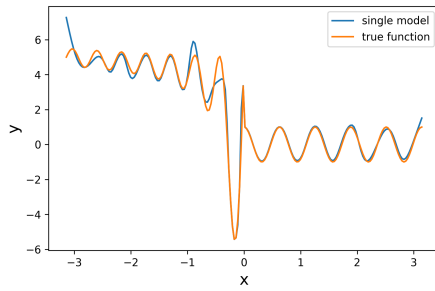


Case study on ensembles

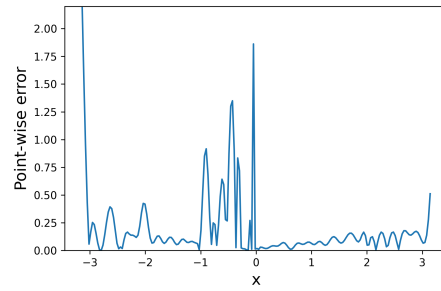
Apostolos Psaros

October 15, 2020

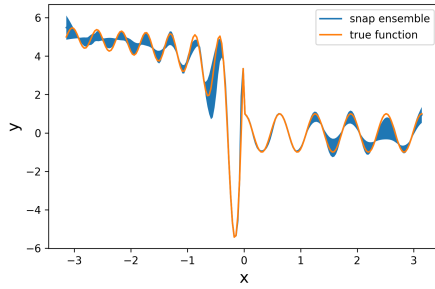
1 Figures



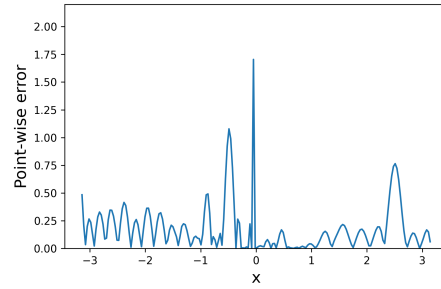
(a) a



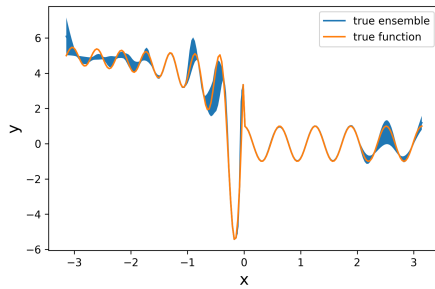
(b) b



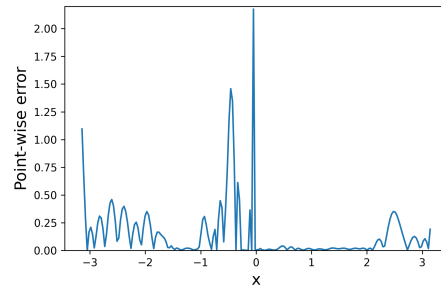
(c) c



(d) d



(e) e



(f) f

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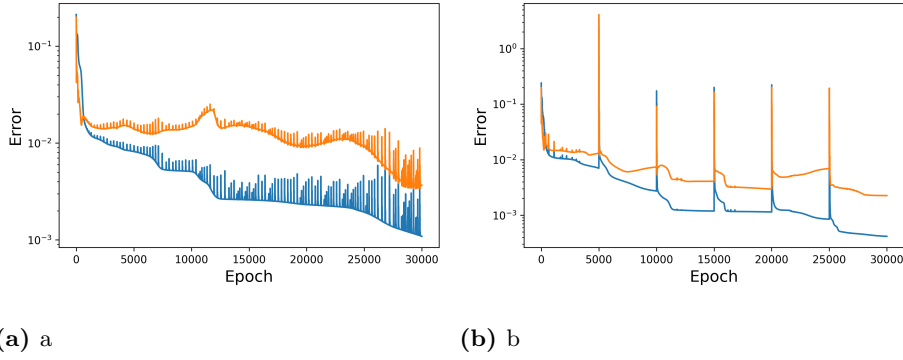
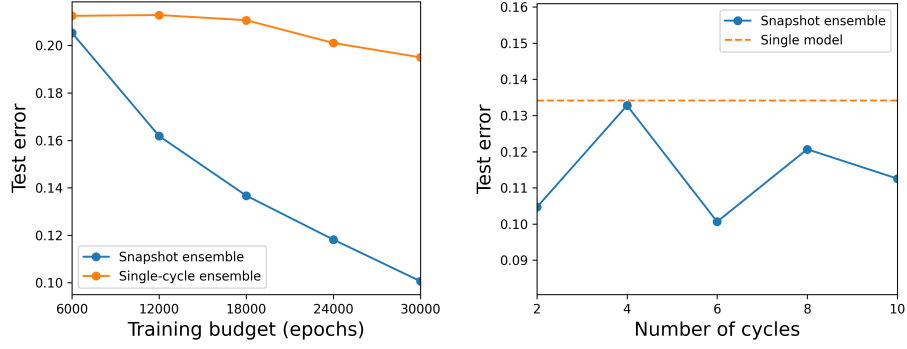


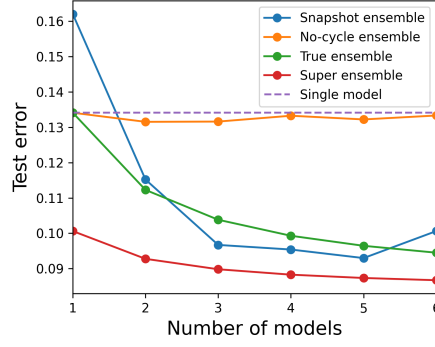
Fig. 2. caption.

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(a) Varying budget for fixed number of cycles (6) and number of snapshots (6). (b) Varying number of cycles for fixed budget (30,000 epochs) and number of snapshots (same as number of cycles).



