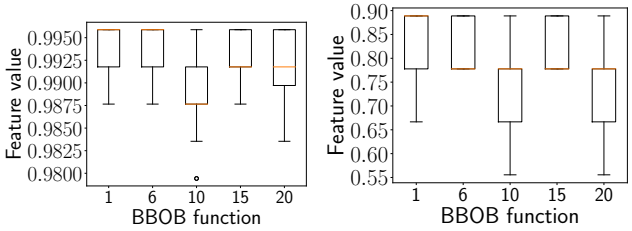
(a) `gcm.near.attractors` (b) `d_gcm.near.attractors`

Figure S.106: Boxplots of values of `gcm.near.attractors` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 5$.



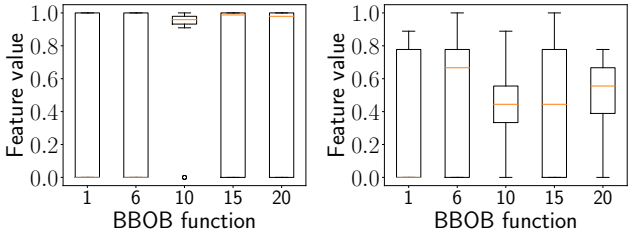
(a) `gcm.near.pcells` (b) `d_gcm.near.pcells`

Figure S.107: Boxplots of values of `gcm.near.pcells` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 5$.



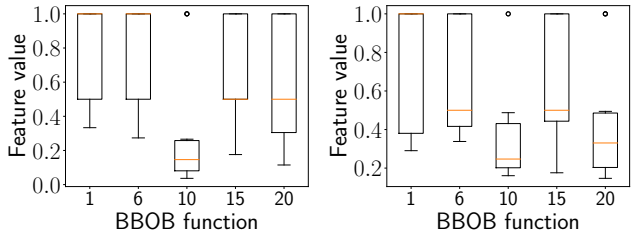
(a) `gcm.near.tcells` (b) `d_gcm.near.tcells`

Figure S.108: Boxplots of values of `gcm.near.tcells` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 5$.



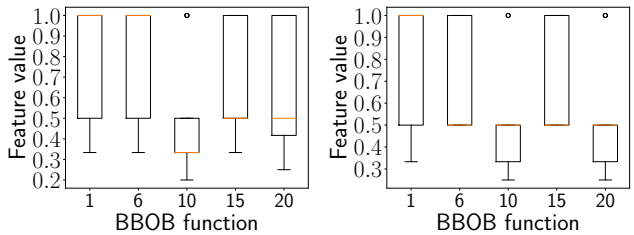
(a) `gcm.near.uncertain` (b) `d_gcm.near.uncertain`

Figure S.109: Boxplots of values of `gcm.near.uncertain` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 5$.



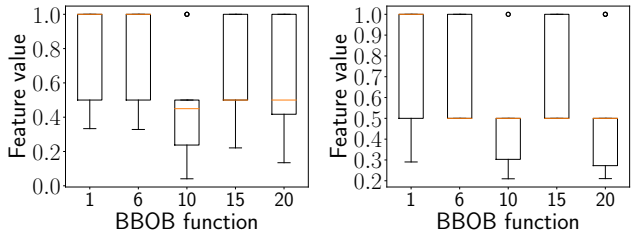
(a) `gcm.near.basin_prob.min` (b) `d_gcm.near.basin_prob.min`

Figure S.110: Boxplots of values of `gcm.near.basin_prob.min` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 5$.



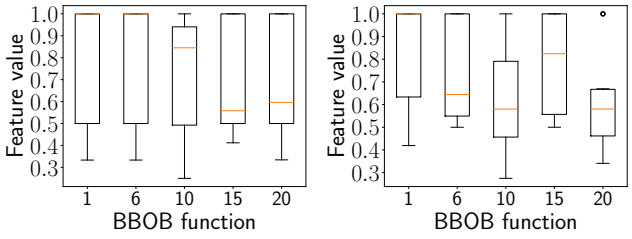
(a) `gcm.near.basin_prob.mean` (b) `d_gcm.near.basin_prob.mean`

Figure S.111: Boxplots of values of `gcm.near.basin_prob.mean` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 5$.



