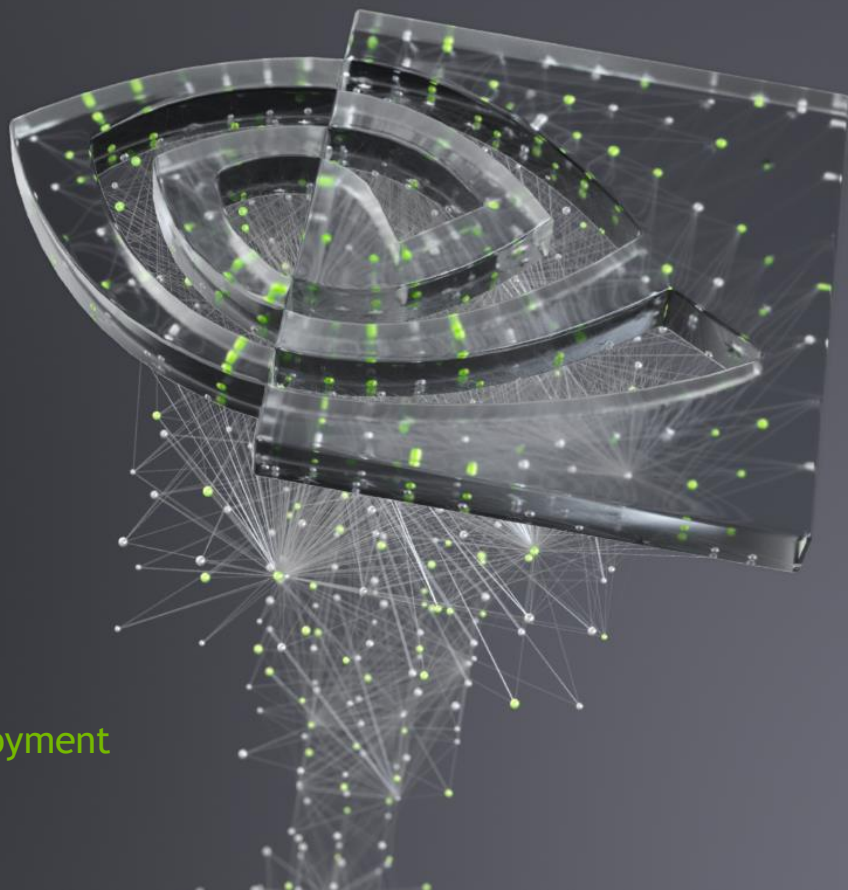# NVIDIA
DEEP LEARNING INSTITUTE

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
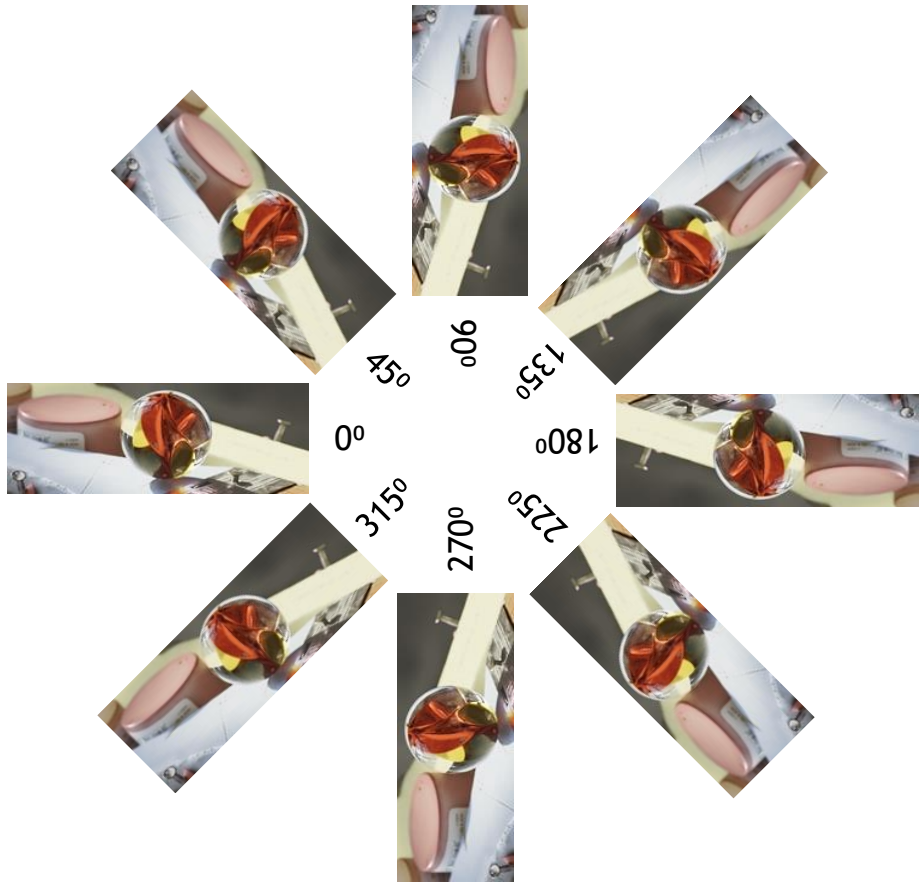
DATA AUGMENTATION

