

## NEW Algorithm parses & NEW "Space" Chip Accelerates thus "Rocket data!"

### Efficient Algorithms

### Speedy Memory Swapping

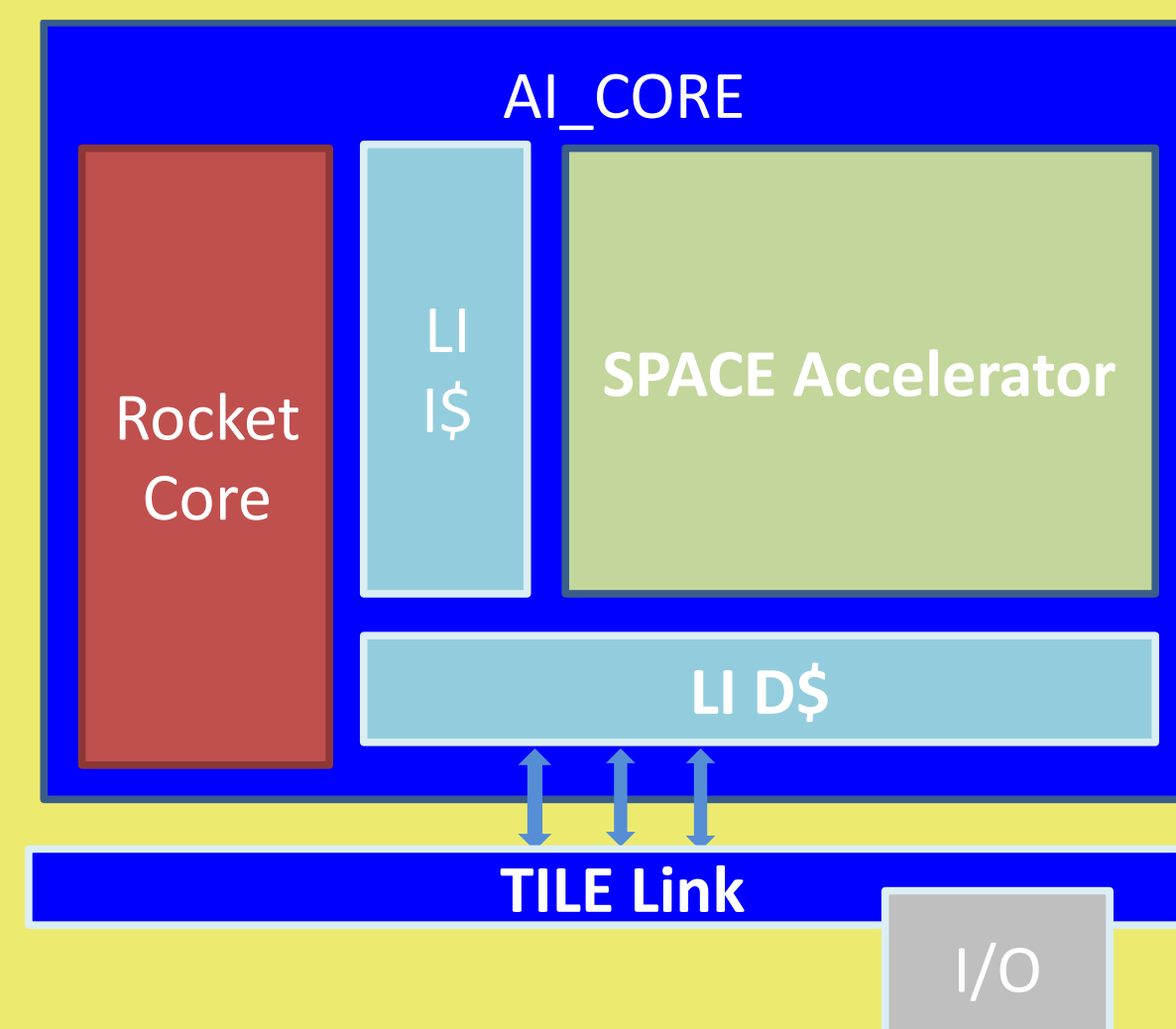
#### THREE COMPONENTS OF LEARNING ALGORITHMS<sup>[3]</sup>