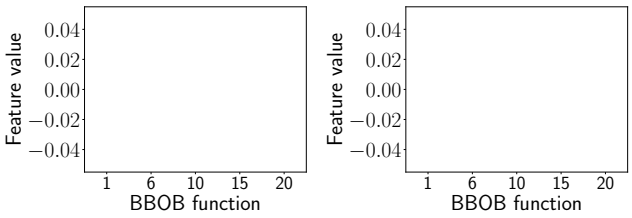
(a) `gcm.near.basin_prob.median` (b) `d_gcm.near.basin_prob.median`

Figure S.112: Boxplots of values of `gcm.near.basin_prob.median` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 5$.



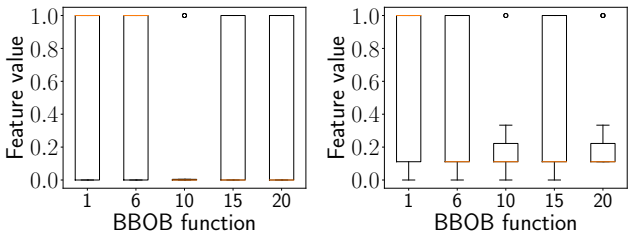
(a) `gcm.near.basin_prob.max` (b) `d_gcm.near.basin_prob.max`

Figure S.113: Boxplots of values of `gcm.near.basin_prob.max` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 5$.



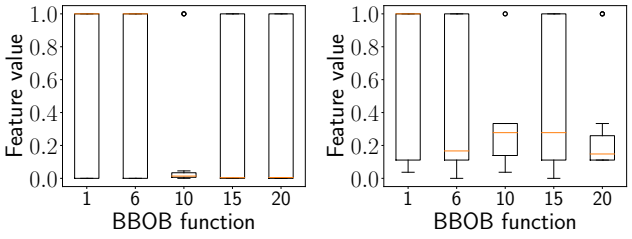
(a) `gcm.near.basin_prob.sd` (b) `d_gcm.near.basin_prob.sd`

Figure S.114: Boxplots of values of `gcm.near.basin_prob.sd` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 5$.



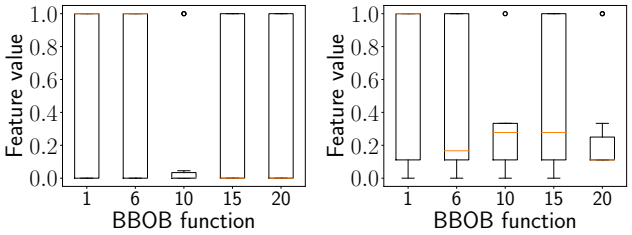
(a) `gcm.near.basin_certain.min` (b) `d_gcm.near.basin_certain.min`

Figure S.115: Boxplots of values of `gcm.near.basin_certain.min` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 5$.



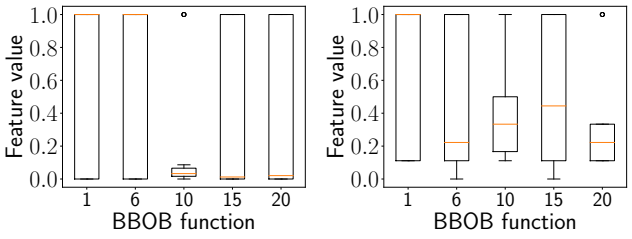
(a) `gcm.near.basin_certain.mean` (b) `d_gcm.near.basin_certain.mean`

Figure S.116: Boxplots of values of `gcm.near.basin_certain.mean` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 5$.



