



# Fundamentals of Deep Learning

Part 5: Pre-trained Models

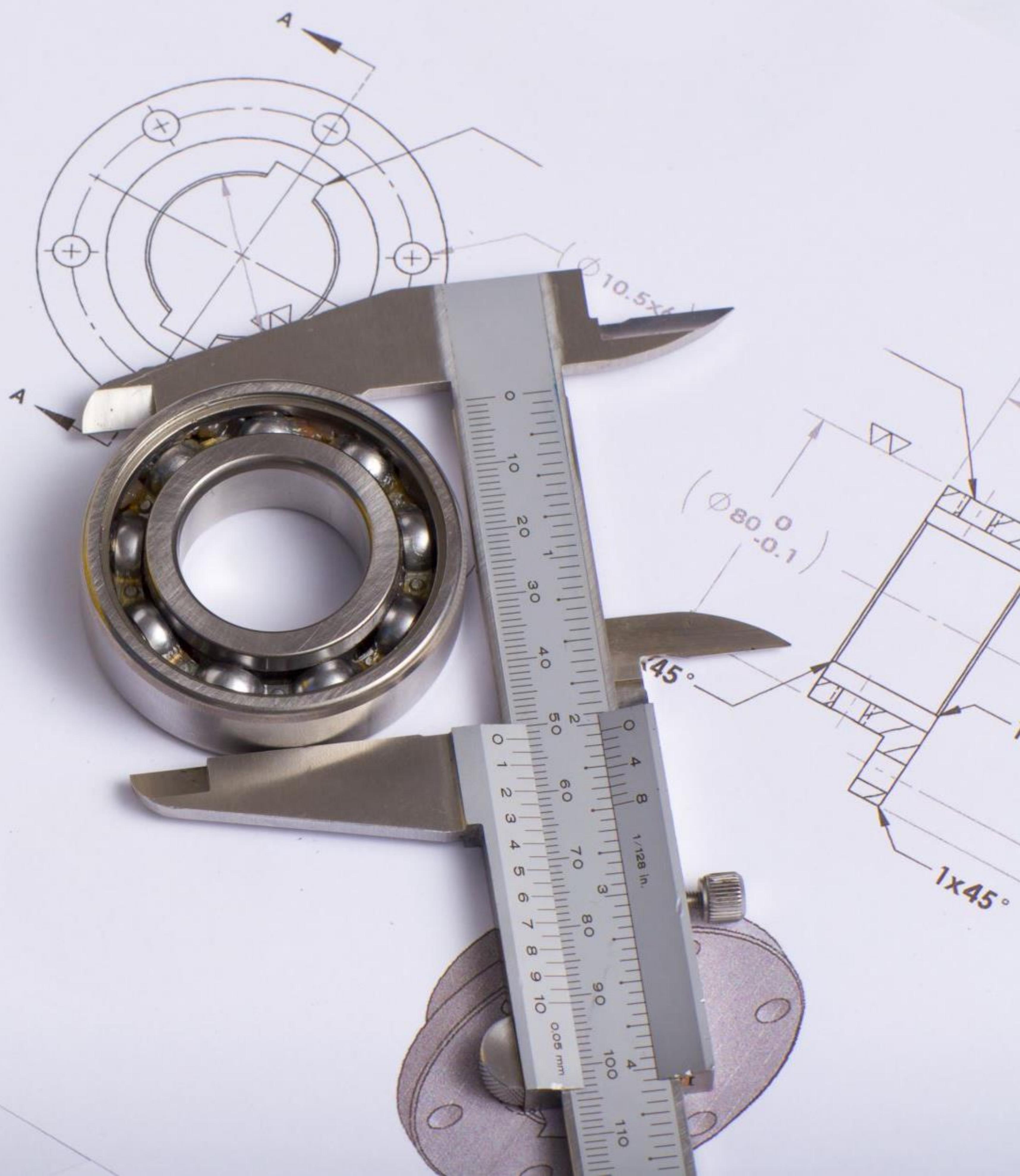


# Agenda

- 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

# **Review So Far**

# Review So Far



- Learning Rate
- Number of Layers
- Neurons per Layer
- Activation Functions
- Dropout
- Data