Representation	Evaluation	Optimization
Instances	Accuracy/Error rate	Combinatorial optimization
<i>K</i> -nearest neighbor	Precision and recall	Greedy search
Support vector machines	Squared error	Beam search
Hyperplanes	Likelihood	Branch-and-bound
Naive Bayes	Posterior probability	Continuous optimization
Logistic regression	Information gain	Unconstrained
Decision trees	K-L divergence	Gradient descent
Sets of rules	Cost/Utility	Conjugate gradient
Propositional rules	Margin	Quasi-Newton methods
Neural networks		Constrained
		Linear programming
		Quadratic programming
Bayesian networks		
Conditional random fields		

#### RISC – V Processor<sup>[4]</sup>



#### Accelerator Memory<sup>[5]</sup>



I. Rocket Core with RISC-V processor

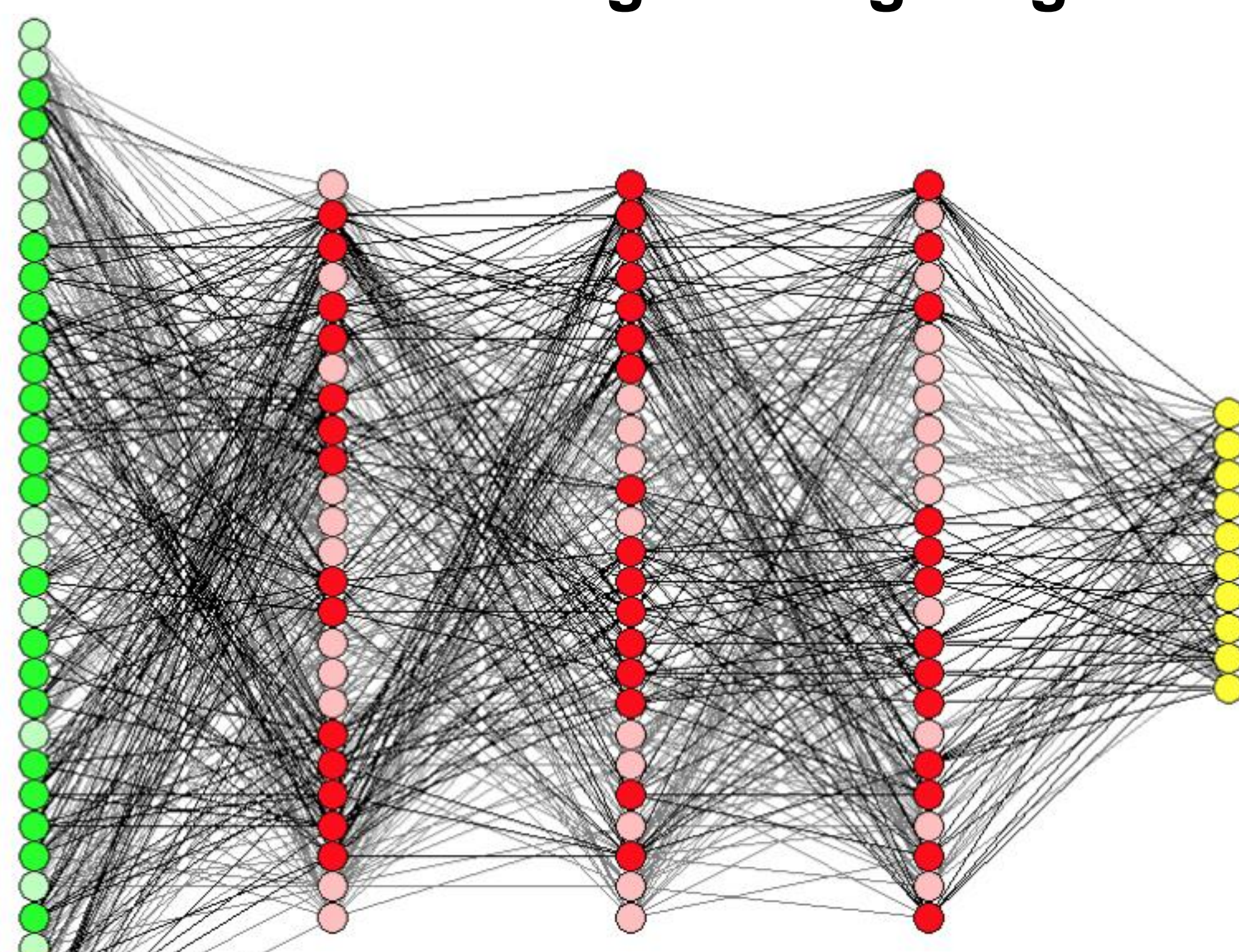
II. SPACE accelerator with 10 processing elements to accommodate a 4kx4k layer