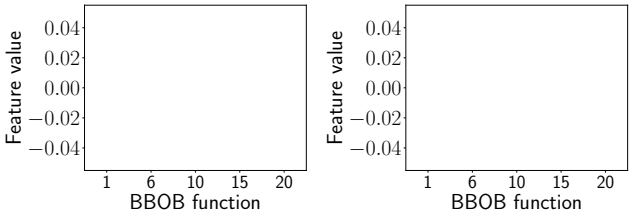
(a) `gcm.near.basin_certain.median` (b) `d_gcm.near.basin_certain.median`

Figure S.117: Boxplots of values of `gcm.near.basin_certain.median` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 5$.



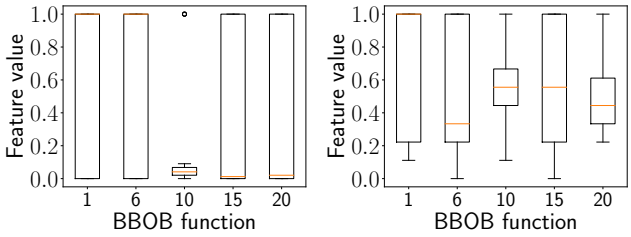
(a) `gcm.near.basin_certain.max` (b) `d_gcm.near.basin_certain.max`

Figure S.118: Boxplots of values of `gcm.near.basin_certain.max` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 5$.



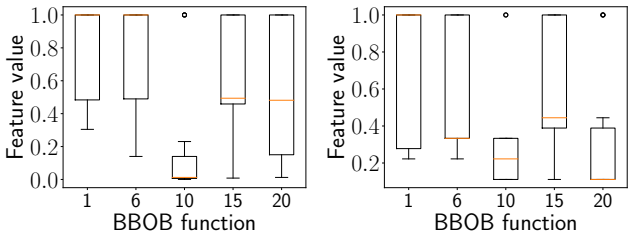
(a) `gcm.near.basin_certain.sd` (b) `d_gcm.near.basin_certain.sd`

Figure S.119: Boxplots of values of `gcm.near.basin_certain.sd` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 5$.



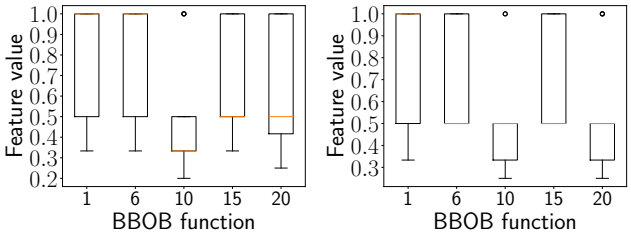
(a) `gcm.near.basin_certain.sum` (b) `d_gcm.near.basin_certain.sum`

Figure S.120: Boxplots of values of `gcm.near.basin_certain.sum` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 5$.



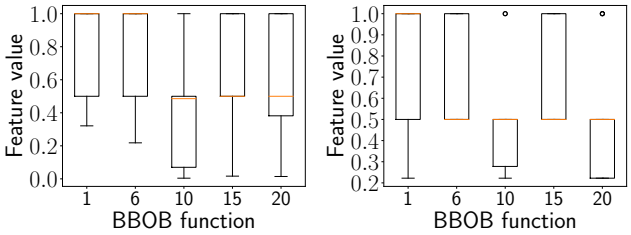
(a) `gcm.near.basin_uncertain.min` (b) `d_gcm.near.basin_uncertain.min`

Figure S.121: Boxplots of values of `gcm.near.basin_uncertain.min` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 5$.



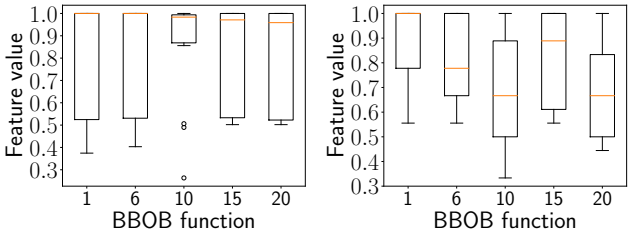
(a) `gcm.near.basin_uncertain.mean` (b) `d_gcm.near.basin_uncertain.mean`

Figure S.122: Boxplots of values of `gcm.near.basin_uncertain.mean` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 5$.



