



Neural Networks: Getting Started



# Deep Learning Foundations

Introduction

Neural  
Network  
Anatomy

Gradient  
Descent



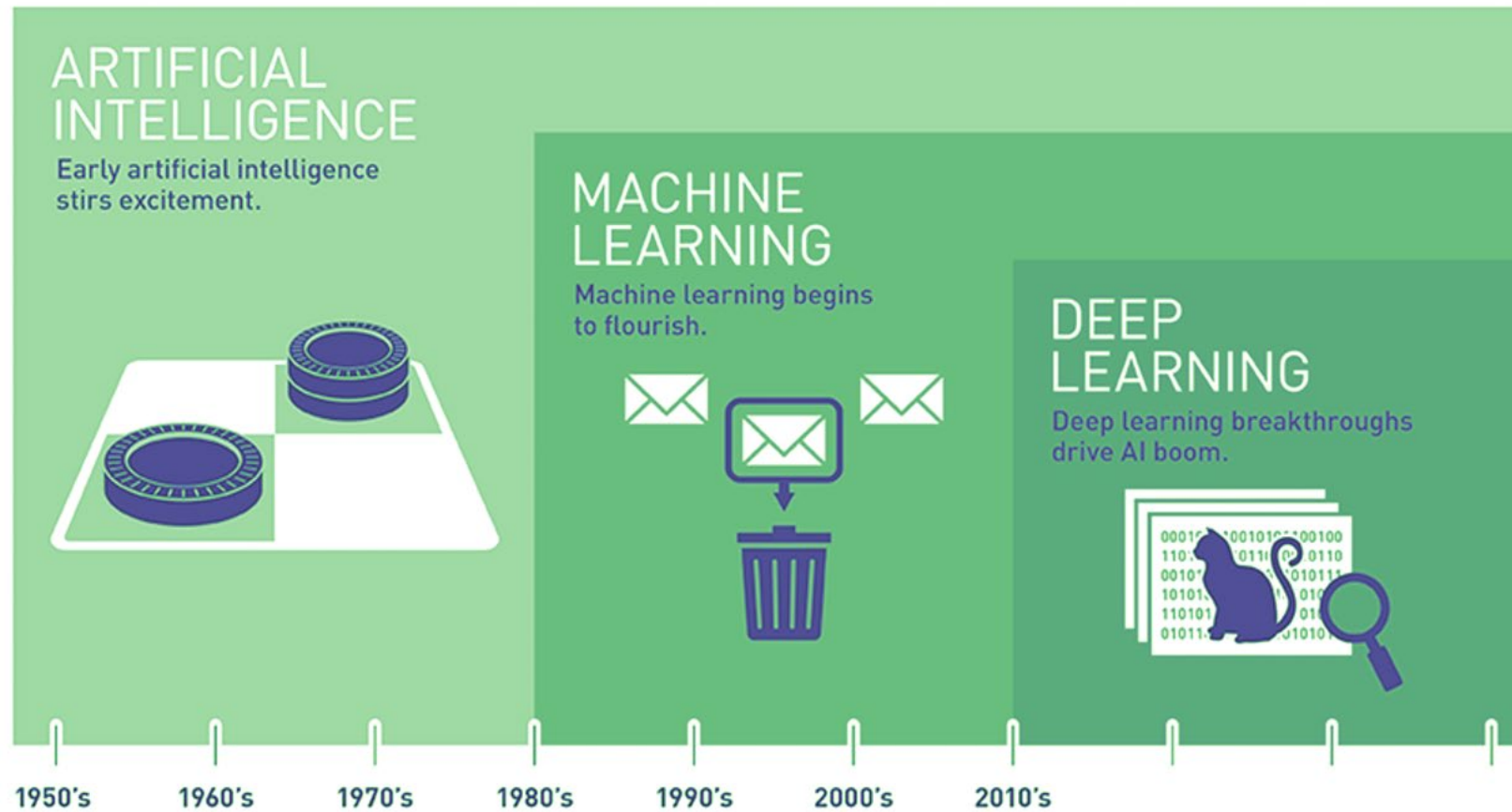


# Essential Questions

- How does it work?
- Where can I use it?



# AI is Expansive





*Artificial Intelligence is the study of “rational agents”: any system that perceives its environment and takes actions that maximize its chance of achieving its goals.*

- Russell & Norvig (2003)





*Machine learning is the field of study  
that gives computers the ability to learn without  
being explicitly programmed.*

- Arthur Samuel (1959)

Machine learning is the science and art of programming  
computers so they can learn from data.

