

cases	doc_1		doc_2		decision	id
	authors	<ul style="list-style-type: none"><li>• Zong-Yi Li</li><li>• Nikola B. Kovachki</li><li>• K. Azizzadenesheli</li><li>• Burigede Liu</li><li>• K. Bhattacharya</li><li>• Andrew Stuart</li><li>• Anima Anandkumar</li></ul>	authors	<ul style="list-style-type: none"><li>• Zongyi Li</li><li>• Nikola Kovachki</li><li>• Kamyar Azizzadenesheli</li><li>• Burigede Liu, Kaushik Bhattacharya</li><li>• Andrew Stuart</li><li>• Anima Anandkumar</li></ul>	DUPLICATES	67
	title	Neural Operator: Graph Kernel Network for Partial Differential Equations	title	Neural Operator: Graph Kernel Network for Partial Differential Equations		
	publication_date	2020-02-26 00:00:00	publication_date	2020-03-07 00:00:00		
	source	SupportedSources.SEMANTIC_SCHOLAR	source	SupportedSources.INTERNET_ARCHIVE		
	journal	ArXiv	journal			
	volume	abs/2003.03485	volume			
	doi		doi			
	urls	<ul style="list-style-type: none"><li>• <a href="https://www.semanticscholar.org/paper/d407abcdf8b5ce6dbf9b9ab56357f4673676f951">https://www.semanticscholar.org/paper/d407abcdf8b5ce6dbf9b9ab56357f4673676f951</a></li></ul>	urls	<ul style="list-style-type: none"><li>• <a href="https://web.archive.org/web/20200927061105/https://arxiv.org/pdf/2003.03485v1.pdf">https://web.archive.org/web/20200927061105/https://arxiv.org/pdf/2003.03485v1.pdf</a></li></ul>		
	id	id-8303098874606084460	id	id-224681390603207089		
	abstract	The classical development of neural networks has been primarily for mappings between a finite-dimensional Euclidean space and a set of classes, or between two finite-dimensional Euclidean spaces. The purpose of this work is to generalize neural networks so that they can learn mappings between infinite-dimensional spaces (operators). The key innovation in our work is that a single set of network parameters, within a carefully designed network architecture, may be used to describe mappings between infinite-dimensional spaces and between different finite-dimensional approximations of those spaces. We formulate approximation of the infinite-dimensional mapping by composing nonlinear activation functions and a class of integral operators. The kernel integration is computed by message passing on graph networks. This approach has substantial practical consequences which we will illustrate in the context of mappings between input data to partial differential equations (PDEs) and their solutions. In this context, such learned networks can generalize among different approximation methods for the PDE (such as finite difference or finite element methods) and among approximations corresponding to different underlying levels of resolution and discretization. Experiments confirm that the proposed graph kernel network does have the desired properties and show competitive performance compared to the state of the art solvers.	abstract	The classical development of neural networks has been primarily for mappings between a finite-dimensional Euclidean space and a set of classes, or between two finite-dimensional Euclidean spaces. The purpose of this work is to generalize neural networks so that they can learn mappings between infinite-dimensional spaces (operators). The key innovation in our work is that a single set of network parameters, within a carefully designed network architecture, may be used to describe mappings between infinite-dimensional spaces and between different finite-dimensional approximations of those spaces. We formulate approximation of the infinite-dimensional mapping by composing nonlinear activation functions and a class of integral operators. The kernel integration is computed by message passing on graph networks. This approach has substantial practical consequences which we will illustrate in the context of mappings between input data to partial differential equations (PDEs) and their solutions. In this context, such learned networks can generalize among different approximation methods for the PDE (such as finite difference or finite element methods) and among approximations corresponding to different underlying levels of resolution and discretization. Experiments confirm that the proposed graph kernel network does have the desired properties and show competitive performance compared to the state of the art solvers.		
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