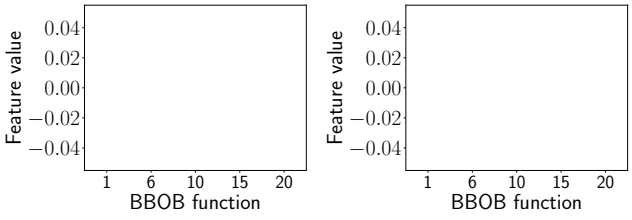
(a) `gcm.near.basin_uncertain.median` (b) `d_gcm.near.basin_uncertain.median`

Figure S.123: Boxplots of values of `gcm.near.basin_uncertain.median` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 5$.



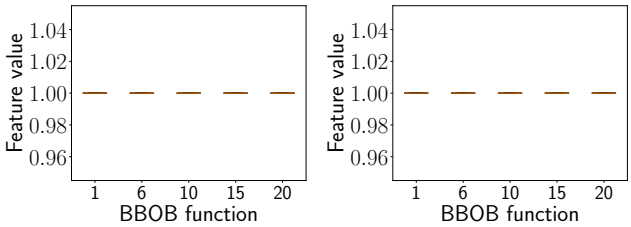
(a) `gcm.near.basin_uncertain.max` (b) `d_gcm.near.basin_uncertain.max`

Figure S.124: Boxplots of values of `gcm.near.basin_uncertain.max` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 5$.



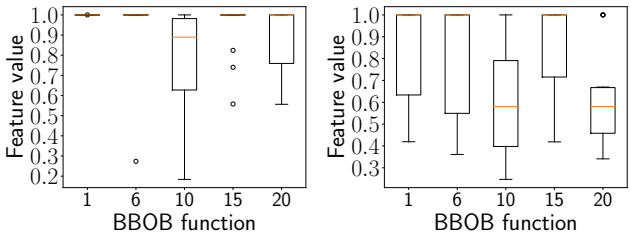
(a) `gcm.near.basin_uncertain.sd` (b) `d_gcm.near.basin_uncertain.sd`

Figure S.125: Boxplots of values of `gcm.near.basin_uncertain.sd` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 5$.



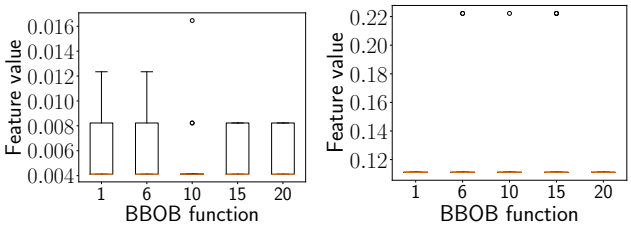
(a) `gcm.near.basin_uncertain.sum` (b) `d_gcm.near.basin_uncertain.sum`

Figure S.126: Boxplots of values of `gcm.near.basin_uncertain.sum` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 5$.



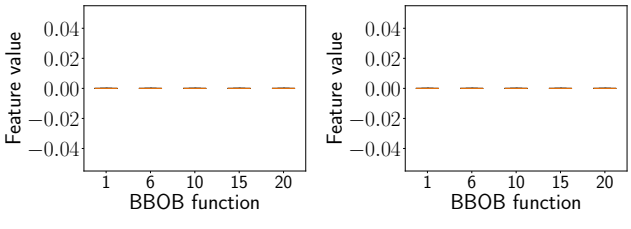
(a) `gcm.near.best_attr.prob` (b) `d_gcm.near.best_attr.prob`

Figure S.127: Boxplots of values of `gcm.near.best_attr.prob` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 5$.



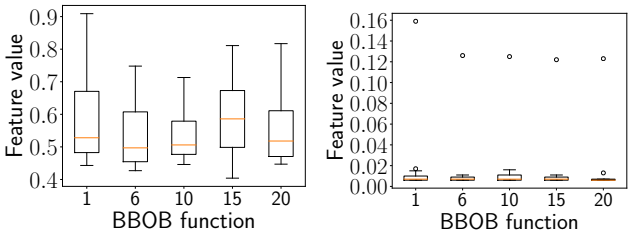
(a) `gcm.near.best_attr.no` (b) `d_gcm.near.best_attr.no`

Figure S.128: Boxplots of values of `gcm.near.best_attr.no` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 5$.