- Aurélien Géron





# Deep Learning





# Amelia's Pizza Obsession





# IMAGENET

Train Model



ResNet50  
Model

1,000 Categories

“This is an  
image of a  
**pizza**”



## Exercise

(A Simple Classification Model)  
01.1\_resnet.ipynb



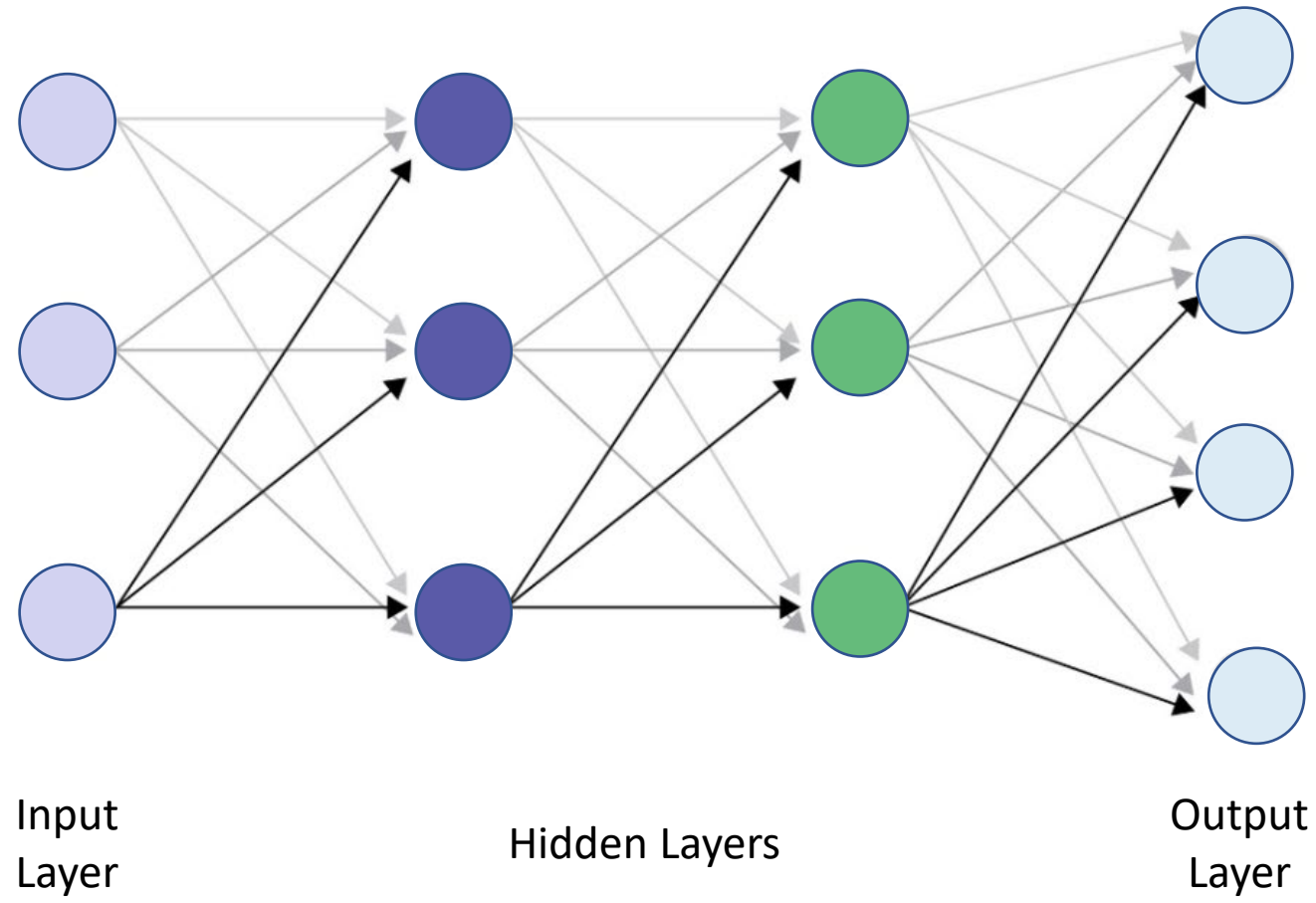


Neural Network Architectures

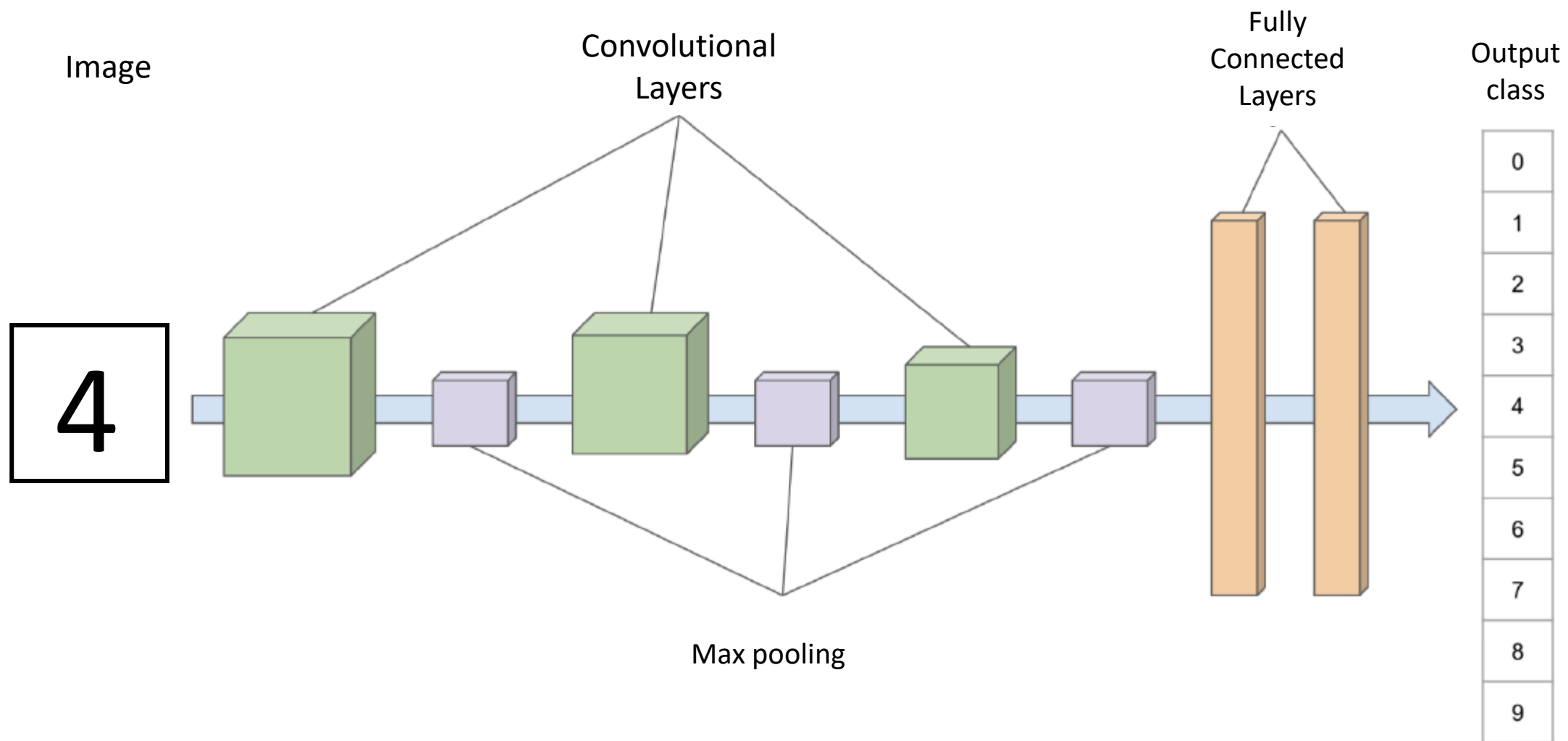




# Fully-Connected Network

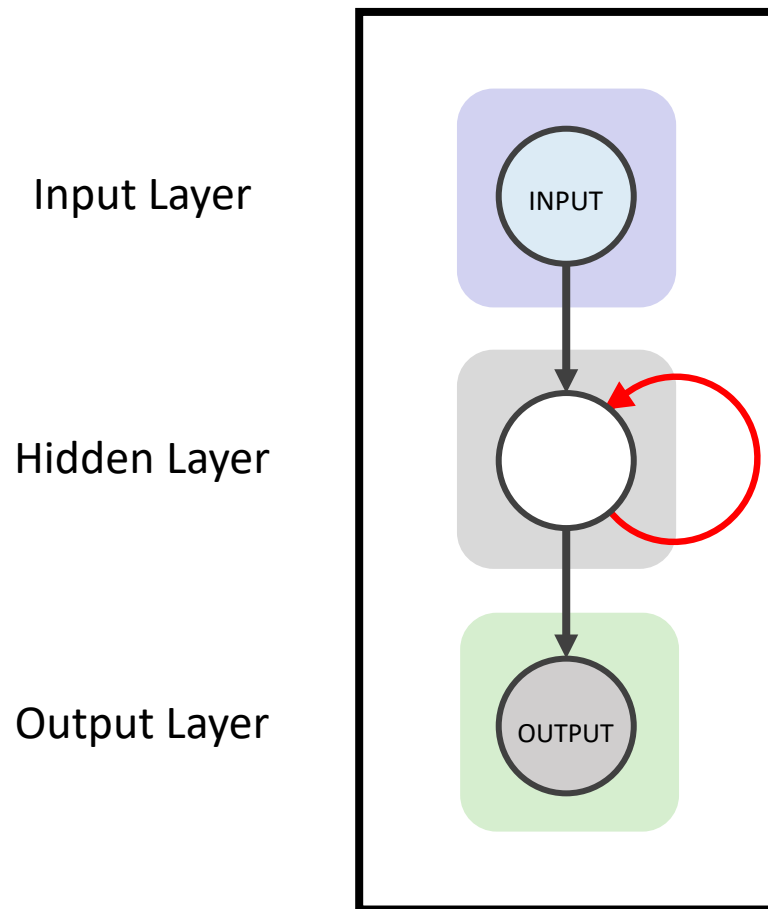