III. Direct L1 data cache access for the accelerator and the processor

IV. ROCC interface between Rocket and the accelerator

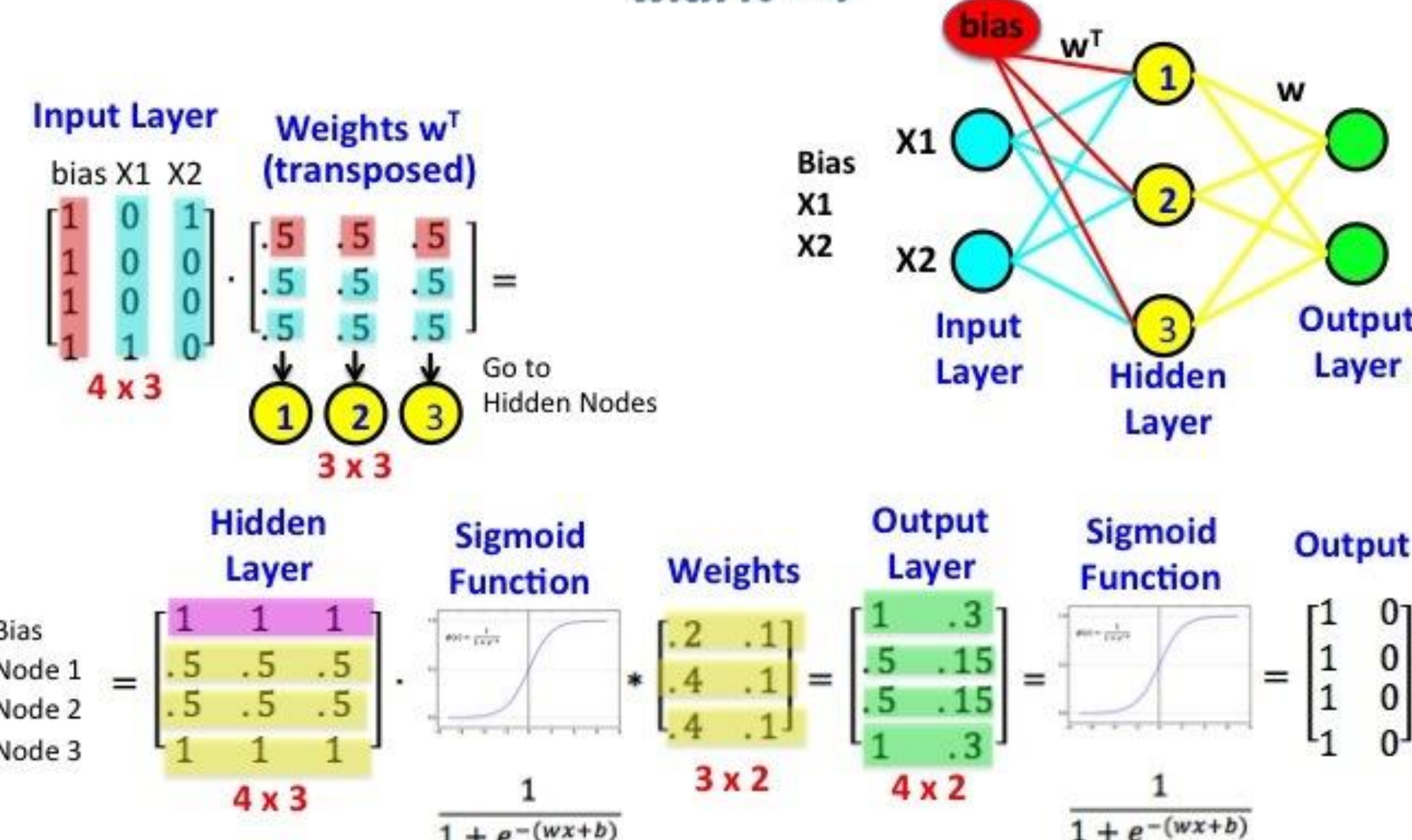
V. JTAG and 16bit serial I/O interface

#### Neural Networks advance through a weighting process



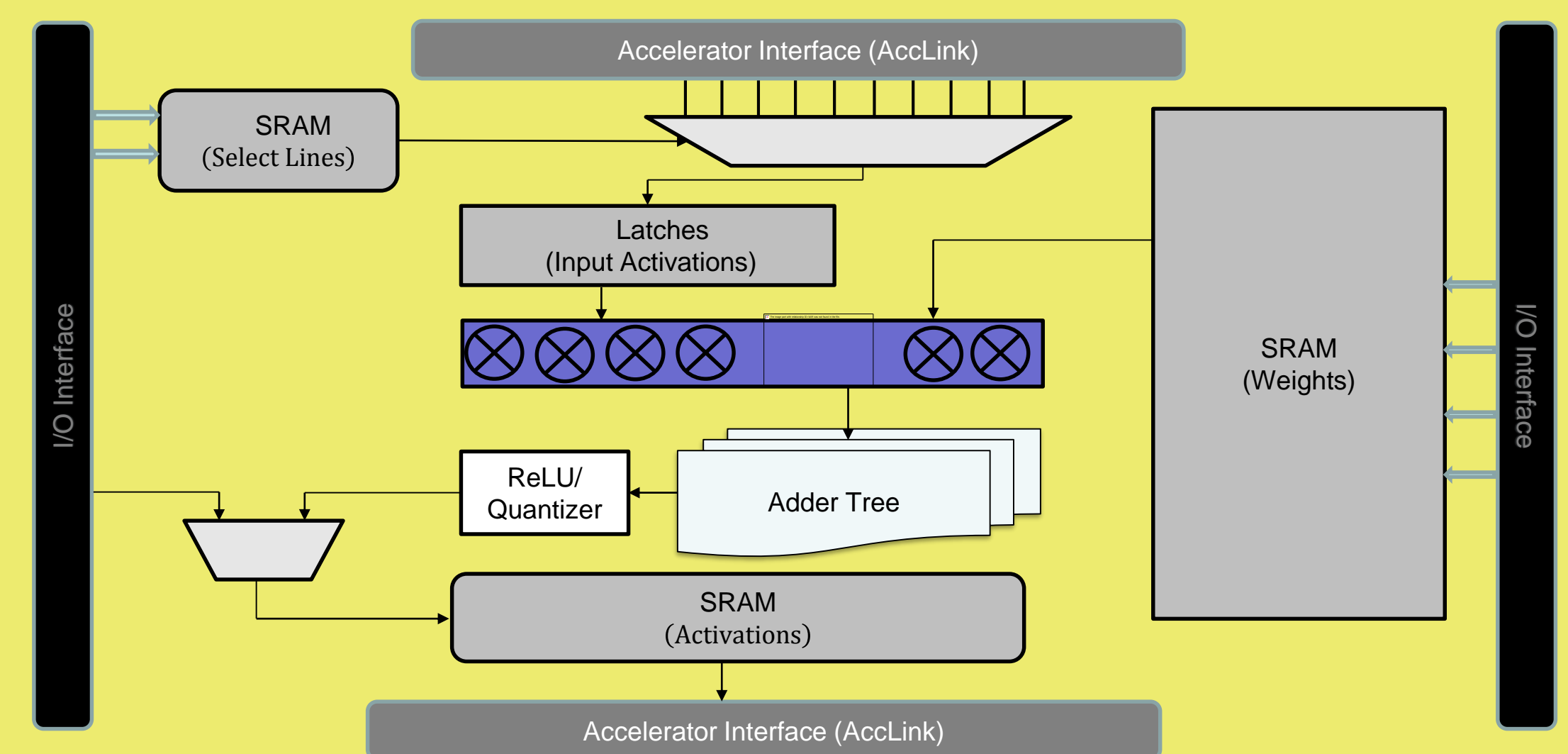
#### Neural Networks

#### Color Guided Matrix Multiplication for a Binary Classification Task with N = 4



#### Example of Backpropagation Algorithm<sup>[6]</sup>

#### Interface Connections<sup>[7]</sup>



#### References

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Transactions sift and compute large amounts of data rapidly...

...Using Matrix Multiplication