

CS 451 / 551 / ECE 541

ADVANCED  
COMPUTER ARCHITECTURE

SESSION no. 25

University of Idaho

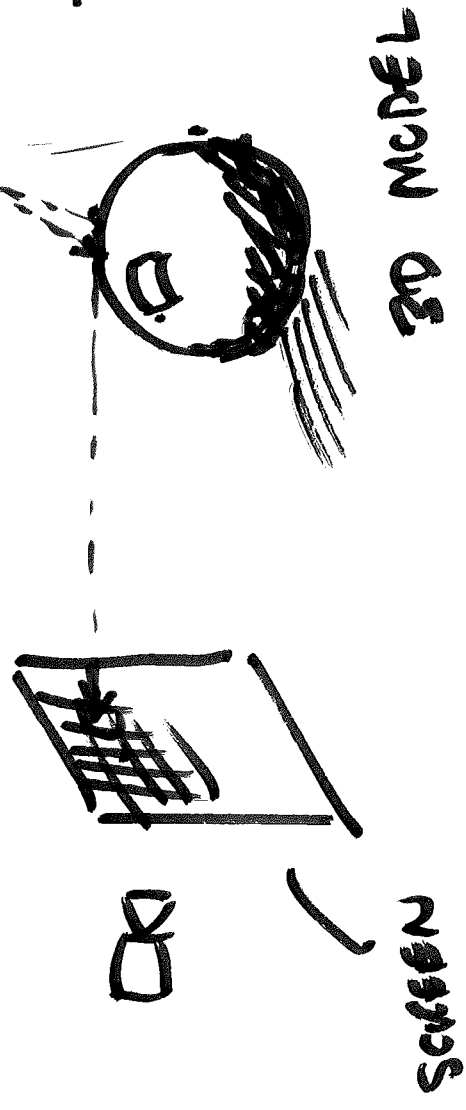
GRAPHICS PROCESSING UNITS

TEXT 4.4.

GRAPHICS → GPU

- VERY EFFICIENT
- MARKET DRIVEN
- GAMES, MOVIES
- LIGHT - CAD, VIS...

RAY TRACING

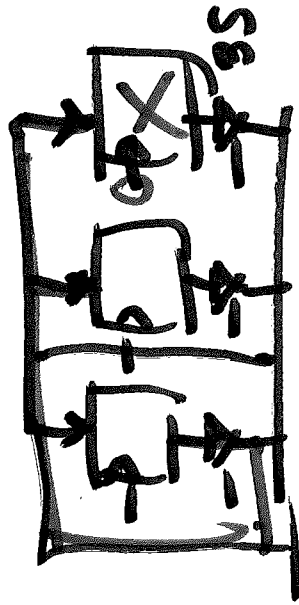


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THE ILLITERATE OF THE 21<sup>ST</sup> CENTURY  
WILL NOT BE THOSE WHO CANNOT READ  
AND WRITE, BUT THOSE WHO CANNOT  
LEARN, UNLEARN, AND RELEARN.

