

# Relearn Analysis

## Relearn: connectivity\_update()

		<i>model</i>	<i>total cost</i>
sparse	<b><i>Cheap 25 (full matrix)</i></b>	$+ -2216.84 + 325.891 \cdot \log_2^1(p) + 0.0010582 \cdot (\text{size}^1) \cdot \log_2^2(\text{size})$	8150627.49
	<b><i>Cheap base</i></b>	$+ -1140.63 + 228.555 \cdot \log_2^1(p) + 0.000535977 \cdot (\text{size}^1) \cdot \log_2^2(\text{size})$	1196503.07
	<b><i>Cheap +1</i></b>	$+ -1146.56 + 228.876 \cdot \log_2^1(p) + 0.000537703 \cdot (\text{size}^1) \cdot \log_2^2(\text{size})$	1242218.14
	<b><i>Expensive 25 (full matrix)</i></b>	$+ -1869.02 + 325.891 \cdot \log_2^1(p) + 0.00015761 \cdot (\text{size}^{1.75})$	8150627.49
	<b><i>Expensive base</i></b>	$+ -3289.11 + 427.568 \cdot \log_2^1(p) + 0.000240677 \cdot (\text{size}^{1.75})$	5677770.02
	<b><i>Expensive +1</i></b>	$+ -2003.25 + 329.008 \cdot \log_2^1(p) + 0.000169668 \cdot (\text{size}^{1.75})$	5690767.81
	<b><i>Cheap +2</i></b>	$+ -1156.99 + 229.691 \cdot \log_2^1(p) + 0.000545923 \cdot (\text{size}^1) \cdot \log_2^2(\text{size})$	1297888.29

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	<i>Expensive +2</i>	$+ -1851.46 + 316.306 \cdot \log_2^1(p) + 0.000162782 \cdot (\text{size}^{1.75})$	5707071.49
normal	<i>full matrix</i>	$+ -2216.84 + 325.891 \cdot \log_2^1(p) + 0.0010582 \cdot (\text{size}^1) \cdot \log_2^2(\text{size})$	8150627.49

**Conclusion: We get the same result as before but with 86% reduced modeling costs!**

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<b>percent cost</b>	<b>RSS</b>	<b>Adj. <math>R^2</math></b>	<b>SMAPE</b>	<b>RE</b>	<b>Comments</b>
100.00	398000.00	0.95			<i>The sparse modeler comes to the same result with the cheapest base points and all additional points as the old modeler.</i>
14.68	12400.00	0.98			<i>It looks like that for relearn we do not need any additional points to get an accurate model. But the base points do change the model. The question is which model is the correct one?</i>
15.24	12800.00	0.98			<i>We come to the same result with only the cheapest base points with one additional point. All terms are modeled correctly only the coefficients are slightly different.</i>
100.00	402000.00	0.95			<i>When we take the most expensive points as base for the sparse model we get different results. The term for p stays the same but size has no logarithm and a different exponent.</i>
69.66	41900.00	0.98			
69.82	261000.00	0.91			<i>Same result as exp +1. The results show that the selection of the additional points is not so important. Though the selection of the base points is important and does heavily affect the model.</i>
15.92	13600.00	0.98			<i>Same result as cheap +1. Slightly different coefficients. Adding more points does not really improve the result but increases the cost.</i>

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70.02	280000.00	0.93			
100.00	398000.00	0.95			<i>Baseline result to compare against. Expected runtime should be: .</i>

Measurements

size	9000	834.353	1186.72	1877.45	2125.61	2535.05
	8000	721.454	1026.09	1640.74	1879.76	2135.01
	7000	616.449	869.846	1409.64	1623.84	1853.32
	6000	509.49	714.298	1169.15	1376.47	1557.19
	5000	406.181	574.101	939.328	1122.32	1276.17
		32	64	128	256	512
		p				

t = 0.1

size = c\*p