DATA AUGMENTATION
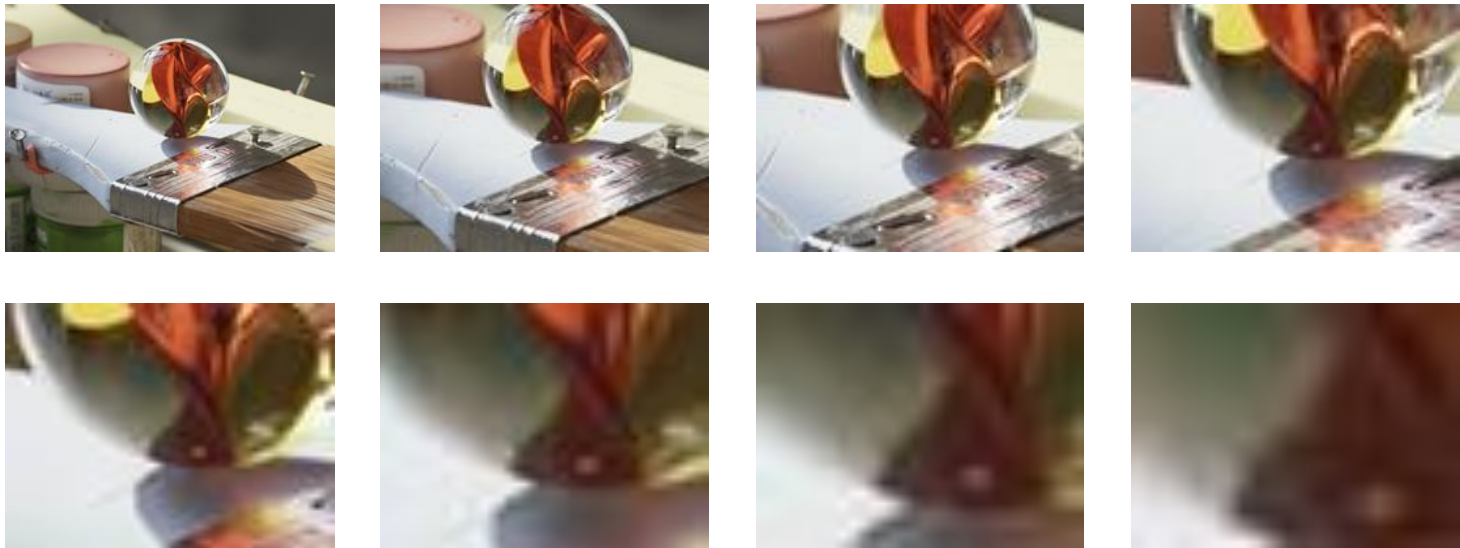