(a) `gcm.near.costs_fun_evals` (b) `d_gcm.near.costs_fun_evals`

Figure S.129: Boxplots of values of `gcm.near.costs_fun_evals` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 5$.



(a) `gcm.near.costs_runtime` (b) `d_gcm.near.costs_runtime`

Figure S.130: Boxplots of values of `gcm.near.costs_runtime` and its dimensionality reduction version on 15 instances of f_1, f_6, f_{10}, f_{15}, and f_{20} with $n = 5$.

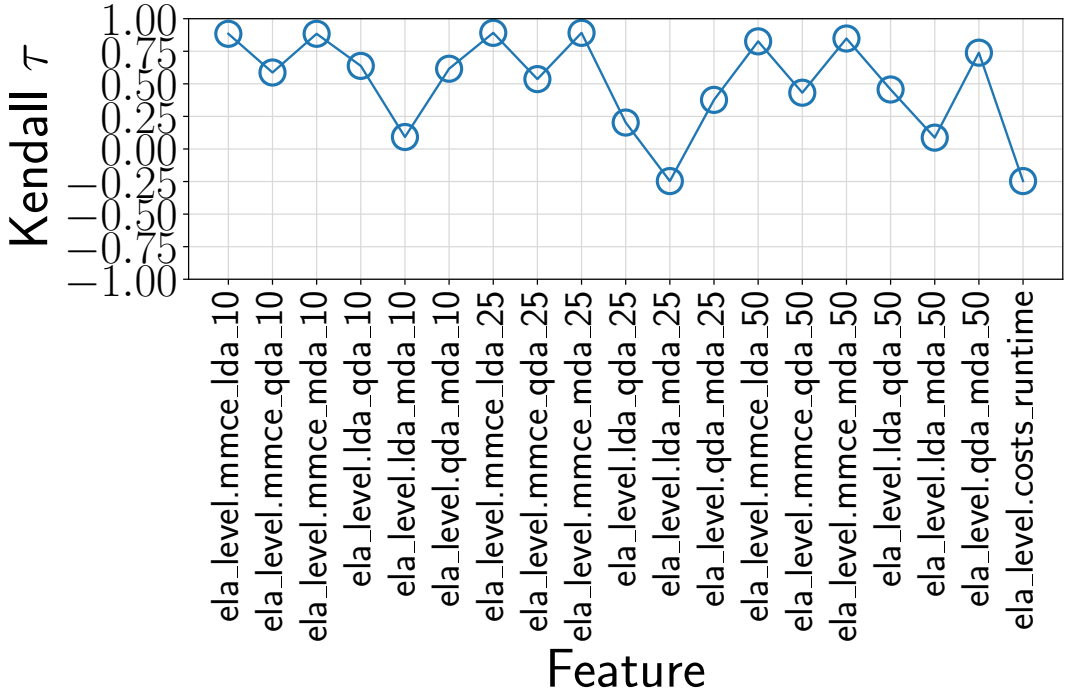


Figure S.131: Kendall τ values of `ela_level` and `d_ela_level` for $n = 160$.

