

# A Tale of Five Decoders.

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# Introduction

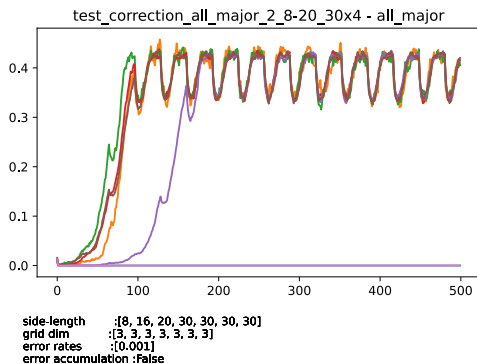
## Today:

- ▶ Noisy Circuits.
- ▶ Definitions and Motivation.
- ▶ Pippenger Construction. (Classical, Fault Tolerance with constant overhead at depth ).
- ▶ 'Franch-line' works, modern fault tolerance methods and gadgets. ('log n' overhead at depth).
- ▶ An almost  $\mathbf{QNC}_1 = \text{noisy-}\mathbf{QNC}_1$  .
- ▶ Next week, directions and hints that might show separation. ( $\neq$ ).

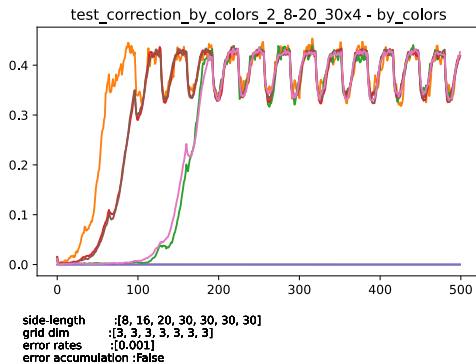
## TAKEAWAYS:

- ▶ More about codes.
- ▶ First view to fault tolerance.
- ▶ Nice open problems.

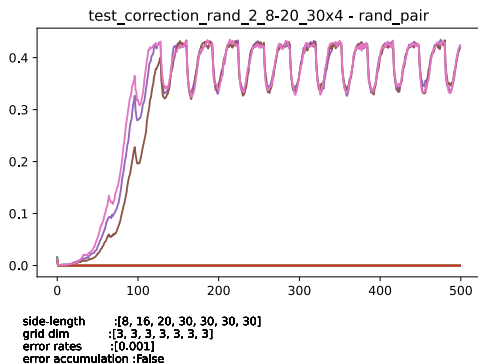
# Nosiy Circuit.



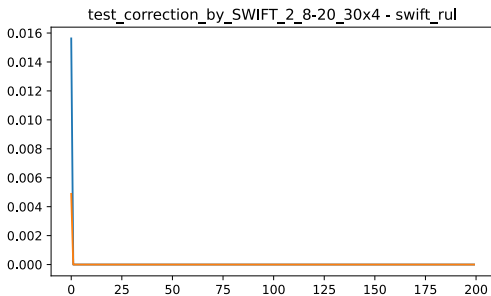
# Nosiy Circuit.



# Nosiy Circuit.

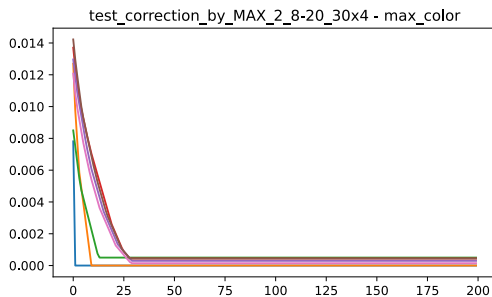


# Nosiy Circuit.



side-length :[8, 16, 20, 30, 30, 30, 30, 30]  
grid dim :[3, 3, 3, 3, 3, 3, 3]  
error rates :[0.001]  
error accumulation :False

# Nosiy Circuit.



side-length :[8, 16, 20, 30, 30, 30, 30, 30]  
grid dim :[3, 3, 3, 3, 3, 3, 3]  
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