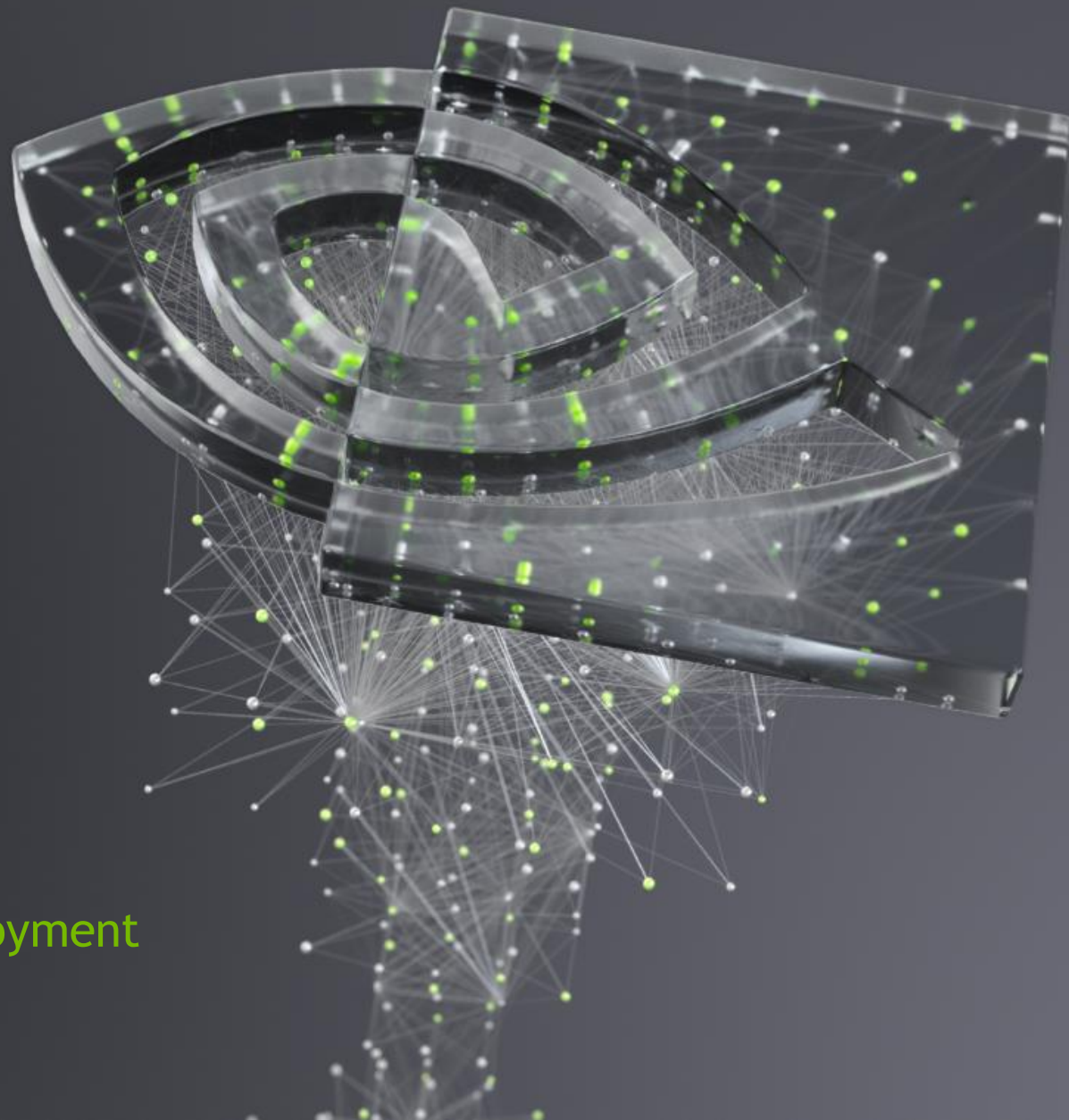




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FUNDAMENTALS OF DEEP LEARNING