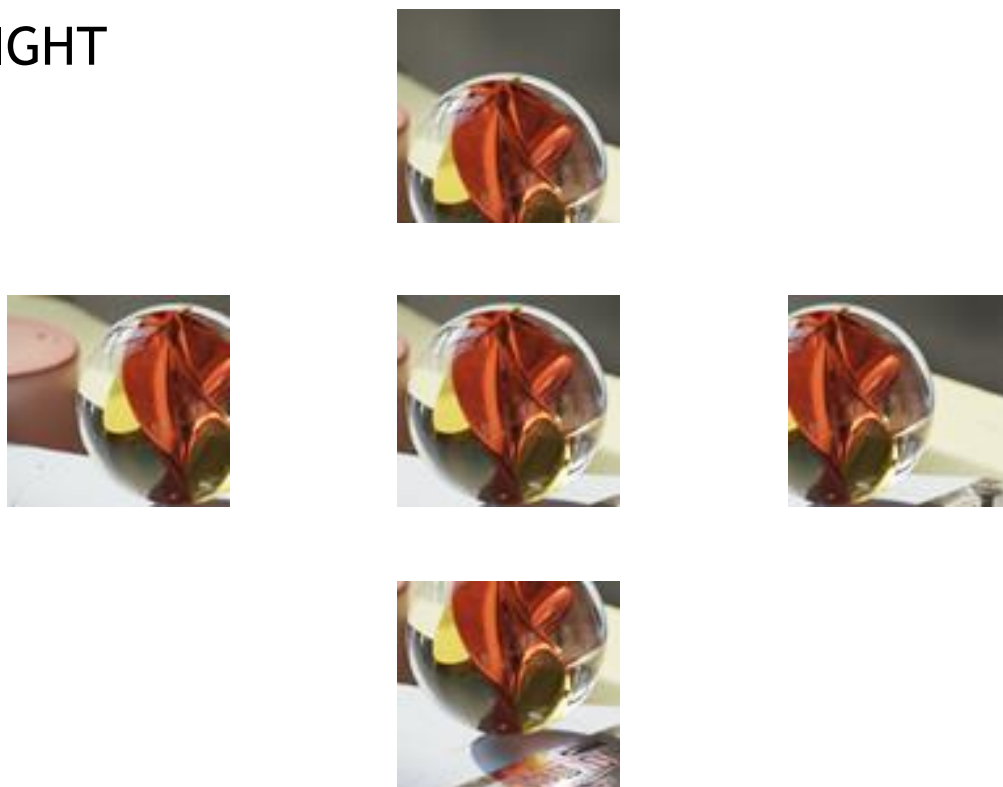
IMAGE FLIPPING