# Pre-Trained Models

## Pre-Trained Models

TensorFlow Hub

K Keras



PYTORCH  
HUB

# Pre-Trained Models

## VERY DEEP CONVOLUTIONAL NETWORKS FOR LARGE-SCALE IMAGE RECOGNITION

**Karen Simonyan\*** & **Andrew Zisserman<sup>+</sup>**

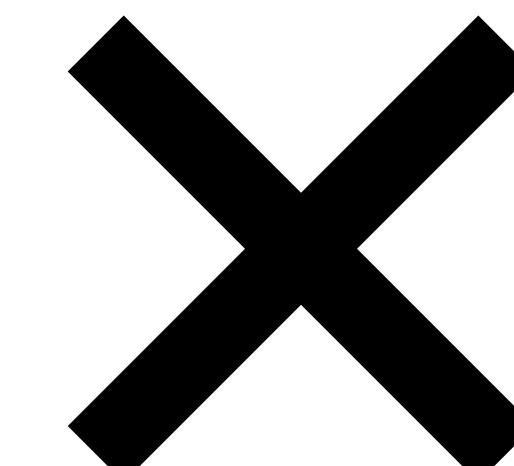
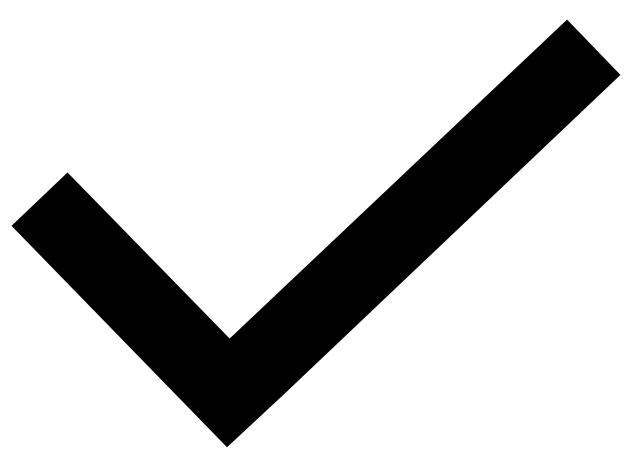
Visual Geometry Group, Department of Engineering Science, University of Oxford

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# The Next Challenge

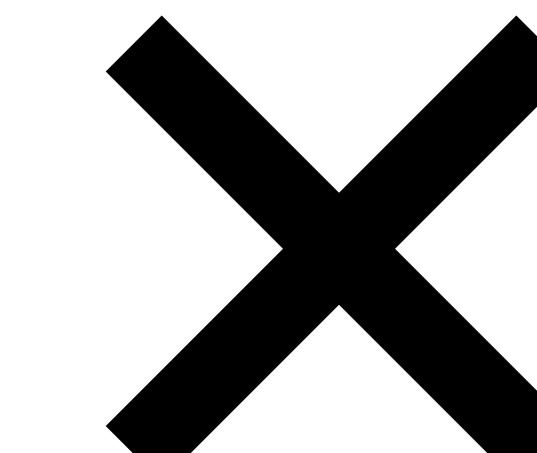
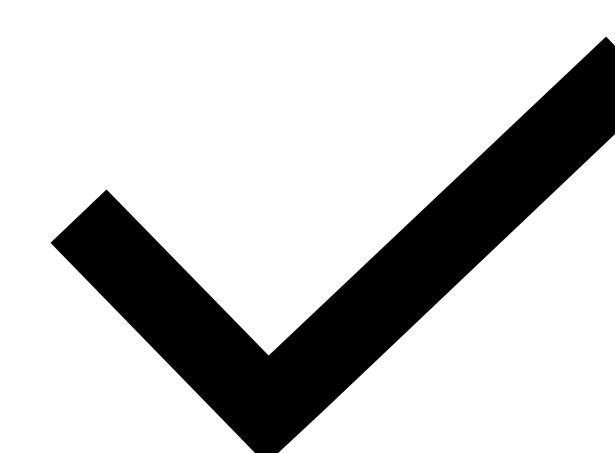
An Automated Doggy Door