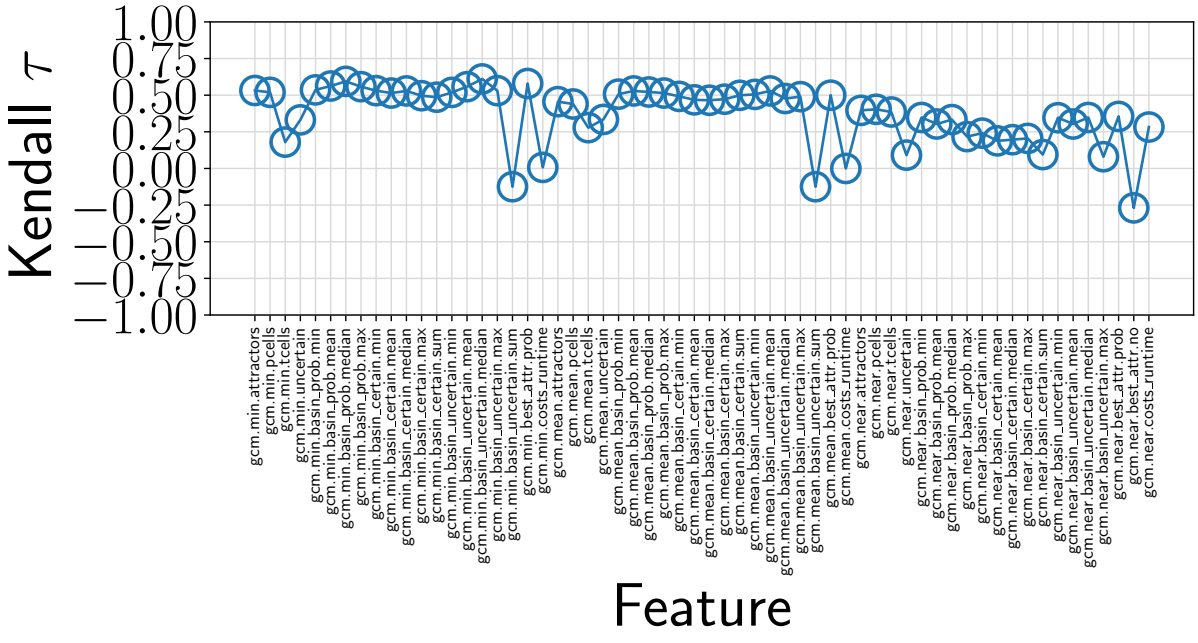


Figure S.132: Kendall τ values of `gcm` and `d_gcm` for $n = 5$.