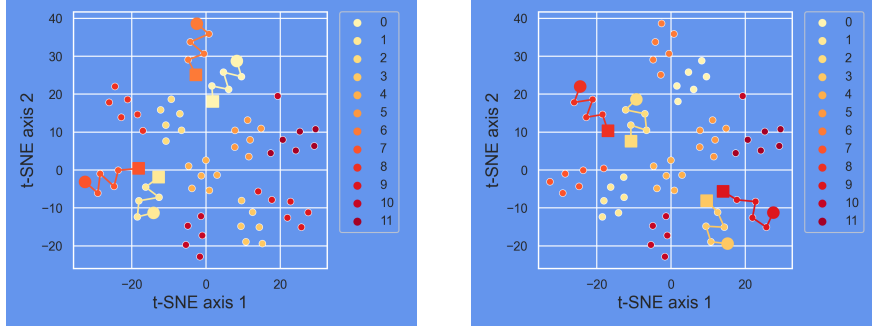
(c) Varying number of snapshots for fixed number of cycles (6) and budget (30,000 epochs).

Fig. 3. Comparisons between single models, snapshot ensembles, no-cycle ensembles (standard lr), single-cycle ensembles (cosine annealing with no warm restarts), and true ensembles.

	1	2	3	4	5	6
6	0.07	0.06	0.06	0.07	0.07	0.09
5	0.08	0.06	0.06	0.07	0.07	0.09
4	0.09	0.07	0.06	0.07	0.08	0.09
3	0.1	0.07	0.07	0.08	0.08	0.09
2	0.12	0.09	0.08	0.08	0.08	0.09
1	0.16	0.12	0.1	0.1	0.09	0.1

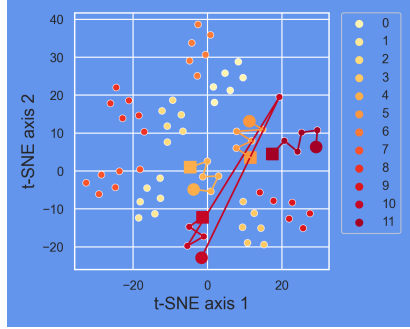
Fig. 4. Put your sub-caption here

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(a) Put your sub-caption here

