

# Artificial Intelligence Engineer

## Introduction to AI/ML

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Faculty of Computing

SLIIT

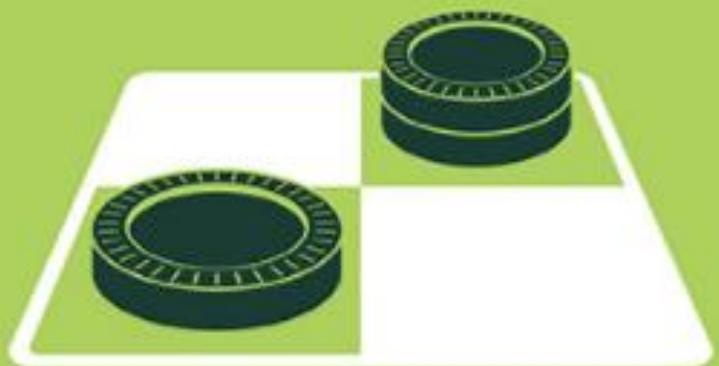
# Agenda

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- What is Artificial Intelligence, Machine Learning ?
- Programming vs Machine Learning
- Current Applications of AI/ML

# ARTIFICIAL INTELLIGENCE

Early artificial intelligence stirs excitement.



1950's

1960's

1970's

1980's

1990's

2000's

2010's

# MACHINE LEARNING

Machine learning begins to flourish.



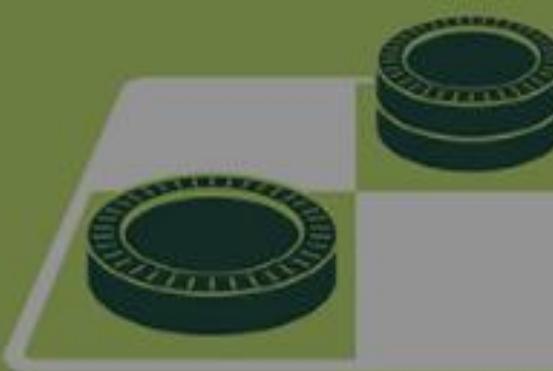
# DEEP LEARNING

Deep learning breakthroughs drive AI boom.



# ARTIFICIAL INTELLIGENCE

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ENIAC – Worlds first general purpose Electronic Computer (1946)

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## DEEP LEARNING

Deep learning breakthroughs fuel the AI boom.



# ARTIFICIAL INTELLIGENCE

Early artificial intelligence stirs excitement.

## 1956 Dartmouth Conference: The Founding Fathers of AI



John McCarthy



Marvin Minsky



Claude Shannon



Ray Solomonoff



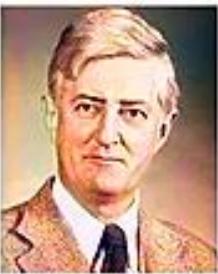
Alan Newell



Herbert A. Simon



Arthur Samuel



Oliver Selfridge



Nathaniel Rochester



Trenchard More

LEARNING

Learning breakthroughs  
and boom.



## The Founding Fathers of AI – 1956 Dartmouth Workshop

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# Programming vs Machine Learning

## **Traditional Programming:**

Rules + Data → Desired Output

## **Machine Learning:**

Desired Output + Data → Rules

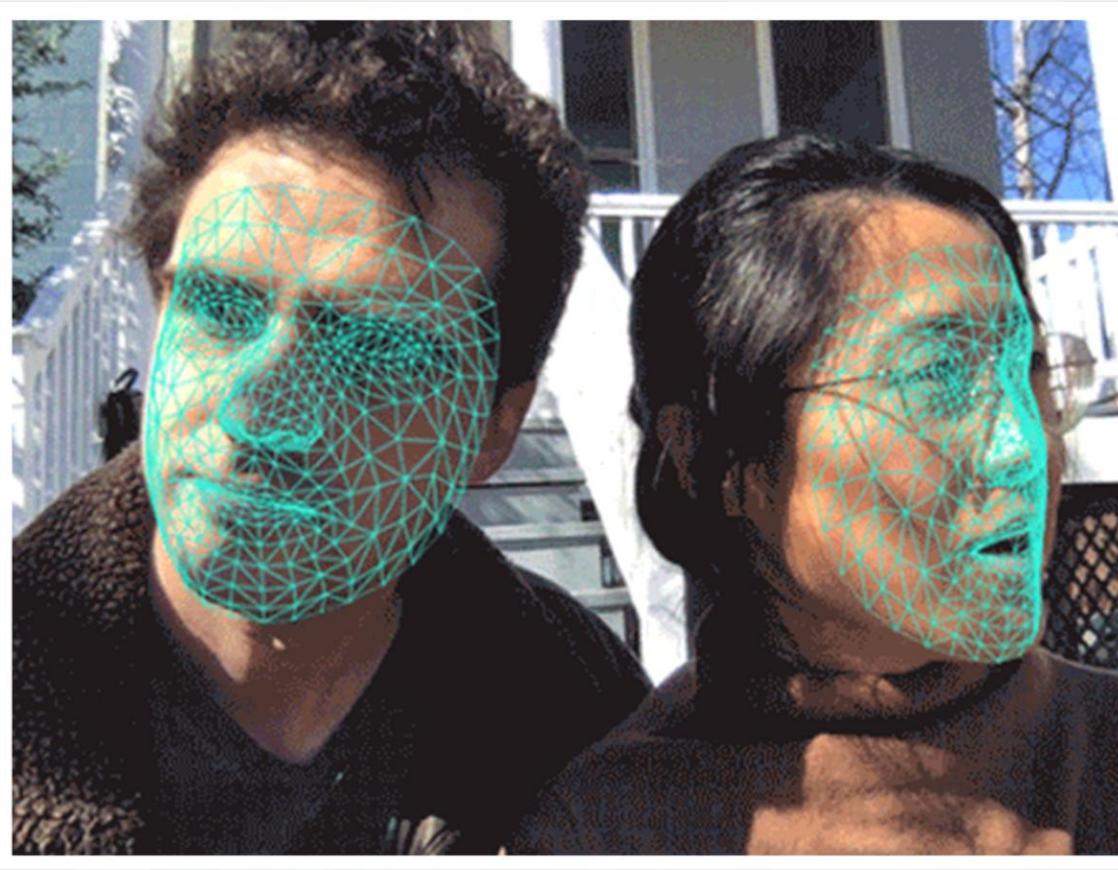
# Types of Deep Learning Models and their uses