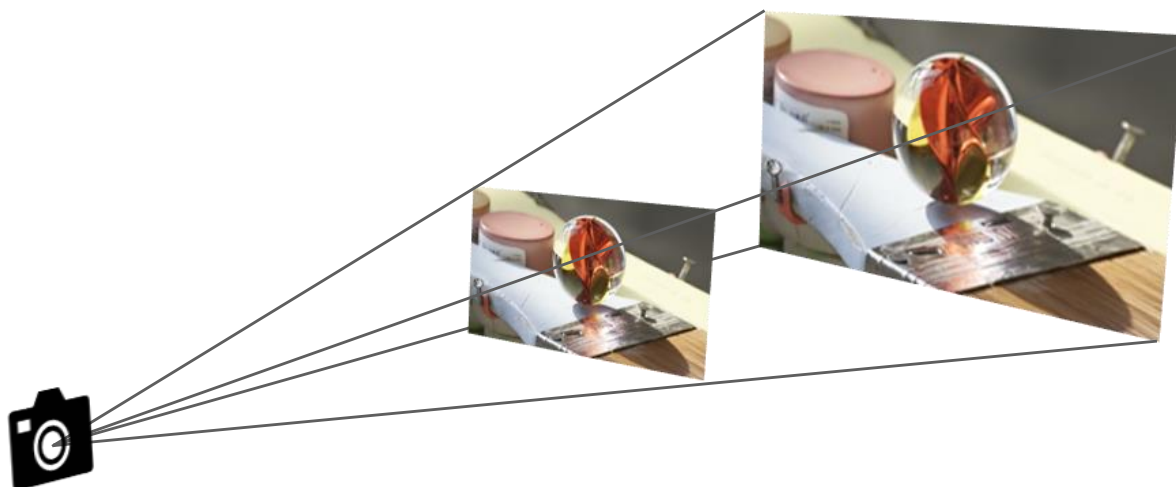**Horizontal Flip**