# Convolutional Neural Network

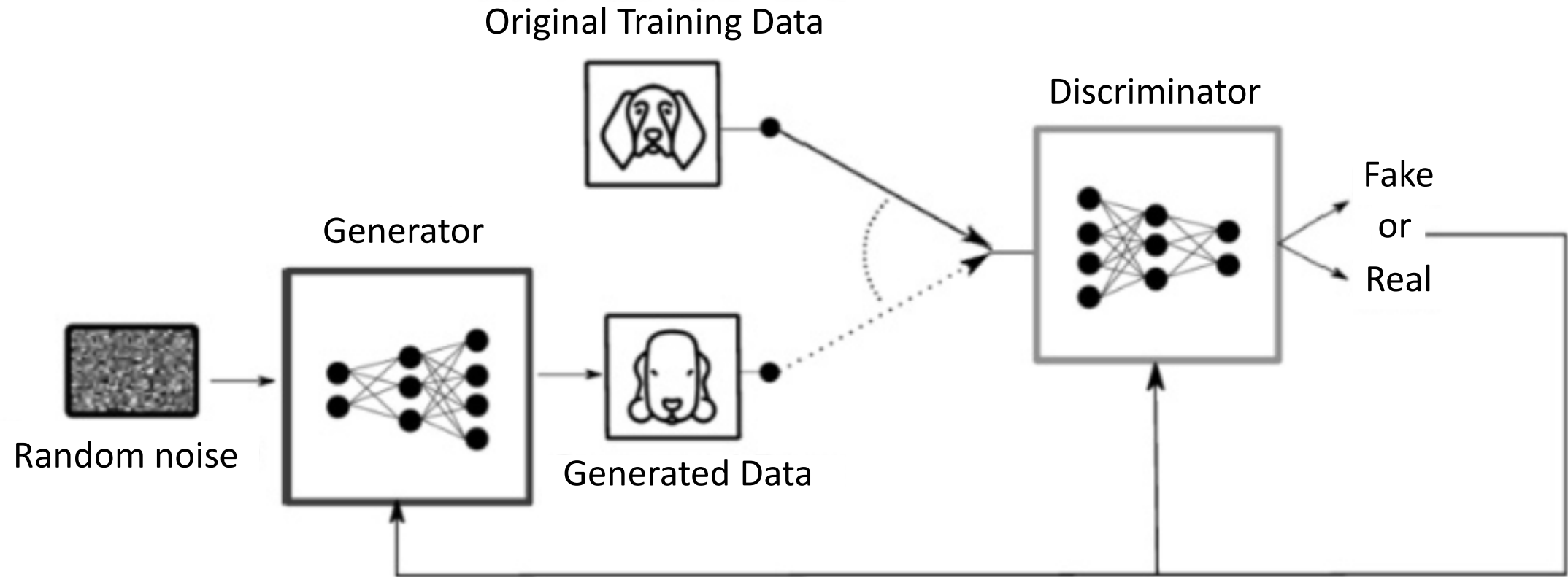




# Recurrent Neural Network



# Generative Adversarial Network



Practice

# **(Tensorflow Introduction)**

## **01.2\_tensorflow\_intro.ipynb**









TECHCHECK ✓

