cases	doc_1		doc_2		decision	id
	authors	• S. Hamid Rezatofighi • Roman Kaskman • Farbod T. Motlagh • Qinfeng Shi, Daniel Cremers • Laura Leal-TaixÃ© • Ian Reid	**authors**	• S. Hamid Rezatofighi • Roman Kaskman • Farbod T. Motlagh • Qinfeng Shi • Daniel Cremers • Laura Leal-TaixÃ© • Ian Reid	DUPLICATES	30
	title	Deep Perm-Set Net: Learn to predict sets with unknown permutation and cardinality using deep neural networks	**title**	Deep Perm-Set Net: Learn to predict sets with unknown permutation and cardinality using deep neural networks		
	publication_date	2018-10-02 00:00:00	**publication_date**	2018-05-02 03:49:39+00:00		
	source	SupportedSources.INTERNET_ARCHIVE	**source**	SupportedSources.ARXIV		
	journal		**journal**	None		
	volume		**volume**			
	doi		**doi**			
	urls	• https://web.archive.org/web/20191016181610/https://arxiv.org/pdf/1805.00613v4.pdf	**urls**	• http://arxiv.org/pdf/1805.00613v4 • http://arxiv.org/abs/1805.00613v4 • http://arxiv.org/pdf/1805.00613v4		
	id	id-7131999680344154908	**id**	id-4060987410499256380		
	abstract	Many real-world problems, e.g. object detection, have outputs that are naturally expressed as sets of entities. This creates a challenge for traditional deep neural networks which naturally deal with structured outputs such as vectors, matrices or tensors. We present a novel approach for learning to predict sets with unknown permutation and cardinality using deep neural networks. Specifically, in our formulation we incorporate the permutation as unobservable variable and estimate its distribution during the learning process using alternating optimization. We demonstrate the validity of this new formulation on two relevant vision problems: object detection, for which our formulation outperforms state-of-the-art detectors such as Faster R-CNN and YOLO, and a complex CAPTCHA test, where we observe that, surprisingly, our set based network acquired the ability of mimicking arithmetics without any rules being coded.	**abstract**	Many real-world problems, e.g. object detection, have outputs that are naturally expressed as sets of entities. This creates a challenge for traditional deep neural networks which naturally deal with structured outputs such as vectors, matrices or tensors. We present a novel approach for learning to predict sets with unknown permutation and cardinality using deep neural networks. Specifically, in our formulation we incorporate the permutation as unobservable variable and estimate its distribution during the learning process using alternating optimization. We demonstrate the validity of this new formulation on two relevant vision problems: object detection, for which our formulation outperforms state-of-the-art detectors such as Faster R-CNN and YOLO, and a complex CAPTCHA test, where we observe that, surprisingly, our set based network acquired the ability of mimicking arithmetics without any rules being coded.		
	versions		**versions**			