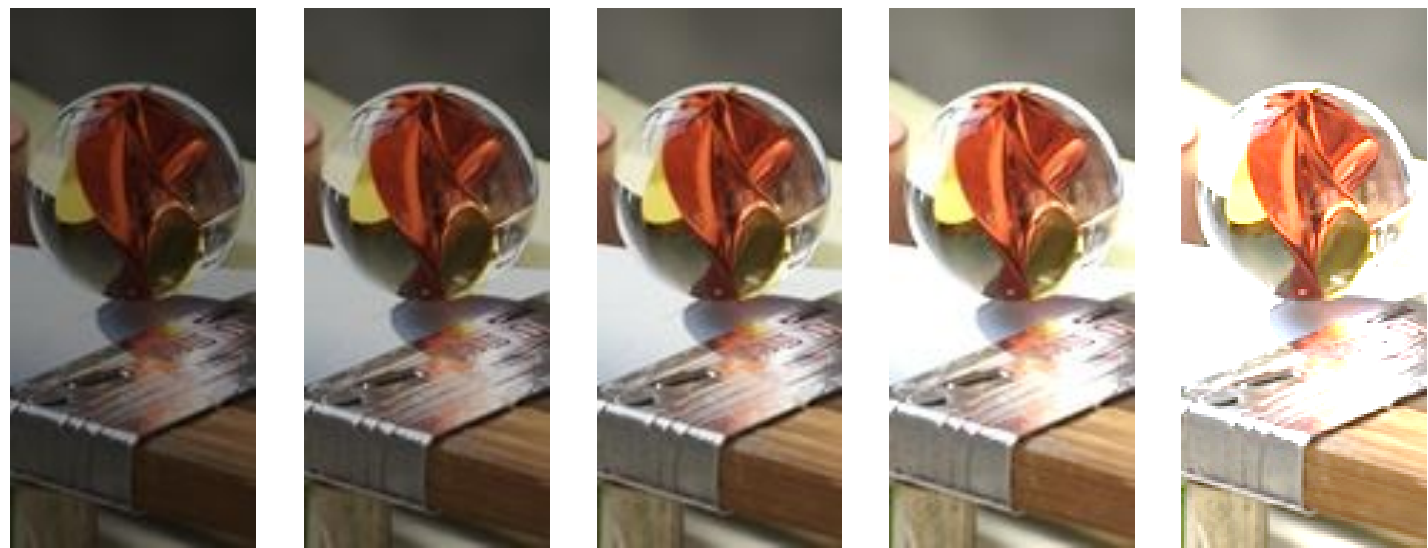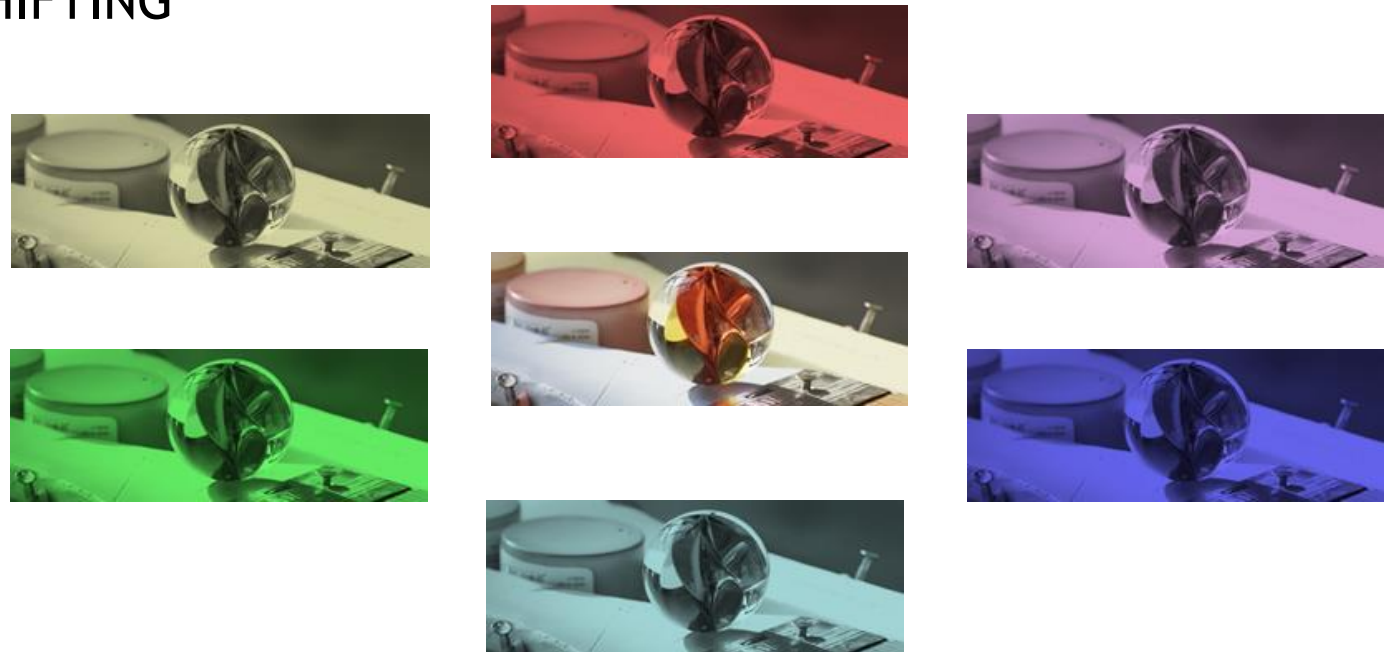
Vertical Flip