# Transfer Learning

# The Challenge After

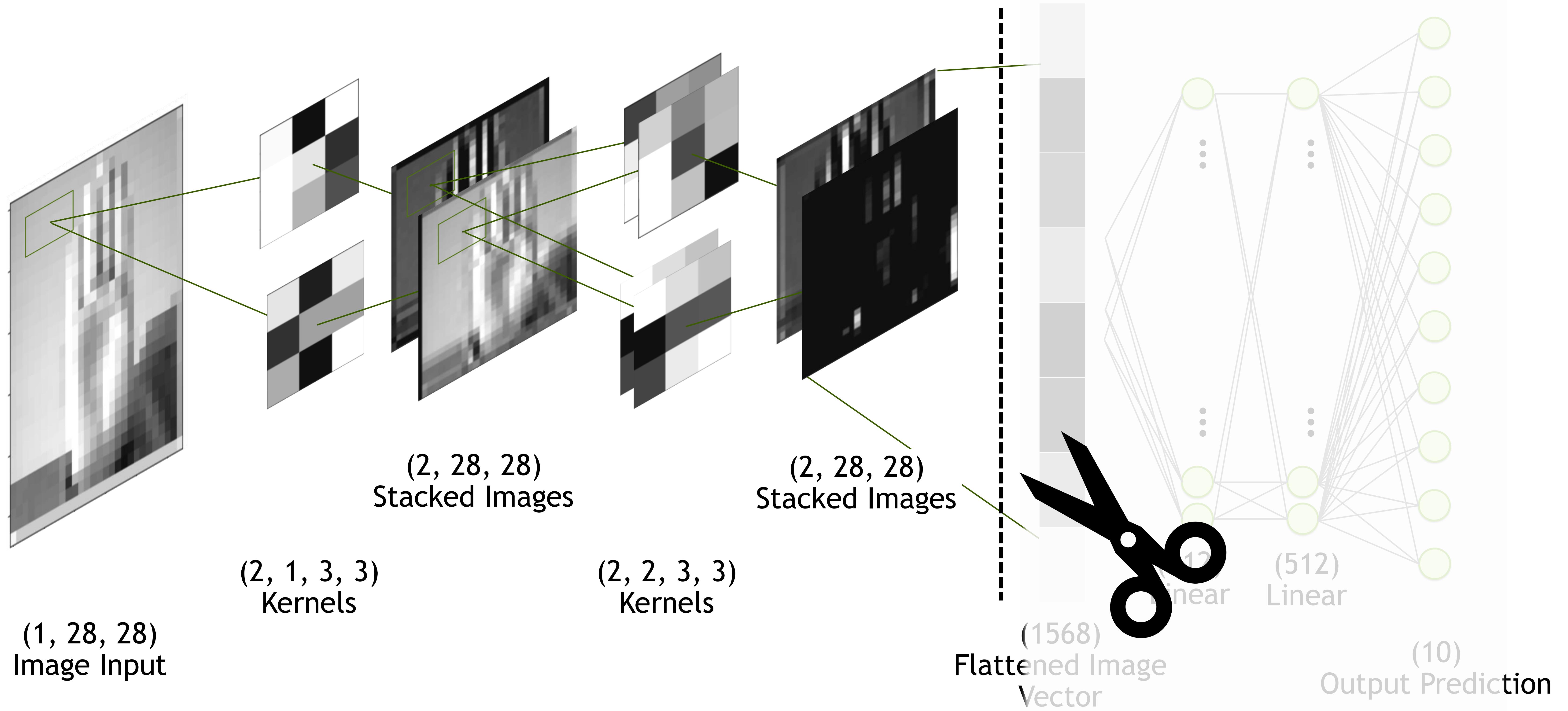
An Automated Presidential Doggy Door



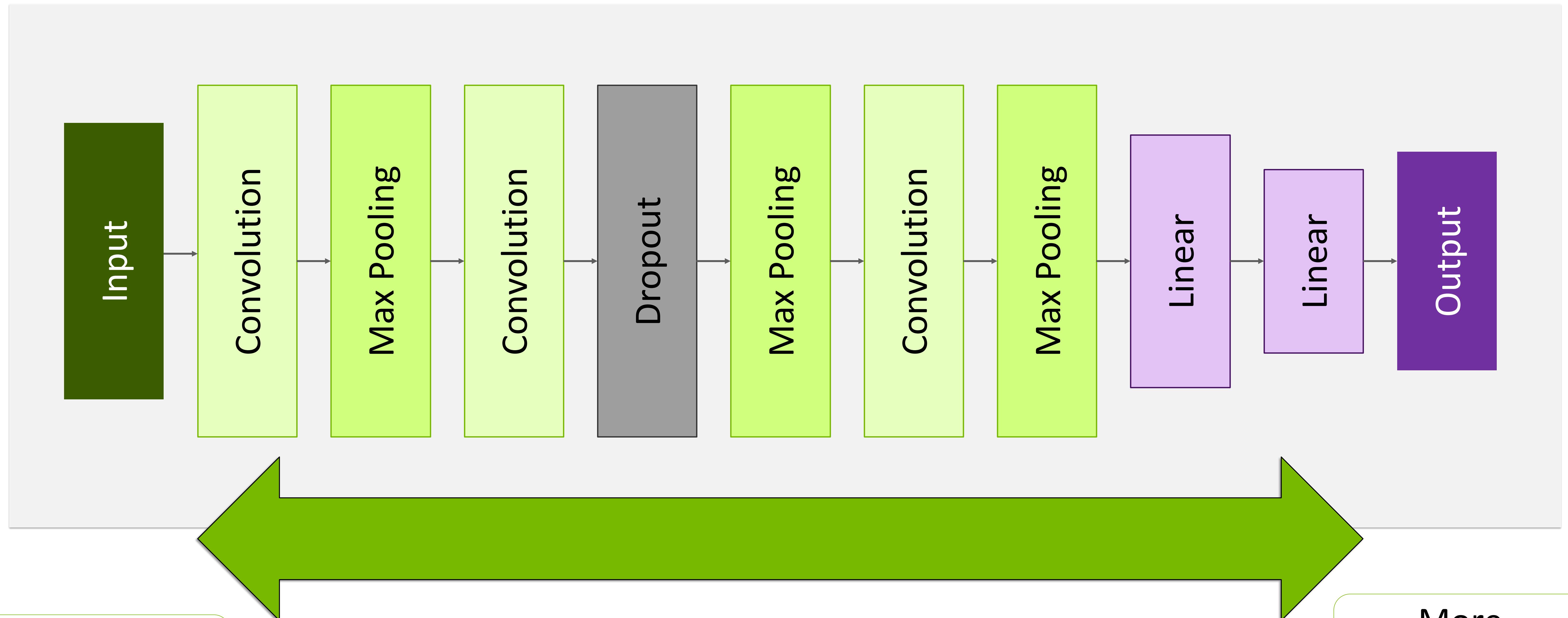