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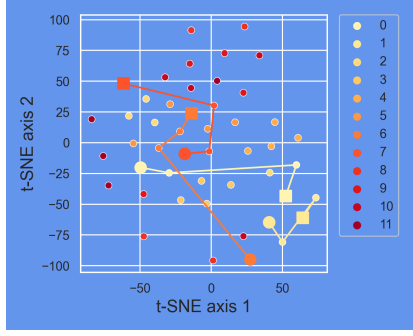


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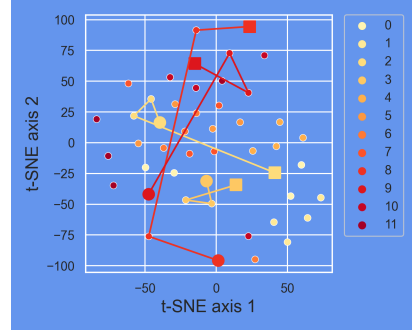
Fig. 5. Put your caption here

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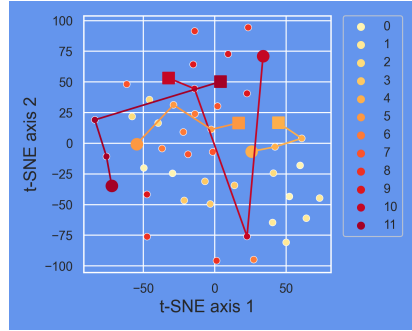
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(a) Put your sub-caption here



(b) Put your sub-caption here



(c) Put your sub-caption here

Fig. 6. Put your caption here

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Standard learning rate

	1	2	3	4	5	6
0.2	1.0	0.97	0.89	0.85	0.8	0.77
0.2	0.97	1.0	0.95	0.9	0.85	0.82
0.2	0.89	0.95	1.0	0.97	0.92	0.9
0.2	0.85	0.9	0.97	1.0	0.96	0.94
0.1	0.8	0.85	0.92	0.96	1.0	0.99
0.1	0.77	0.82	0.9	0.94	0.99	1.0

Cosine annealing

	1	2	3	4	5	6
0.3	1.0	0.91	0.86	0.81	0.74	0.7
0.2	0.91	1.0	0.98	0.93	0.85	0.81
0.1	0.86	0.98	1.0	0.96	0.88	0.84
0.1	0.81	0.93	0.96	1.0	0.93	0.89
0.0	0.74	0.85	0.88	0.93	1.0	0.97
0.4	0.7	0.81	0.84	0.89	0.97	1.0

(a) Put your sub-caption here

Standard learning rate

	1	2	3	4	5	6
0.2	1.0	0.99	0.98	0.99	0.98	0.98
0.2	0.99	1.0	0.99	0.99	0.98	0.98
0.2	0.98	0.99	1.0	1.0	0.98	0.98
0.2	0.99	0.99	1.0	1.0	0.99	0.99
0.1	0.98	0.98	0.98	0.99	1.0	1.0
0.1	0.98	0.98	0.98	0.99	1.0	1.0

Cosine annealing

	1	2	3	4	5	6
0.3	1.0	0.99	0.98	0.98	0.99	0.98
0.2	0.99	1.0	0.99	0.99	0.99	0.97
0.1	0.98	0.99	1.0	1.0	0.99	0.97
0.1	0.98	0.99	1.0	1.0	1.0	0.98
0.0	0.99	0.99	0.99	1.0	1.0	0.99
0.4	0.98	0.97	0.97	0.98	0.99	1.0

