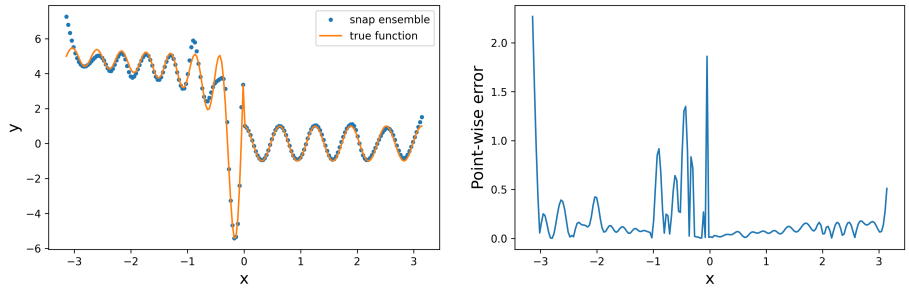
Case study on ensembles

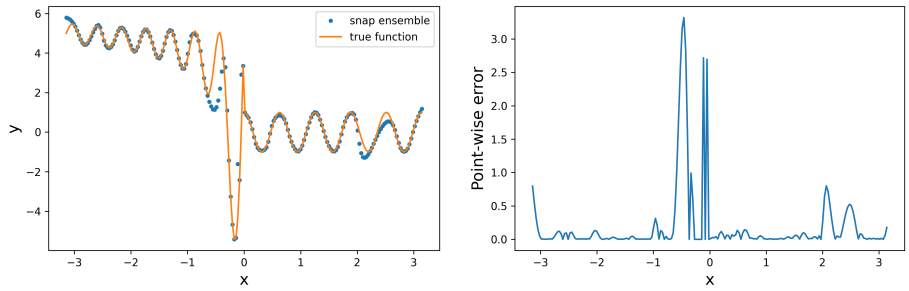
Apostolos Psaros

October 14, 2020

1 Figures



(a) a **(b)** b

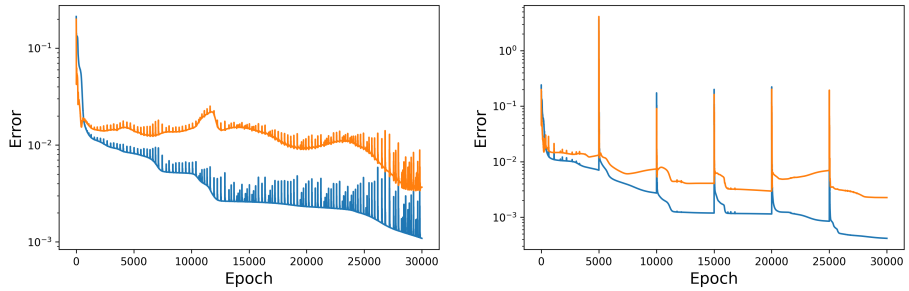


(c) c **(d)** d

Fig. 1. caption.

Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Etiam lobortis facilisis sem. Nullam nec mi et neque pharetra sollicitudin. Praesent imperdiet mi nec ante. Donec ullamcorper, felis non sodales commodo, lectus velit ultrices augue, a dignissim nibh lectus placerat pede. Vivamus nunc nunc, molestie ut, ultricies vel, semper in, velit. Ut porttitor. Praesent in sapien. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Duis fringilla tristique neque. Sed interdum libero ut metus. Pellentesque placerat. Nam rutrum augue a leo. Morbi sed elit sit amet ante lobortis sollicitudin. Praesent blandit blandit mauris. Praesent lectus tellus, aliquet aliquam, luctus a, egestas a, turpis. Mauris lacinia lorem sit amet ipsum. Nunc quis urna dictum turpis accumsan

semper.



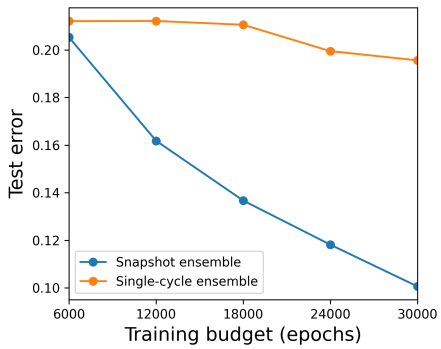
(a) a **(b)** b

Fig. 2. caption.

