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	authors	• Urvil Nileshbhai Jivani • Omatharv Bharat Vaidya • Anwesh Bhattacharya • Snehanshu Saha	**authors**	• Urvil Nileshbhai Jivani • Omatharv Bharat Vaidya • Anwesh Bhattacharya • Snehanshu Saha	DUPLICATES	51
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	id	id6876482801666510898	**id**	id-8818355445722341273		
	abstract	This paper introduces application of the Exponentially Averaged Momentum Particle Swarm Optimization (EM-PSO) as a derivative-free optimizer for Neural Networks. It adopts PSO's major advantages such as search space exploration and higher robustness to local minima compared to gradient-descent optimizers such as Adam. Neural network based solvers endowed with gradient optimization are now being used to approximate solutions to Differential Equations. Here, we demonstrate the novelty of EM-PSO in approximating gradients and leveraging the property in solving the Schr\"odinger equation, for the Particle-in-a-Box problem. We also provide the optimal set of hyper-parameters supported by mathematical proofs, suited for our algorithm.	**abstract**	This paper introduces application of the Exponentially Averaged Momentum Particle Swarm Optimization (EM-PSO) as a derivative-free optimizer for Neural Networks. It adopts PSO's major advantages such as search space exploration and higher robustness to local minima compared to gradient-descent optimizers such as Adam. Neural network based solvers endowed with gradient optimization are now being used to approximate solutions to Differential Equations. Here, we demonstrate the novelty of EM-PSO in approximating gradients and leveraging the property in solving the Schr\"odinger equation, for the Particle-in-a-Box problem. We also provide the optimal set of hyper-parameters supported by mathematical proofs, suited for our algorithm.		
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