The subject of previous midterm draft is ‘applied LSTM to channel coding’. LSTM is an architecture of deep learning, a method applied to reduce complexity by applying it. So I tried to make it easy to implement through a ‘library’ created by nvdia called ‘siona’.

But what I want to change(subject) is a method called pruning, which improves complexity as the previous method, but it is an algorithmic method, not a specific architecture.

Set the weight value at the position of 1 in the parity check matrix, respectively. The weight value represents the importance of the decoding process, So I reduce amount of computation by removing less than specific value criterion, and I want to improve the complexity through it.

Midterm : I proposed a method to improve complexity through LSTM, an architecture that improves the problem of RNN, a method previously applied.

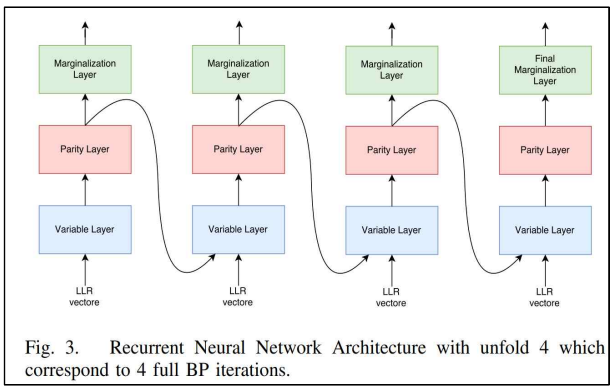

Fig. 3. Recurrent Neural Network Architecture with unfold 4 which correspond to 4 full BP iterations.

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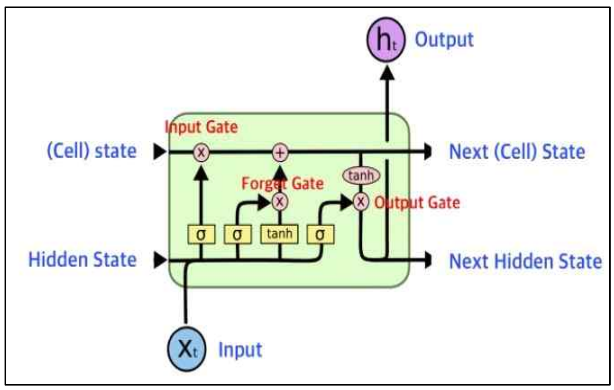

left(prior research) : Nachmani, Eliya, et al. "RNN decoding of linear block codes."*arXiv preprint arXiv:1702.07560*(2017).

right : lstm(Architecture I want to apply)
new subject : a method of improving complexity by reducing the amount of computation through an algorithm called pruning.

H

1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	1	1	1	1	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1

-> set weight : position ‘1’

0.001749	0.001749	0.001749	-0.45493	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	-0.66459	-0.33558	-0.33558	-0.33558	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0.175457	0.175457	0.175457	-0.97437	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	-0.2234	-0.2234	-0.2234	-0.30622

-> remove $x \leq -0.4$

0.001749	0.001749	0.001749	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	-0.33558	-0.33558	-0.33558	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0.175457	0.175457	0.175457	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	-0.2234	-0.2234	-0.2234	-0.30622