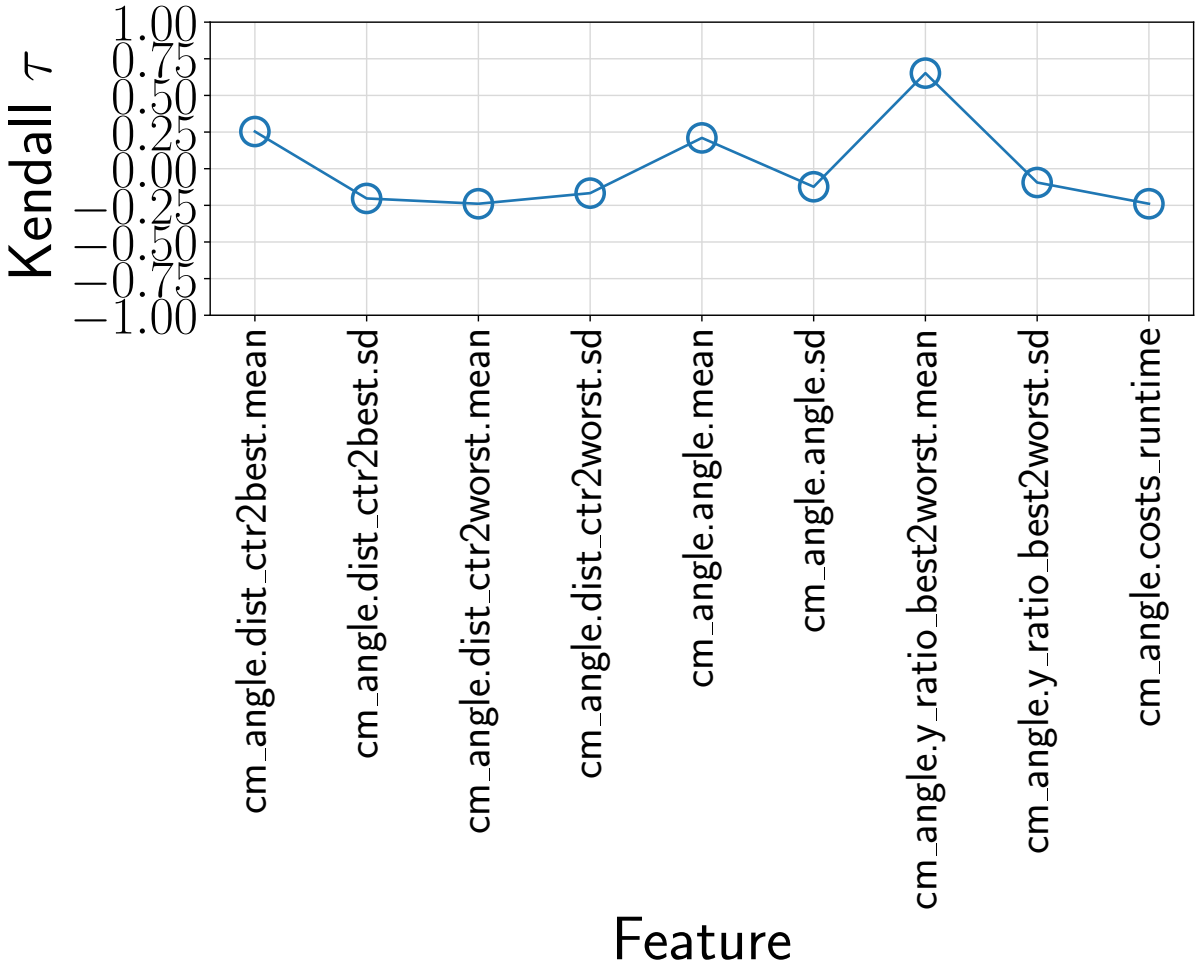


Figure S.133: Kendall τ values of `cm_angle` and `d_cm_angle` for $n = 5$.