(b) Put your sub-caption here

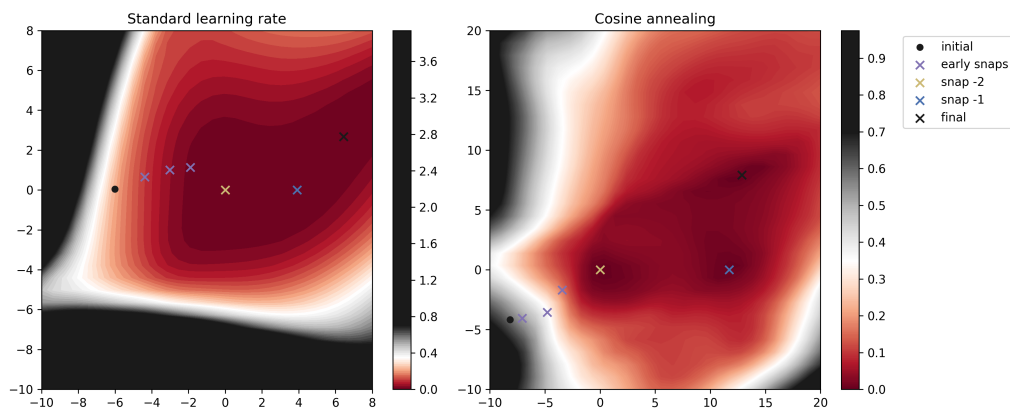


Fig. 8

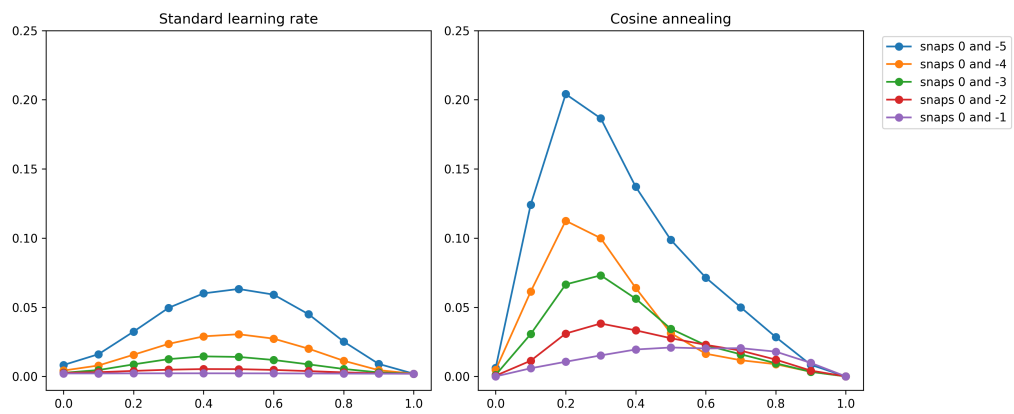


Fig. 9

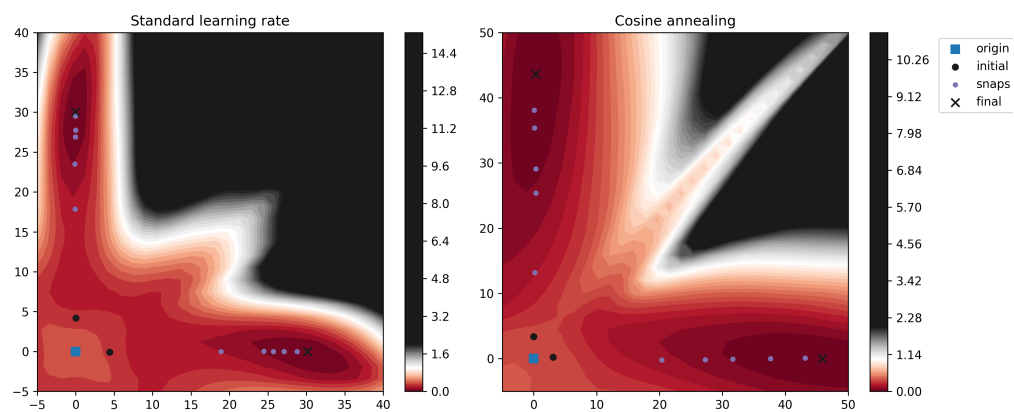


Fig. 10