	doc_1	doc_2	decision	id
cases			DUPLICATES	3

	doc_1
authors	• Jarrod Haas • William Yolland • Bernhard Rabus
title	Linking Neural Collapse and L2 Normalization with Improved Out-of-Distribution Detection in Deep Neural Networks
publication_date	2023-01-11 00:00:00
source	SupportedSources.INTERNET_ARCHIVE
journal	
volume	
doi	
urls	• https://web.archive.org/web/20230115170908/https://arxiv.org/pdf/2209.08378v3.pdf
id	id1331377022105942906
abstract	We propose a simple modification to standard ResNet architectures--L2 normalization over feature space--that substantially improves out-of-distribution (OoD) performance on the previously proposed Deep Deterministic Uncertainty (DDU) benchmark. We show that this change also induces early Neural Collapse (NC), an effect linked to better OoD performance. Our method achieves comparable or superior OoD detection scores and classification accuracy in a small fraction of the training time of the benchmark. Additionally, it substantially improves worst case OoD performance over multiple, randomly initialized models. Though we do not suggest that NC is the sole mechanism or a comprehensive explanation for OoD behaviour in deep neural networks (DNN), we believe NC's simple mathematical and geometric structure can provide a framework for analysis of this complex phenomenon in future work.
versions	

	doc_2
authors	• Jarrod Haas • William Yolland • Bernhard Rabus
title	Linking Neural Collapse and L2 Normalization with Improved Out-of-Distribution Detection in Deep Neural Networks
publication_date	2022-09-17 17:46:06+00:00
source	SupportedSources.ARXIV
journal	None
volume	
doi	
urls	• http://arxiv.org/pdf/2209.08378v3 • http://arxiv.org/abs/2209.08378v3 • http://arxiv.org/pdf/2209.08378v3
id	id-8062065306098451572
abstract	We propose a simple modification to standard ResNet architectures--L2 normalization over feature space--that substantially improves out-of-distribution (OoD) performance on the previously proposed Deep Deterministic Uncertainty (DDU) benchmark. We show that this change also induces early Neural Collapse (NC), an effect linked to better OoD performance. Our method achieves comparable or superior OoD detection scores and classification accuracy in a small fraction of the training time of the benchmark. Additionally, it substantially improves worst case OoD performance over multiple, randomly initialized models. Though we do not suggest that NC is the sole mechanism or a comprehensive explanation for OoD behaviour in deep neural networks (DNN), we believe NC's simple mathematical and geometric structure can provide a framework for analysis of this complex phenomenon in future work.
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