Part 4: Data Augmentation and Deployment



AGENDA

Part 1: An Introduction to Deep Learning

Part 2: How a Neural Network Trains

Part 3: Convolutional Neural Networks

Part 4: Data Augmentation and Deployment

Part 5: Pre-trained Models

Part 6: Advanced Architectures

AGENDA – PART 4

- Data Augmentation
- Model Deployment

RECAP OF THE EXERCISE

Analysis

- CNN increased validation accuracy
- Still seeing training accuracy higher than validation

RECAP OF THE EXERCISE

Analysis

- CNN increased validation accuracy
- Still seeing training accuracy higher than validation

Solution

- Clean data provides better examples
- Dataset variety helps the model generalize





DATA AUGMENTATION

DATA AUGMENTATION



IMAGE FLIPPING

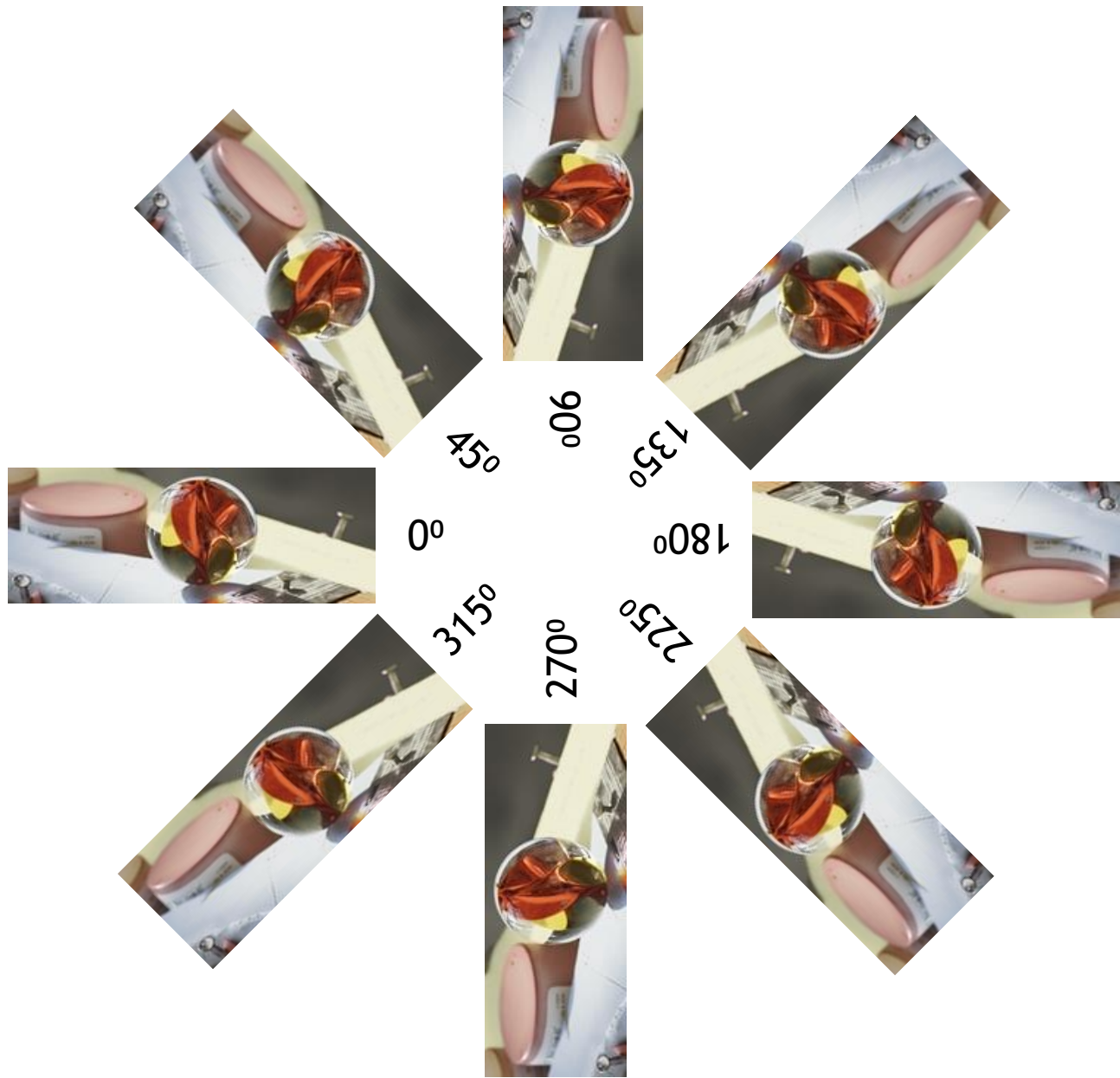
Horizontal Flip



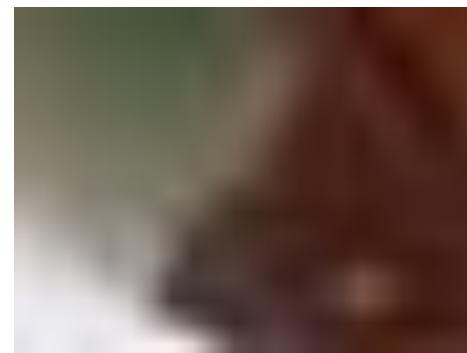
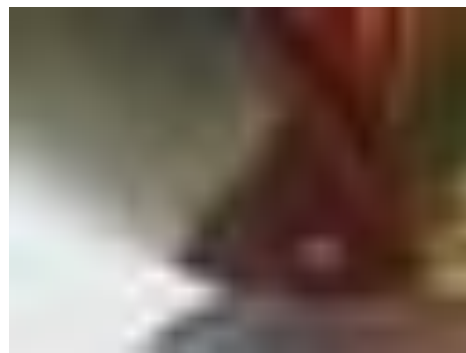
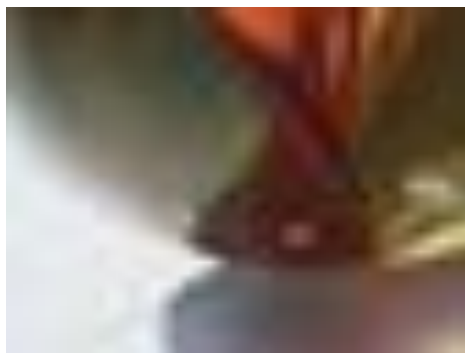
Vertical Flip