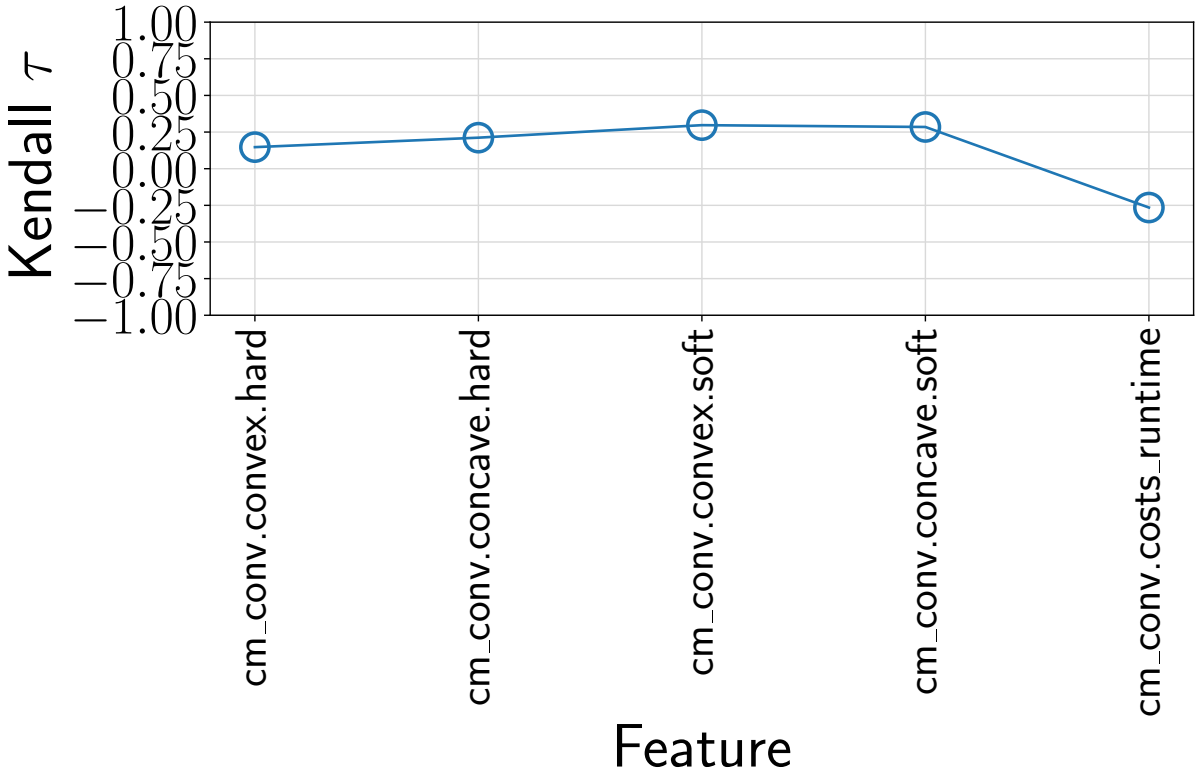


Figure S.134: Kendall τ values of `cm_conv` and `d_cm_conv` for $n = 5$.

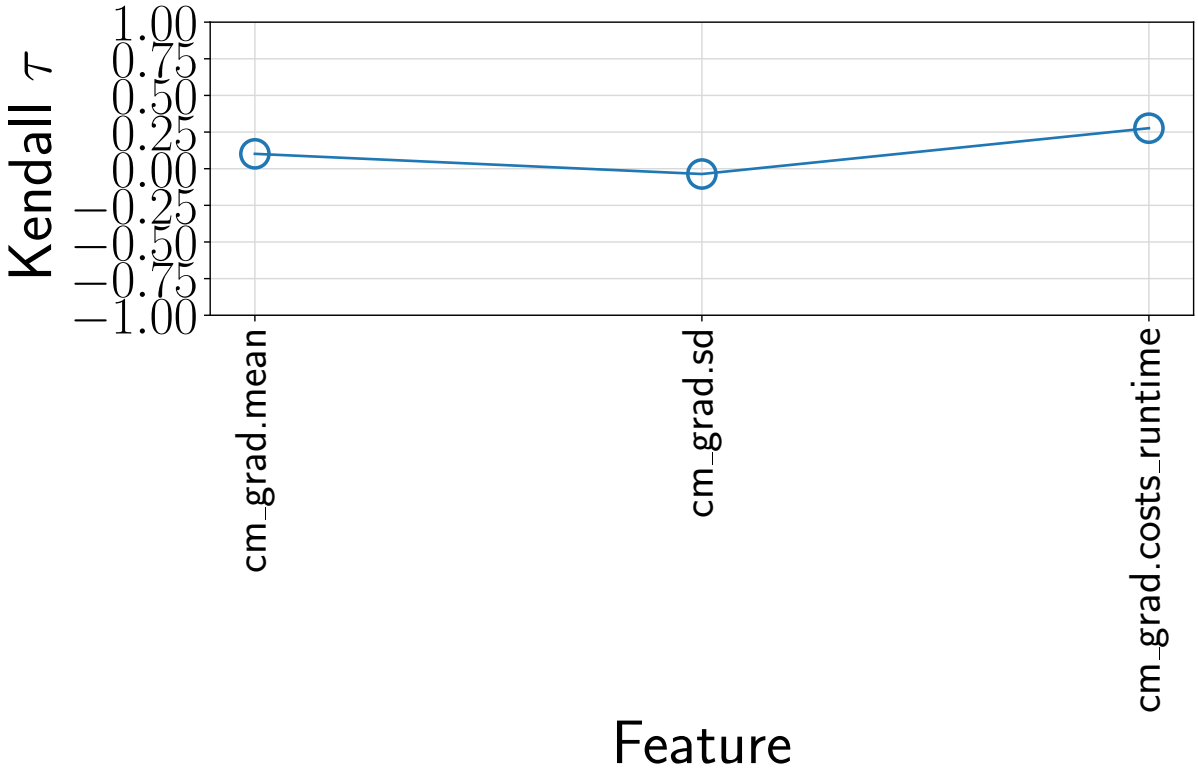


Figure S.135: Kendall τ values of `cm_grad` and `d_cm_grad` for $n = 5$.