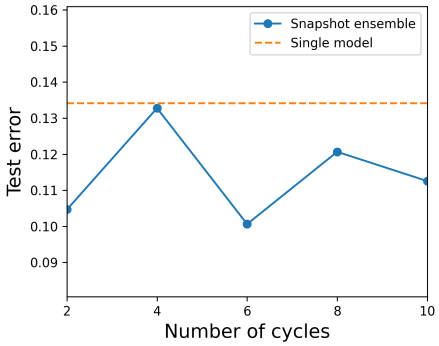
Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Etiam lobortis facilisis sem. Nullam nec mi et neque pharetra sollicitudin. Praesent imperdiet mi nec ante. Donec ullamcorper, felis non sodales commodo, lectus velit ultrices augue, a dignissim nibh lectus placerat pede. Vivamus nunc nunc, molestie ut, ultricies vel, semper in, velit. Ut porttitor. Praesent in sapien. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Duis fringilla tristique neque. Sed interdum libero ut metus. Pellentesque placerat. Nam rutrum augue a leo. Morbi sed elit sit amet ante lobortis sollicitudin. Praesent blandit blandit mauris. Praesent lectus tellus, aliquet aliquam, luctus a, egestas a, turpis. Mauris lacinia lorem sit amet ipsum. Nunc quis urna dictum turpis accumsan semper.

Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Etiam lobortis facilisis sem. Nullam nec mi et neque pharetra sollicitudin. Praesent imperdiet mi nec ante. Donec ullamcorper, felis non sodales commodo, lectus velit ultrices augue, a dignissim nibh lectus placerat pede. Vivamus nunc nunc, molestie ut, ultricies vel, semper in, velit. Ut porttitor. Praesent in sapien. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Duis fringilla tristique neque. Sed interdum libero ut metus. Pellentesque placerat. Nam rutrum augue a leo. Morbi sed elit sit amet ante lobortis sollicitudin. Praesent blandit blandit mauris. Praesent lectus tellus, aliquet aliquam, luctus a, egestas a, turpis. Mauris lacinia lorem sit amet ipsum. Nunc quis urna dictum turpis accumsan semper.

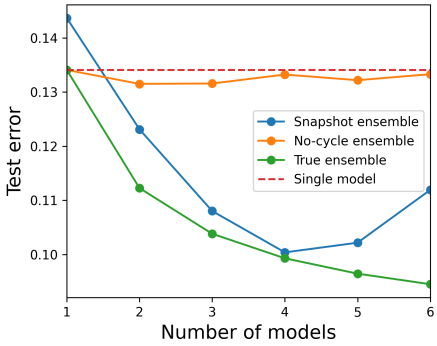
Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Etiam lobortis facilisis



(a) Varying budget for fixed number of cycles (6) and number of snapshots (6).

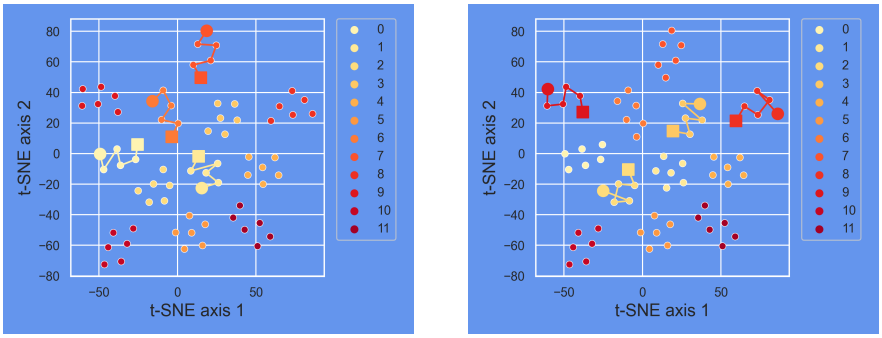


(b) Varying number of cycles for fixed budget (30,000 epochs) and number of snapshots (same as number of cycles).