ROTATION



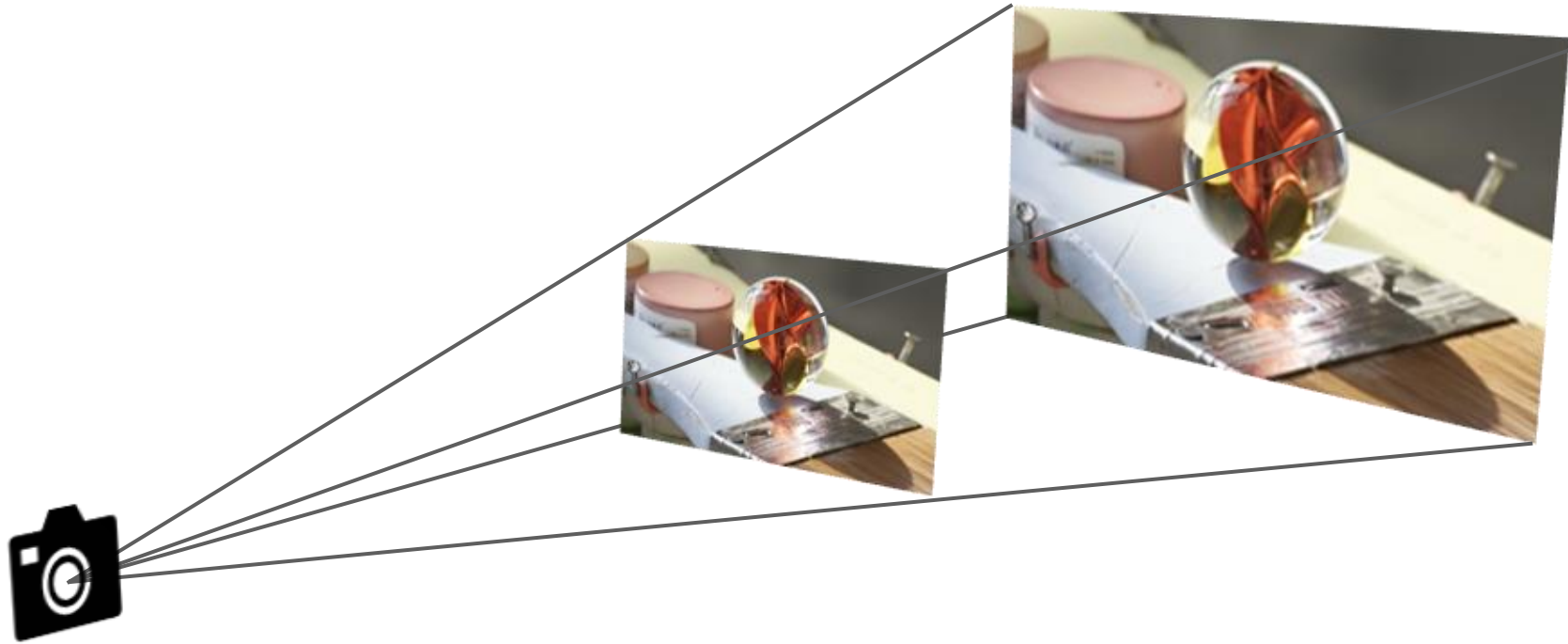
ZOOMING



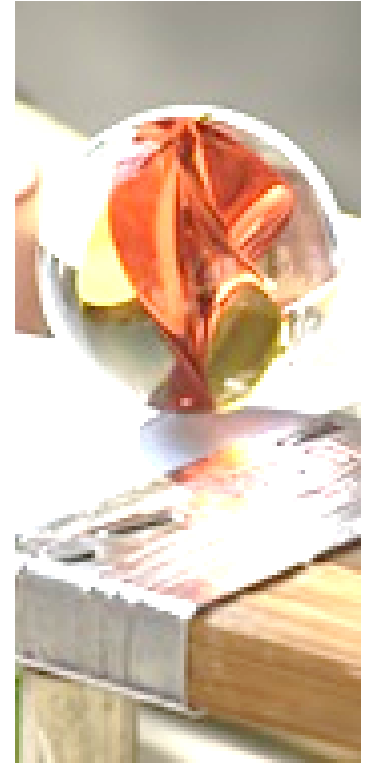
WIDTH AND HEIGHT SHIFTING



HOMOGRAPHY



BRIGHTNESS



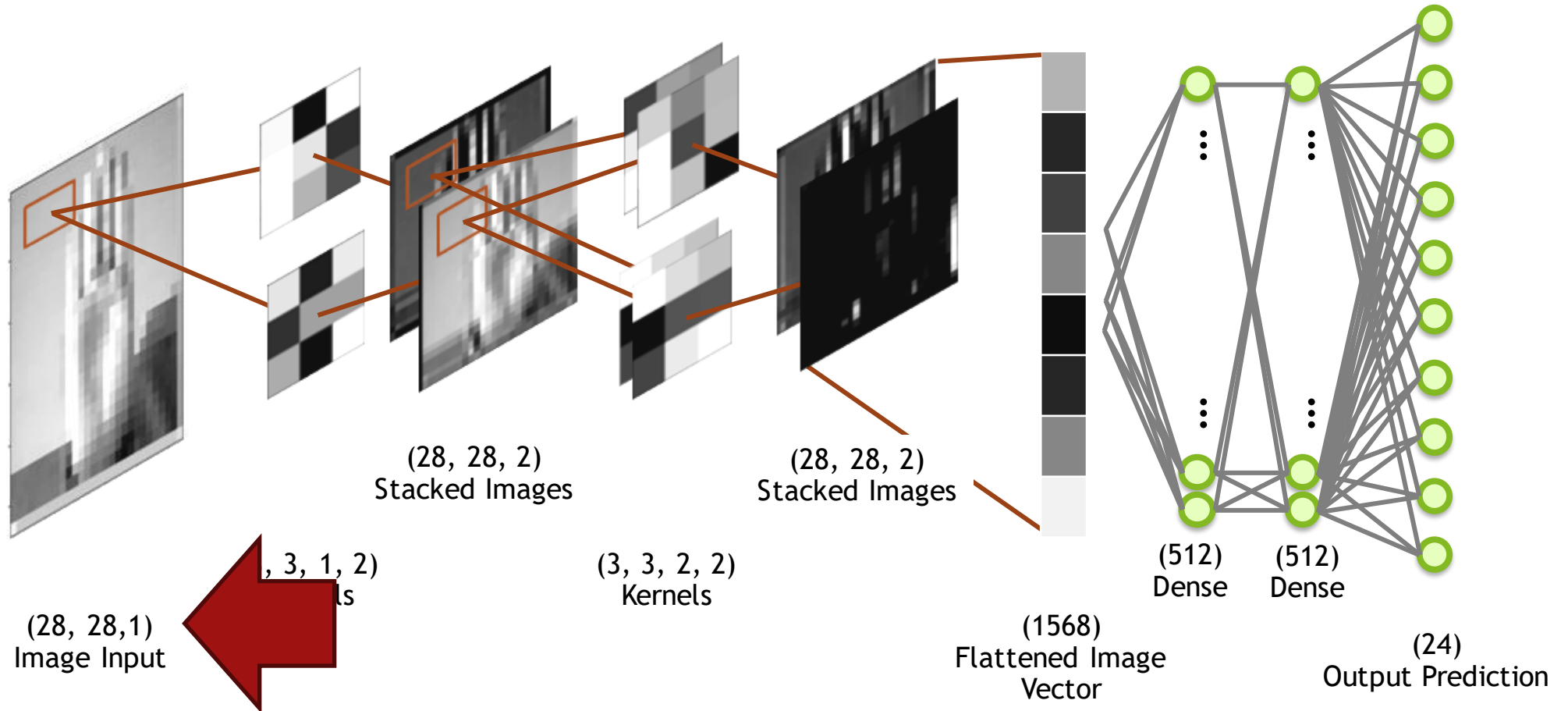
CHANNEL SHIFTING





MODEL DEPLOYMENT

MODEL DEPLOYMENT



MODEL DEPLOYMENT

Training
Batch Input



Convolution

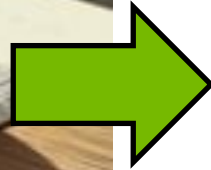
Max Pooling

...

MODEL DEPLOYMENT



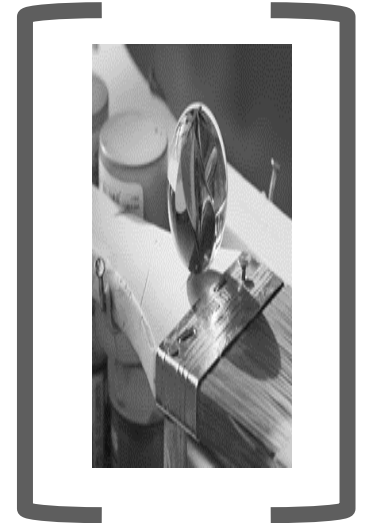
(287, 433, 3)



(220, 155, 3)



(220, 155, 1)



(1, 220, 155, 1)