ROTATION

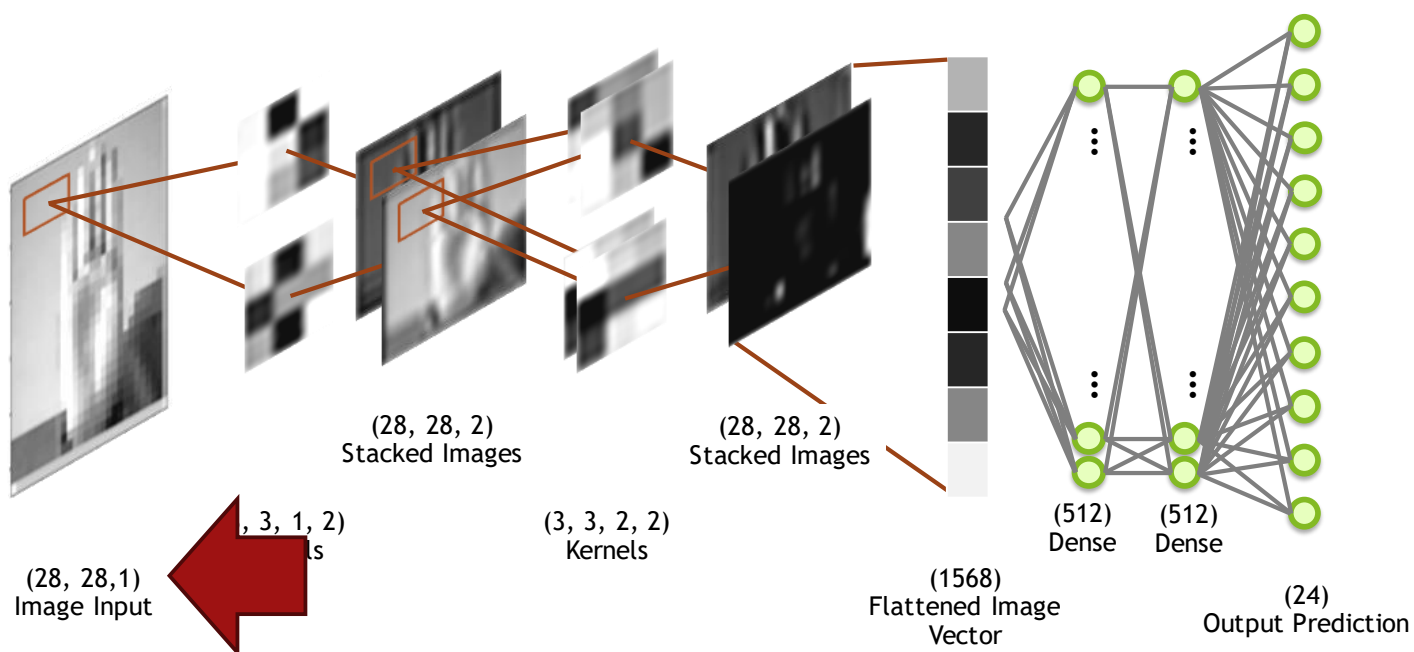# ZOOMING

WIDTH AND HEIGHT SHIFTING
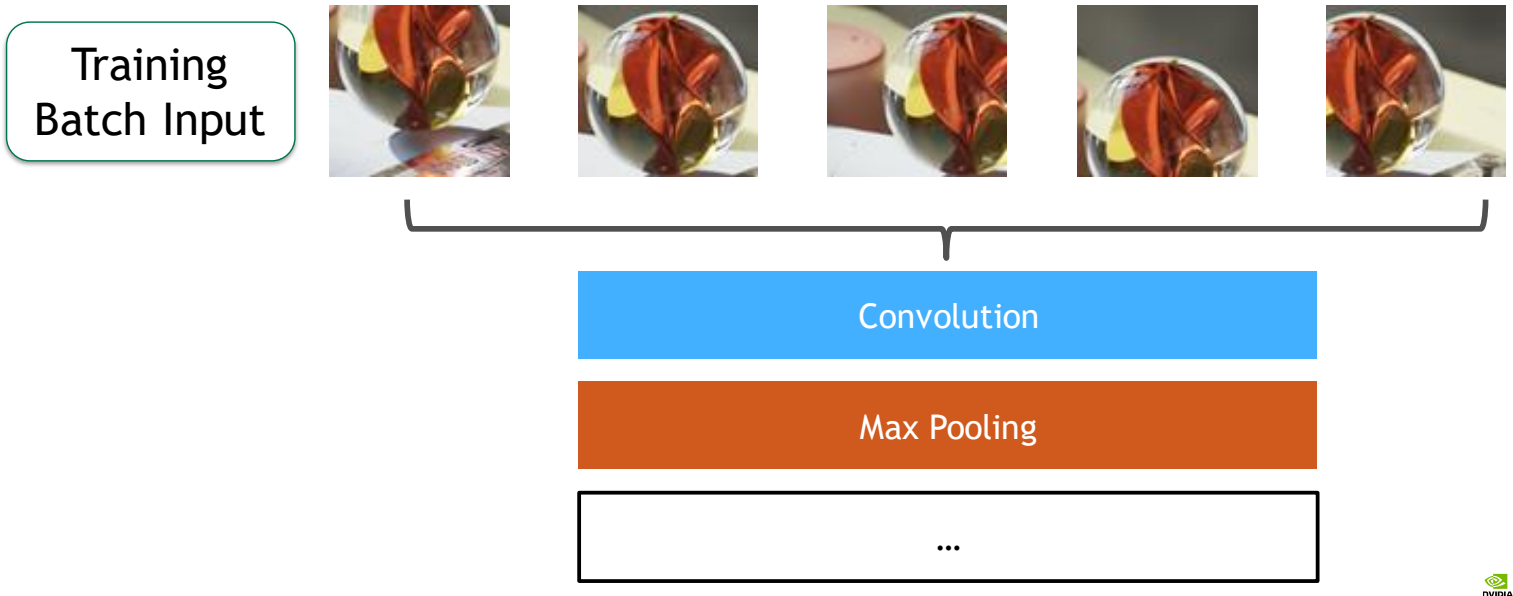
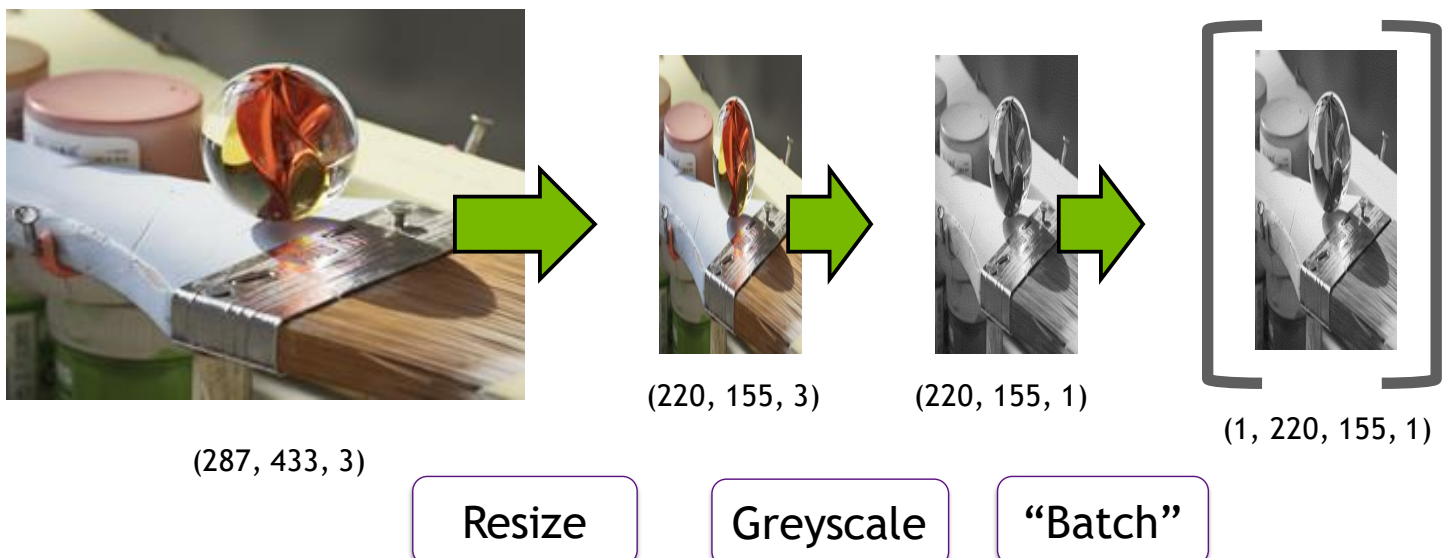# HOMOGRAPHY

BRIGHTNESS

CHANNEL
SHIFTING

MODEL DEPLOYMENT

(28, 28, 2)
Stacked Images

(28, 28, 2)
Stacked Images

, 3, 1, 2)
ls

(3, 3, 2, 2)
Kernels

(28, 28,1)
Image Input

(1568)
Flattened Image
Vector

(512)
Dense

(512)
Dense

(24)
Output Prediction

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!