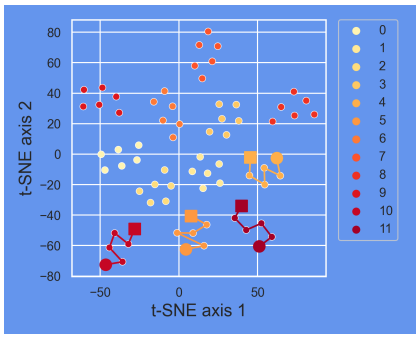


(c) Varying number of snapshots for fixed number of cycles (6) and budget (30,000 epochs).

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.



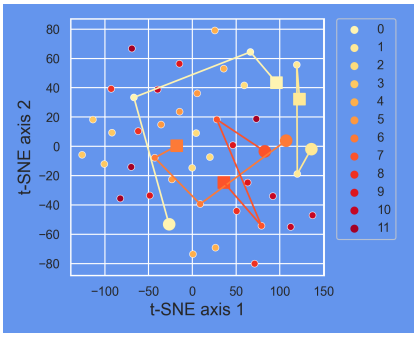
(a) Put your sub-caption here **(b)** Put your sub-caption here



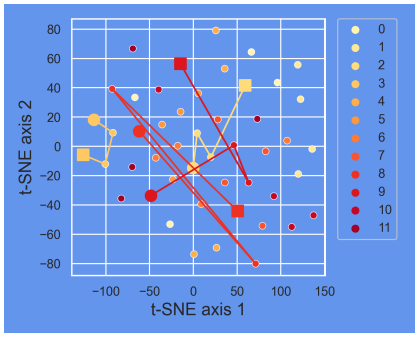
(c) Put your sub-caption here

Fig. 4. Put your caption here

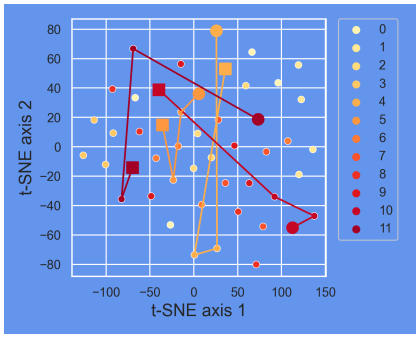
sem. Nullam nec mi et neque pharetra sollicitudin. Praesent imperdiet mi nec ante. Donec ullamcorper, felis non sodales commodo, lectus velit ultrices augue, a dignissim nibh lectus placerat pede. Vivamus nunc nunc, molestie ut, ultricies vel, semper in, velit. Ut porttitor. Praesent in sapien. Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Duis fringilla tristique neque. Sed interdum libero ut metus. Pellentesque placerat. Nam rutrum augue a leo. Morbi sed elit sit amet ante lobortis sollicitudin. Praesent blandit blandit mauris. Praesent lectus tellus, aliquet aliquam, luctus a, egestas a, turpis. Mauris lacinia lorem sit amet ipsum. Nunc quis urna dictum turpis accumsan semper.



(a) Put your sub-caption here



(b) Put your sub-caption here



(c) Put your sub-caption here

Fig. 5. Put your caption here

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
0.5	1.0	0.9	0.81	0.74	0.68	0.66
0.4	0.9	1.0	0.91	0.84	0.78	0.77
0.2	0.81	0.91	1.0	0.94	0.86	0.85
0.1	0.74	0.84	0.94	1.0	0.94	0.93
0.1	0.68	0.78	0.86	0.94	1.0	0.99
0.3	0.66	0.77	0.85	0.93	0.99	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
0.5	1.0	1.0	0.99	0.98	0.98	0.97
0.4	1.0	1.0	0.99	0.99	0.99	0.98
0.2	0.99	0.99	1.0	1.0	0.99	0.98
0.1	0.98	0.99	1.0	1.0	0.99	0.98
0.1	0.98	0.99	0.99	0.99	1.0	0.99
0.3	0.97	0.98	0.98	0.98	0.99	1.0

(b) Put your sub-caption here