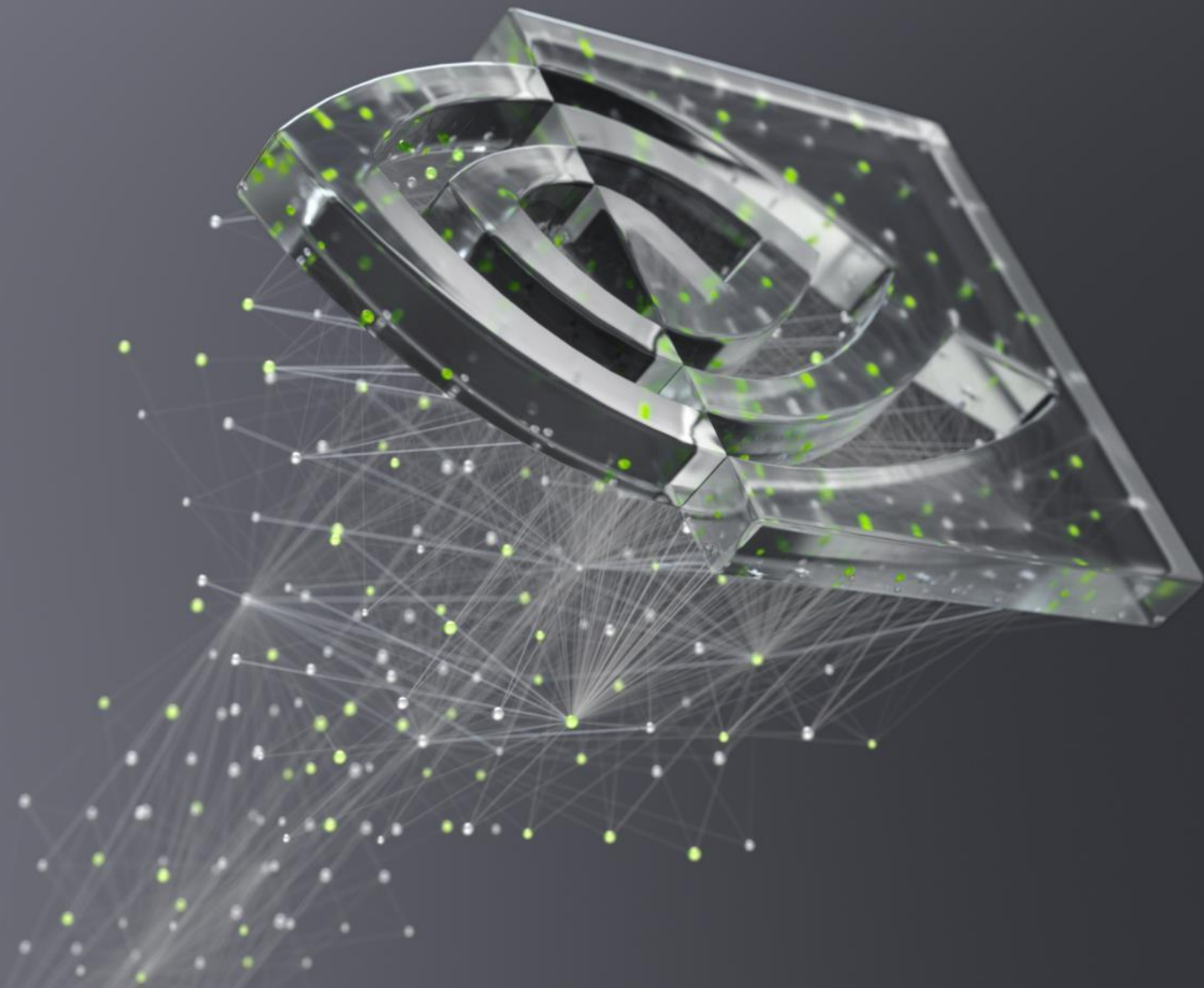
Resize

Greyscale

“Batch”



LET'S TRY IT OUT!



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