cases	doc_1		doc_2		decision	id
			authors	• Zhi-Qin John Xu • Wei Cai • Ziqi Liu	NOT DUPLICATES	252
	authors	• Liu, Z.	**title**	Multi-scale Deep Neural Network (MscaleDNN) for Solving Poisson-Boltzmann Equation in Complex Domains		
	title	Multi-Scale Deep Neural Network (MscaleDNN) for Solving Poisson-Boltzmann Equation in Complex Domains	**publication_date**	2020-07-22 00:00:00		
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	doi	10.4208/cicp.oa-2020-0179	**urls**	• https://arxiv.org/pdf/2007.11207v3.pdf • https://github.com/xuzhiqin1990/mscalednn		
	urls	• http://dx.doi.org/10.4208/cicp.oa-2020-0179	**id**	id7051780797741875897		
	id	id3837776719857527842	**abstract**	In this paper, we propose multi-scale deep neural networks (MscaleDNNs) using the idea of radial scaling in frequency domain and activation functions with compact support. The radial scaling converts the problem of approximation of high frequency contents of PDEs' solutions to a problem of learning about lower frequency functions, and the compact support activation functions facilitate the separation of frequency contents of the target function to be approximated by corresponding DNNs. As a result, the MscaleDNNs achieve fast uniform convergence over multiple scales. The proposed MscaleDNNs are shown to be superior to traditional fully connected DNNs and be an effective mesh-less numerical method for Poisson-Boltzmann equations with ample frequency contents over complex and singular domains.		
	abstract		**versions**			
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