No.

Date 28-08-2025

Nama : Della Marsela 3A

HLS (Autopilot) Results : Sphere Decoder

- Wireless MIMO Sphere Decoder
  - ~ 4000 lines of C code
  - Xilinx Virtex-5 at 225 MHz
- Compared to optimized IP
  - 11-31% better resource usage

Optimization III : Resources

- Allocation directive constrains resources
  - Operations
    - Number of adders instantiated RTL
    - Can save a lot of area
- Specify Implementation
  - Tag operator
  - Select core for this Mult

```
thisMult = b[i] * c[i];
a[i] = thisMult;
```

Core	Description
Mul	combinational mult
Mul_3s	3-stage pipelined mult
Mul_ns	HLS determine stages

Optimization IV : Loop Pipelining

```
Loop_tag: for(ii=1; ii<3; ii++){
  op_Read;      RD
  op_Compute;   CMP
  op_Write;     WR
```

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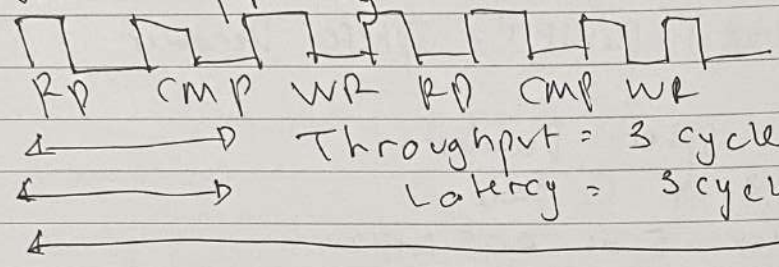
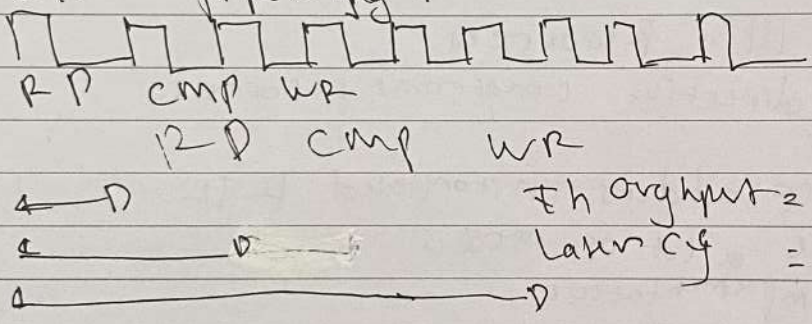
Without pipelining



With pipelining:



Transmission Map Estimation

- previous work:
  - Air light and transmission map are calculated after dark channel extraction
  - This method needs sorting task which is time-consuming and sensitive to the image size
- Estimating the air light map without sorting the dark channel pixels to minimize processing time.

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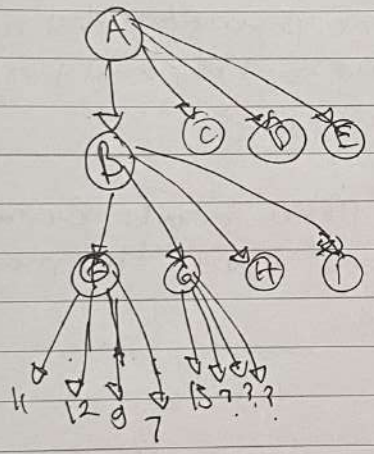
2.

A slight advance in technology can often lead to unpredictable consequences!

In the past, people believed that even the most powerful computers could never play chess - champion. In 1997 IBM's super computer Deep Blue defeated Garry Kasparov, the world chess champion.



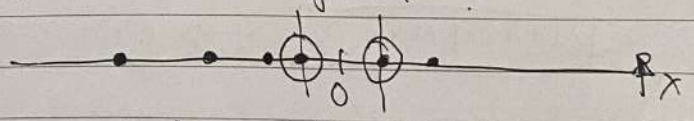
$4^n \to \infty$

lg x lg = 361

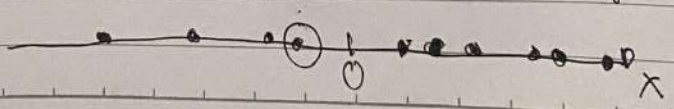
convert to a pattern recognition problem

Trans-forming a problem from one dimension into a higher dimensional space for analysis

- Data sets that are linearly separable work out great.



- But what if the dataset is just too hard?



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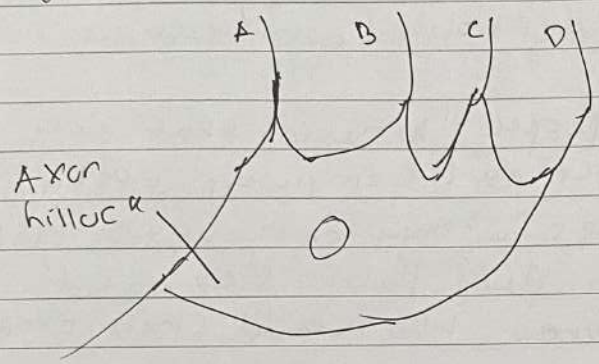
How neurons are connected



1. The combined post synaptic potentials did not surpass the firing threshold, and thus the neuron remained inactive.

2. The combined postsynaptic potentials surpass the firing threshold, and thus the neuron is in an excited state.

Why Deep ?

- Deep → Modularization