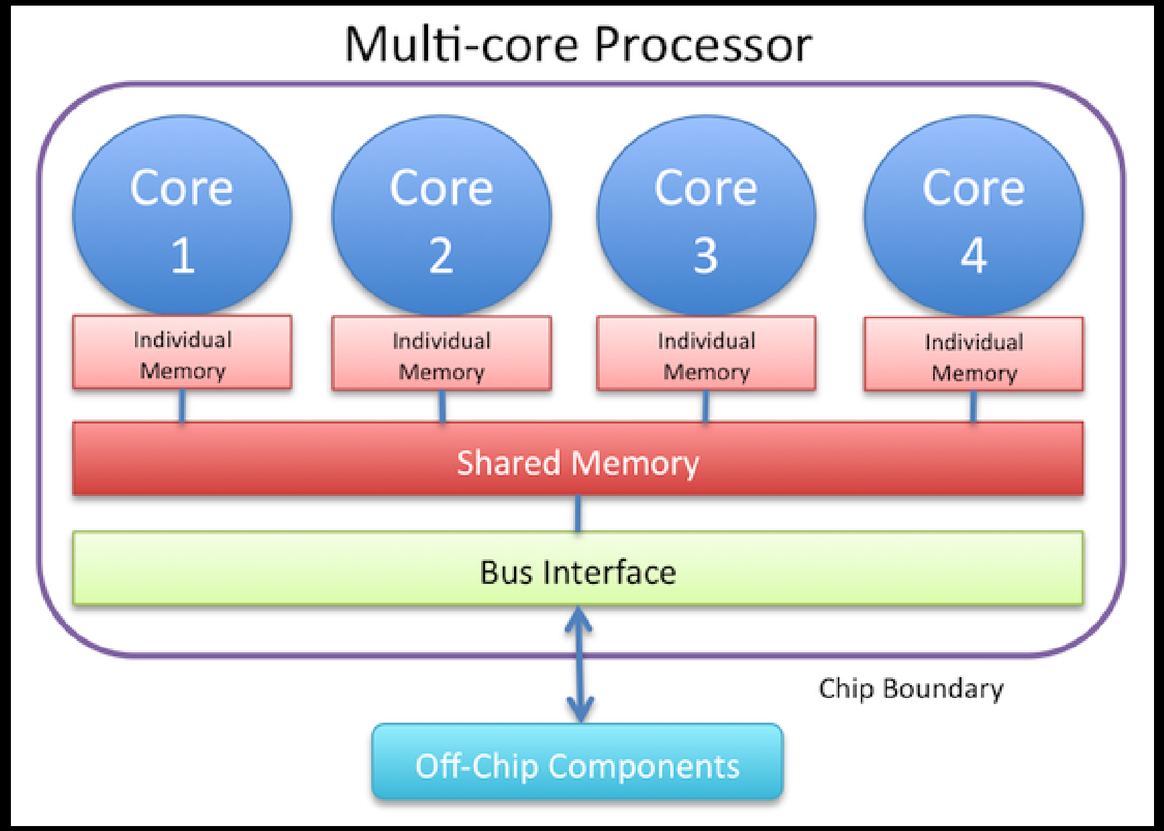
PARALLELISING ☹

CNNs

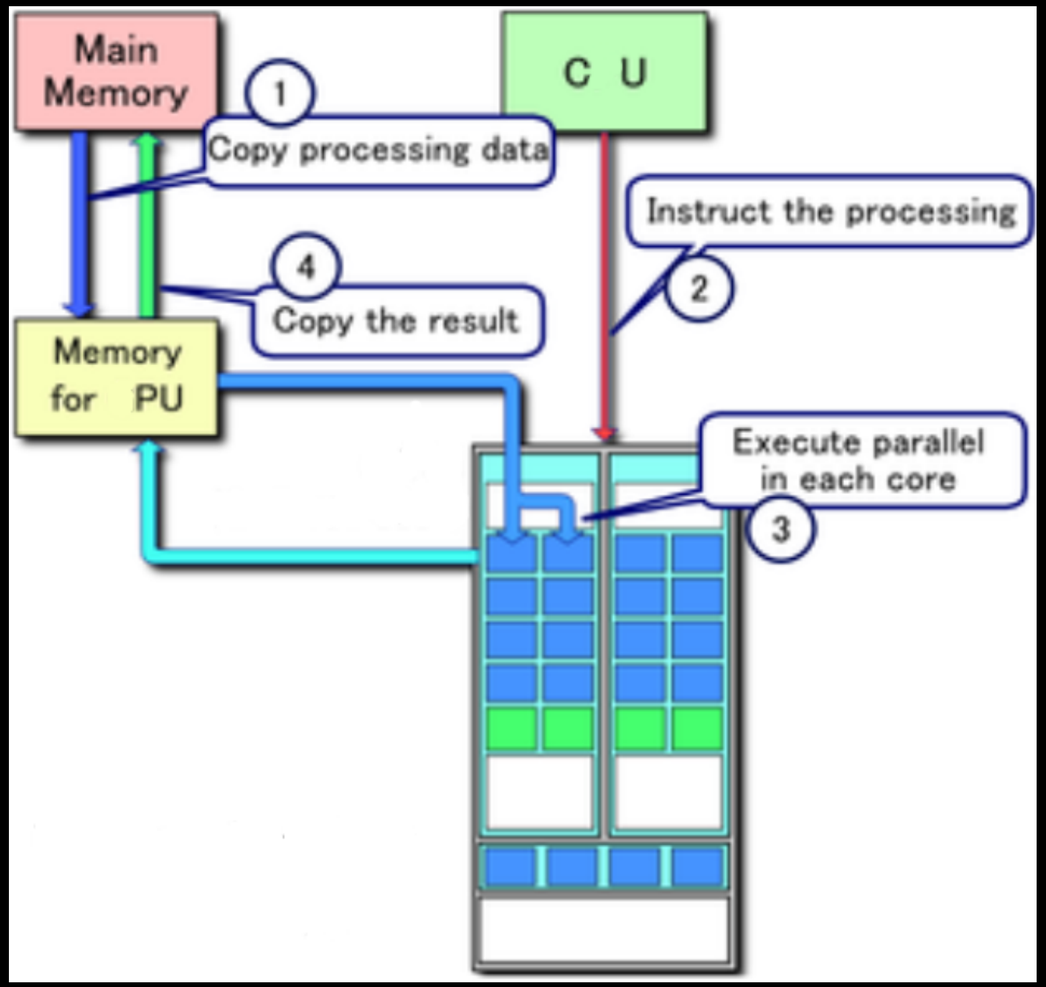
Achintya

Lohith

MULTI-CORE

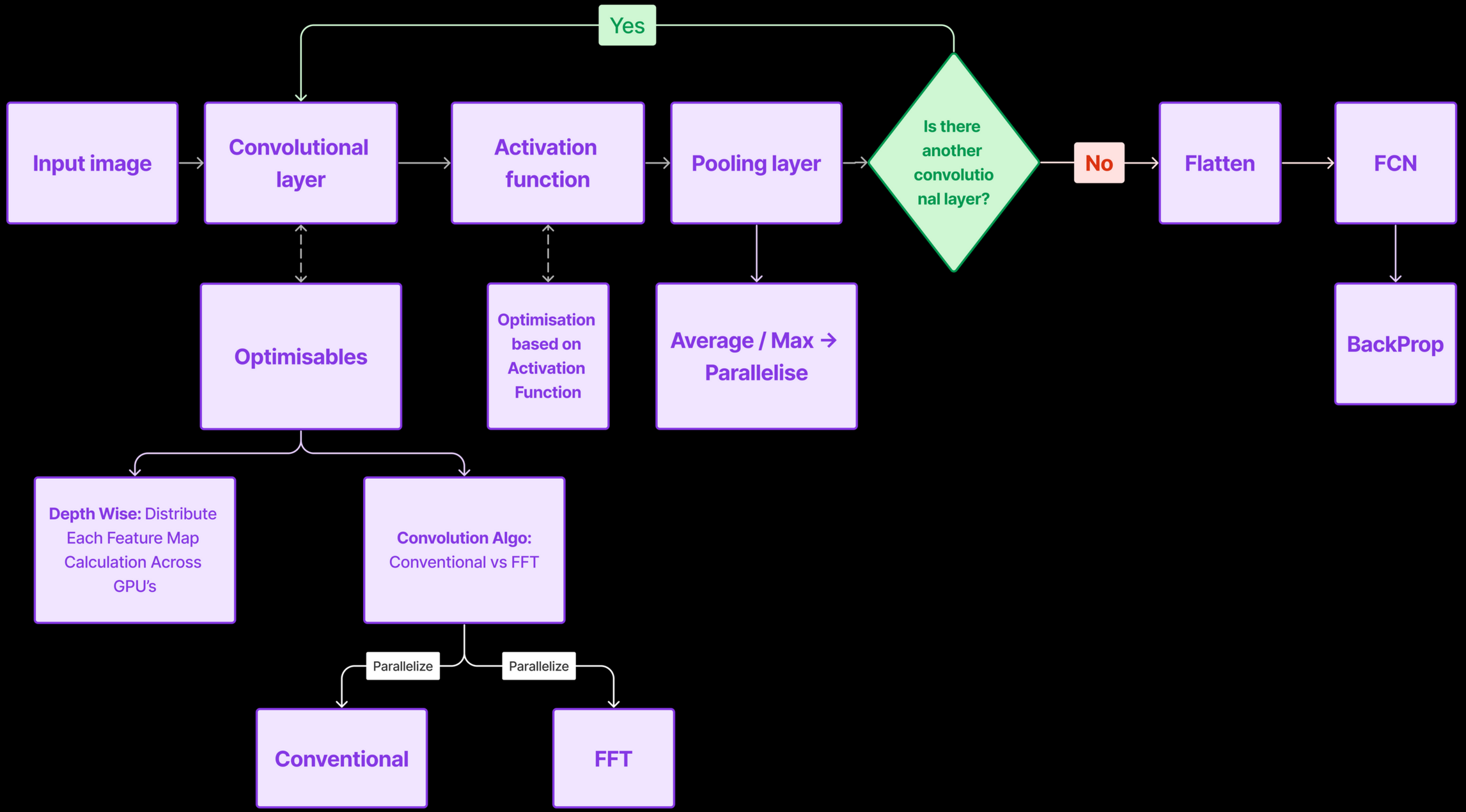


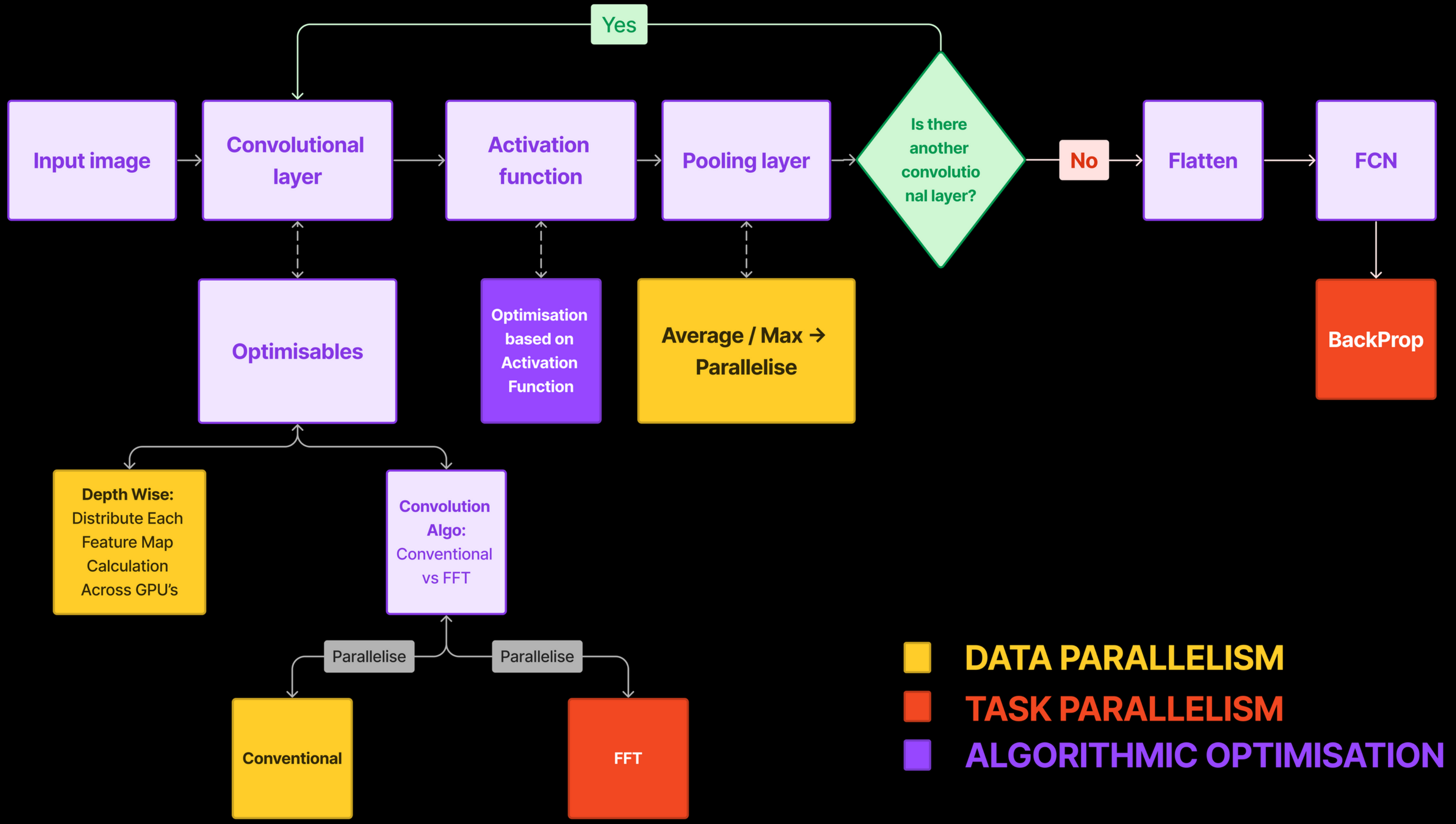
GPU

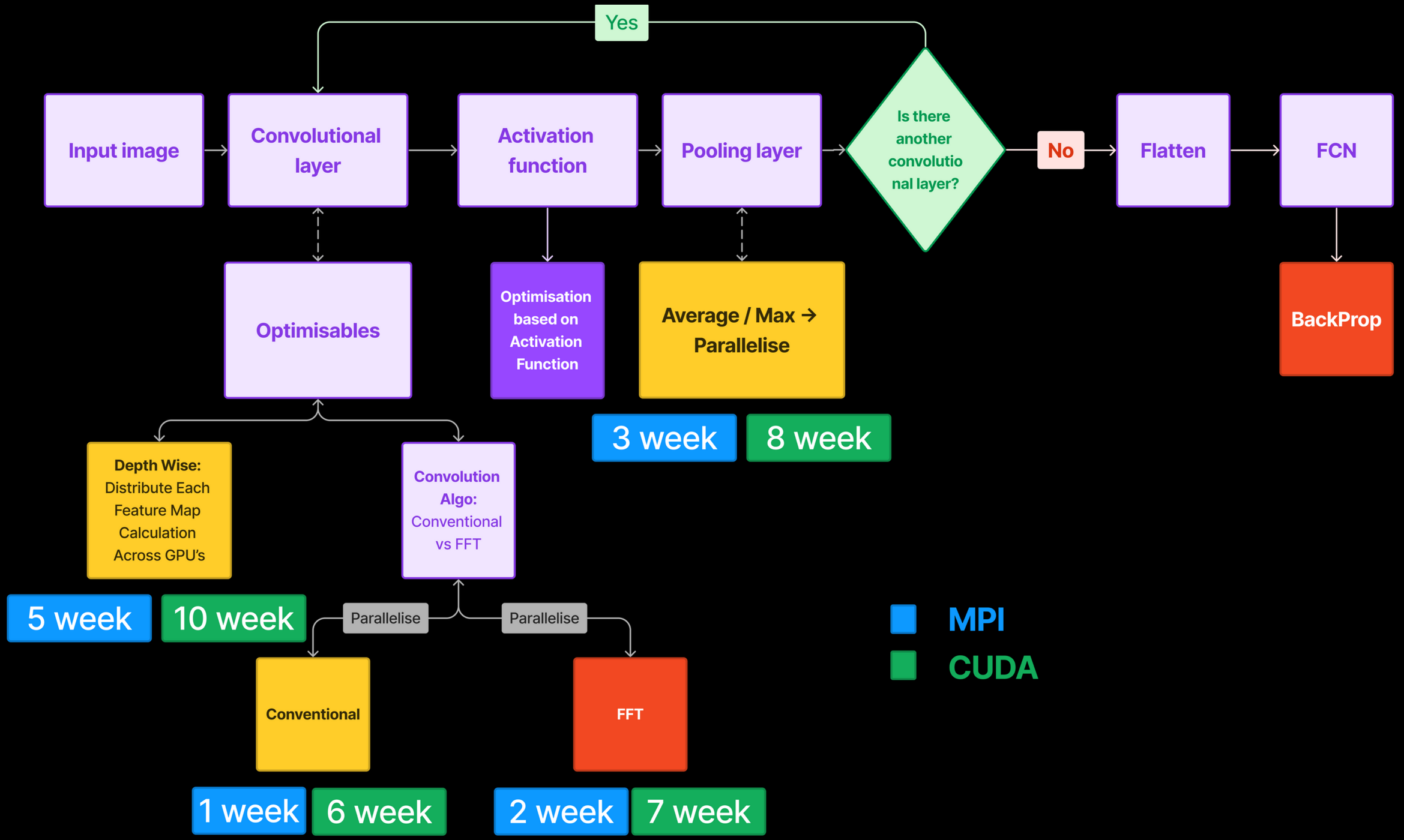


SIMD

BLOCK DIAGRAM




Yes
Input image
Convolutional layer
Activation function
Pooling layer
Is there another convolutional layer?
No
Flatten
FCN
BackProp
Optimisables
Optimisation based on Activation Function
Average / Max → Parallelise
Depth Wise: Distribute Each Feature Map Calculation Across GPU's
Convolution Algo: Conventional vs FFT
Parallelise
Parallelise
Conventional
FFT
DATA PARALLELISM
TASK PARALLELISM
ALGORITHMIC OPTIMISATION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Input image
Convolutional layer
Activation function
Pooling layer
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Flatten
FCN
BackProp
Optimisables
Optimisation based on Activation Function
Average / Max → Parallelise
3 week
8 week
Depth Wise: Distribute Each Feature Map Calculation Across GPU's
Convolution Algo: Conventional vs FFT
5 week
10 week
Parallelise
Parallelise
Conventional
FFT
1 week
6 week
2 week
7 week
MPI
CUDA

CHALLENGES

CONSISTENCY ACROSS PLATFORMS

SERIAL NATURE OF NN'S

MEMORY MANAGEMENT

SCALABILITY

LYF