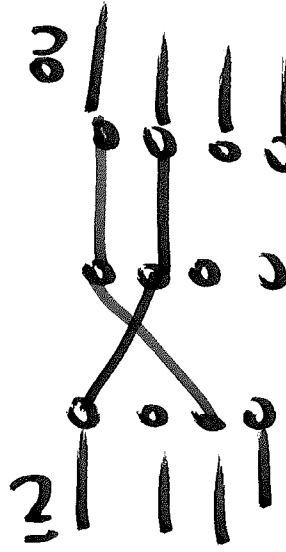
- ALVIN TOFFLER

BUS



ONE TALKER

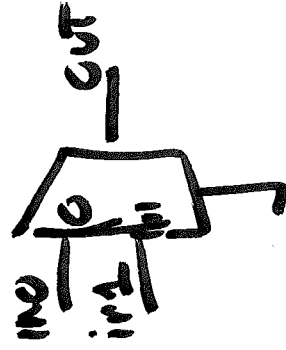
CROSSBAR



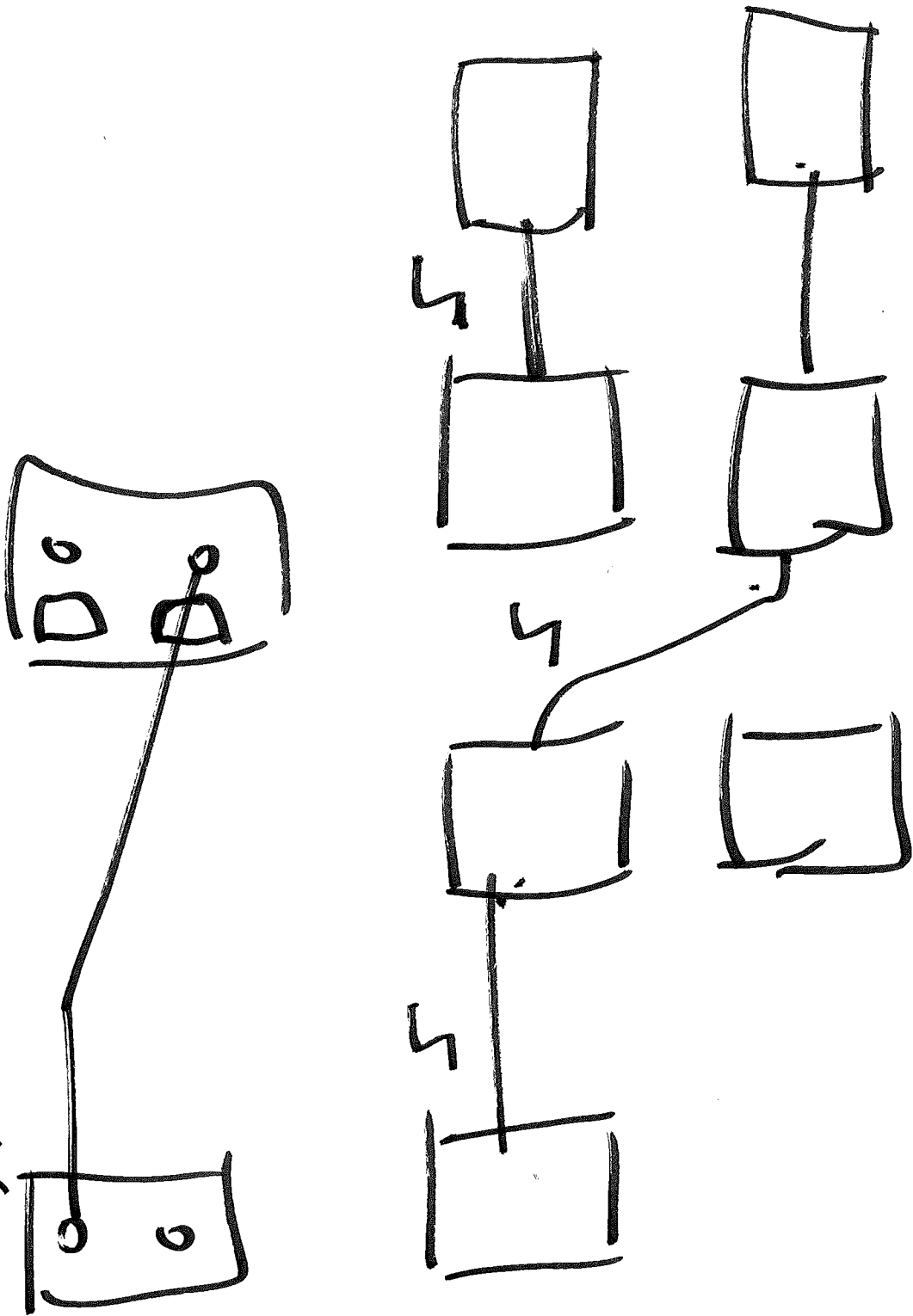
INDIVIDUAL ROUTING  
ADDRESS SEE

MULTIPLE TALKER

MUX



INFLEXIBLE



SYNCHRONOUS: ONE TRANSFER STEP  
PER CLOCK CYCLE

"Error-Resilient" Communication  
(Soft Error) Memory

HARD ERROR - NON RECOVERABLE FAILURE  
SOFT ERROR - TEMPORARY, RECOVERABLE  
FAILURE

SEU - SINGLE EVENT UPSET

FORWARD ERROR CORRECTION (FEC)  
· HAMMING CODES

ENCODE - STRATEGICALLY INTRODUCE  
REDUNDANCY

DECODE - CORRECT RANDOM ERRORS -  
RECONSTRUCT CORRECT SIGNAL

ENCODE: 1 0 1 1

3-MODULE REDUNDANCE

111 000 111 111



101 001 111 011



VOTE

1 0 1 1