# Transfer Learning



# Transfer Learning



# Transfer Learning



More  
Generalized

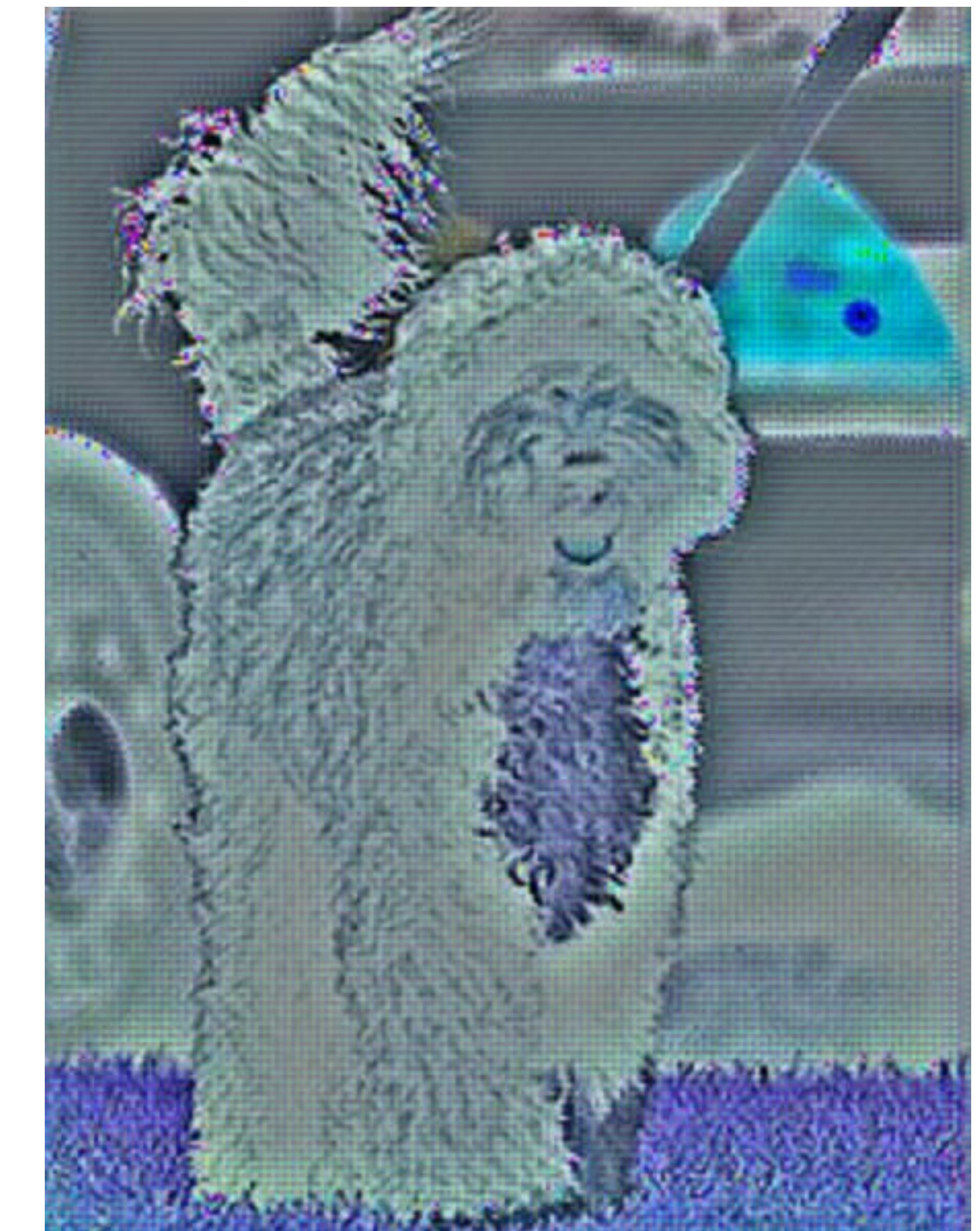
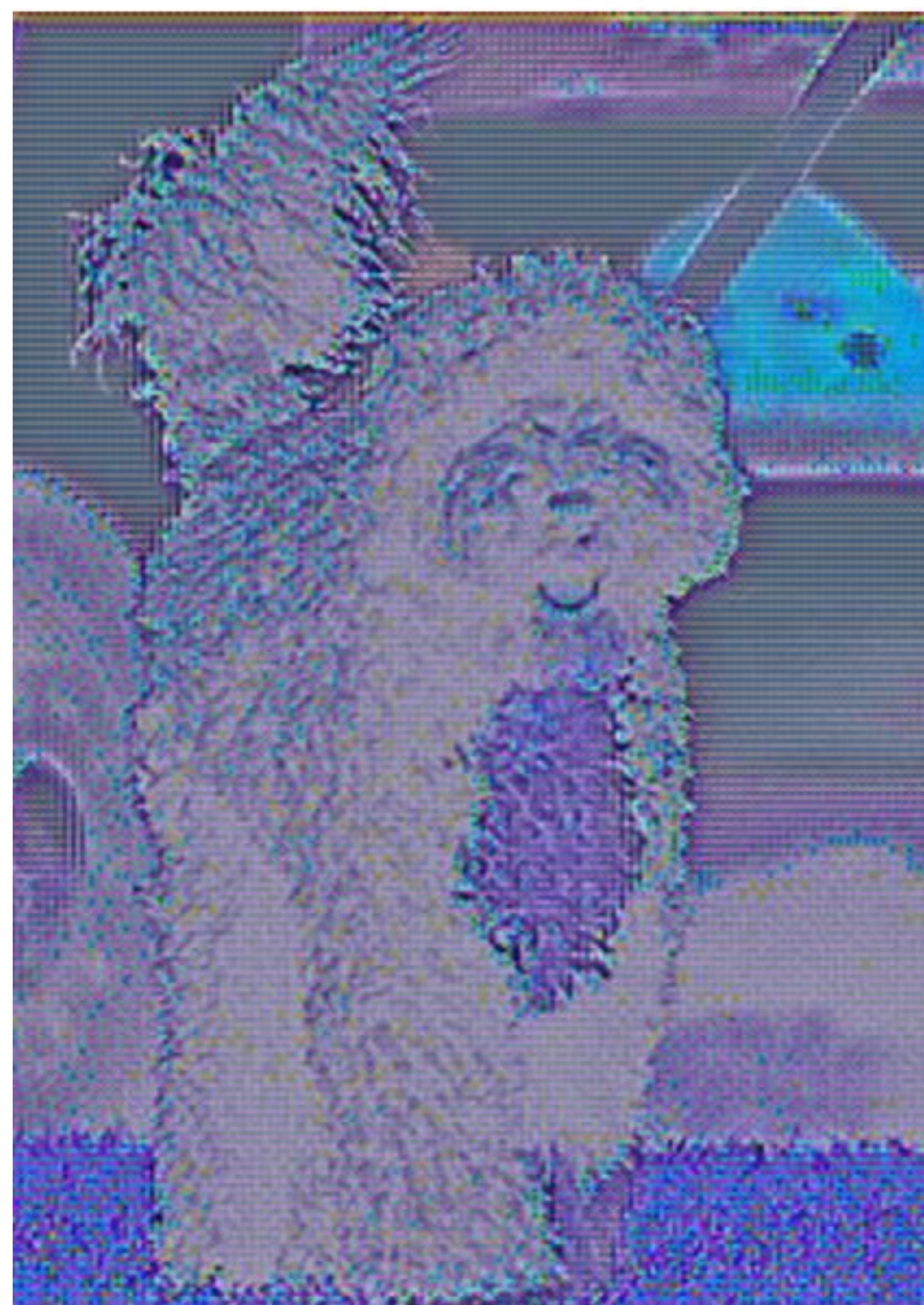
More  
Specialized

# Transfer Learning

Freezing the Model?



# Transfer Learning





A close-up, low-angle shot of a green notebook with horizontal ruling lines. The notebook is bound on the right side, and the pages are visible, showing the texture of the paper and the lines.

**Let's Get Started!**

