

Polarity Is All You Need to Learn and Transfer Faster

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The Fortieth International Conference on Machine Learning, Honolulu

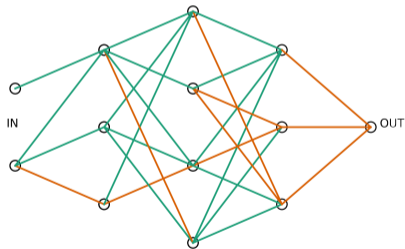


Learning efficiency gap between NI and AI

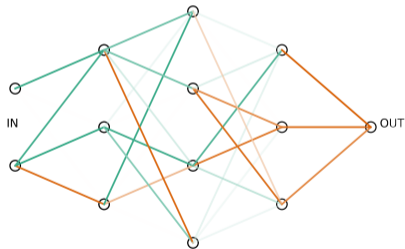
Intelligence	Learning efficiency		
Natural	Fast, a few samples		
Artificial	GPUs/TPUs, huge datasets		

Learning efficiency gap between NI and AI

Intelligence	Learning efficiency	Knowledge medium	
Natural	Fast, a few samples	Polarity	
Artificial	GPUs/TPUs, huge datasets	Polarity + Magnitude	



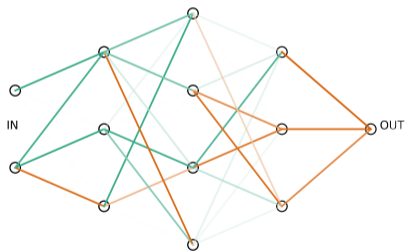
Natural Intelligence



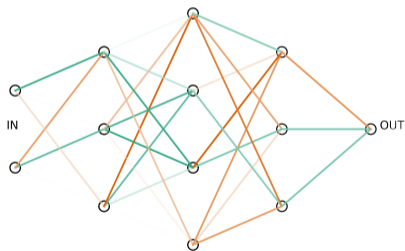
Artificial Intelligence

Learning efficiency gap between NI and AI

Intelligence	Learning efficiency	Knowledge medium	Weight dynamic
Natural	Fast, a few samples	Polarity	Polarity fixed
Artificial	GPUs/TPUs, huge datasets	Polarity + Magnitude	Polarity flexible



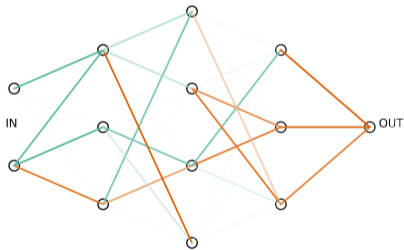
Natural Intelligence



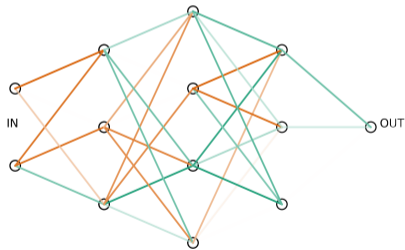
Artificial Intelligence

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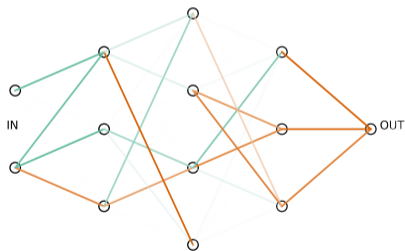
Natural Intelligence



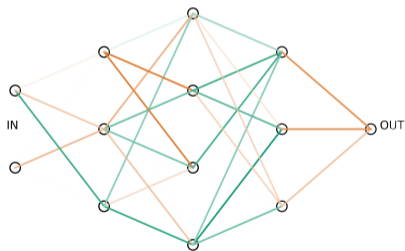
Artificial Intelligence

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Natural Intelligence



Artificial Intelligence

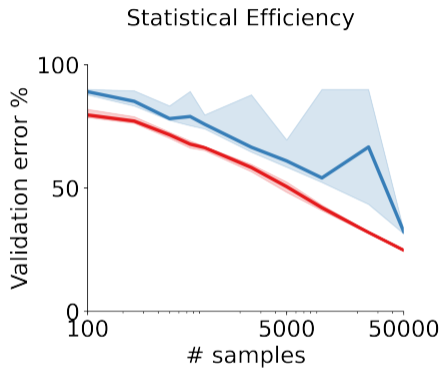
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Lemma (capacity-speed trade-off)

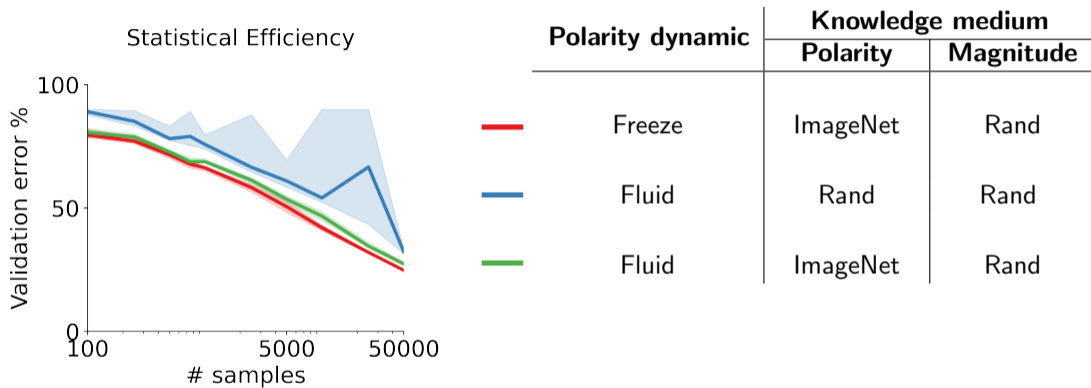
If the weight polarities are set a priori, such that the function is still representable, then the network can learn faster.

Polarity is all you need to learn faster



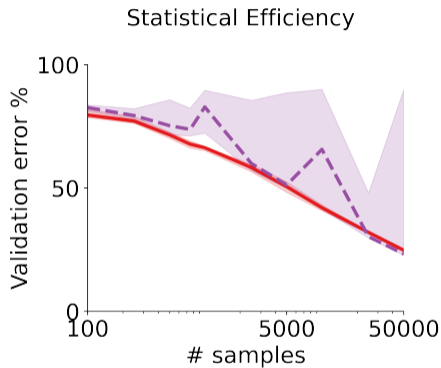
Polarity dynamic	Knowledge medium	
	Polarity	Magnitude
Freeze	ImageNet	Rand
Fluid	Rand	Rand

Polarity is all you need to learn faster



1. If weight polarities are adequately set *a priori*, then networks learn with less time and data.

Polarity is all you need to learn and transfer faster



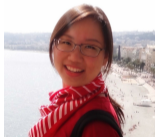
Polarity dynamic	Knowledge medium	
	Polarity	Magnitude
Freeze	ImageNet	Rand
Fluid	ImageNet	ImageNet

1. If weight polarities are adequately set *a priori*, then networks learn with less time and data.
2. Polarity may be a more effective and compressed medium of network knowledge transfer.

Find out more in our paper and poster session!



Poster: July 25 11 am HST. Exhibit Hall 1 #613.



NEURODATA

Funding: NSF CAREER, NSF NEURONEX, NSF AI Institute Planning Award, NSF THEORINET