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- Convolutional Neural Networks
  - Computer Vision, Image Classifications
- Recurrent Neural Networks
  - Process Sequences, e.g. Text, Speech, Audio
- Reinforcement Learning
  - Well known in Games, used in Robotics
- Generative Adversarial Networks
  - Generating new artifacts e.g. photos, videos, music

# Recent Demos of What Deep Learning can do

Facemesh Package



Handpose Package



# Which image is the computer generated one?



A



B



C

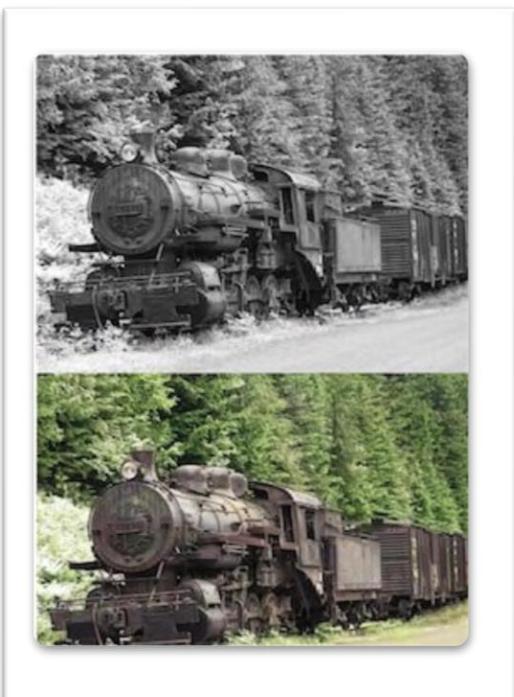
# Applications Out there

<https://deepai.org/machine-learning-model/colorizer>

<https://generated.photos/#>

<https://artbreeder.com>

<https://depart.io>



New — What is generative media? →

## Unique, worry-free model photos

Enhance your creative works with photos generated completely by AI. Find model images through our sorted and tagged app, or integrate images via API.

# ARTBREEDER

Extend your imagination

DEEPAI. IMAGE TO DRAW THE CONTENT OF ANOTHER. GET YOUR OWN ARTWORK IN JUST THREE STEPS.

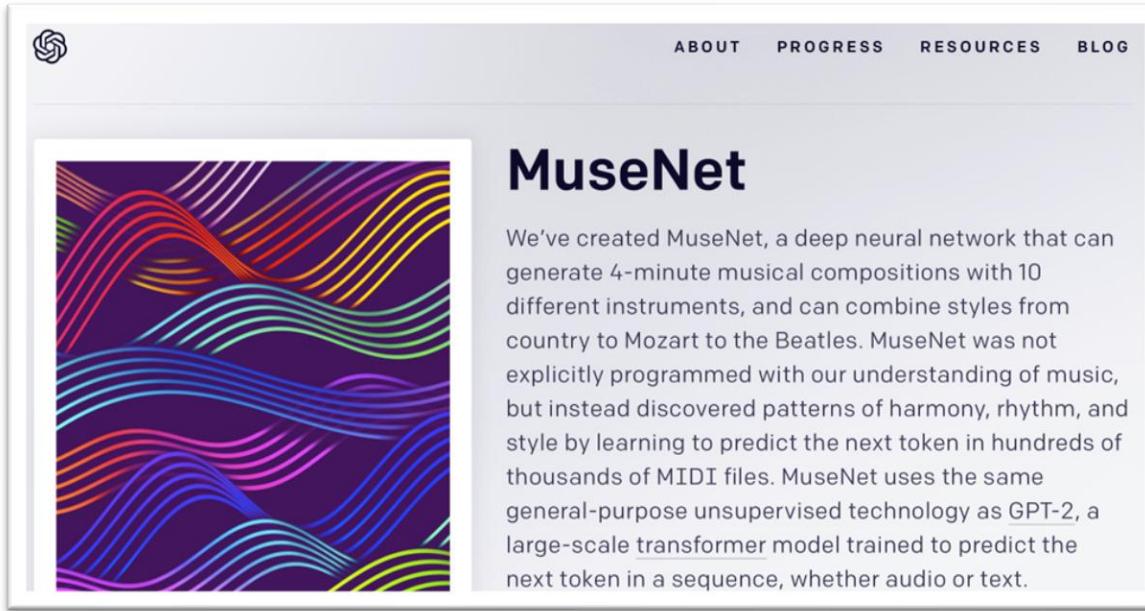
Latest artworks   [CREATE YOUR OWN](#)   Videos   Offer   About   Register   Sign in

**1 Upload photo**  
The first picture defines the scene you would like to have painted.

**2 Choose style**  
Choose among predefined styles or upload your own style image.

**3 Submit**  
Our servers paint the image for you. You get an email when it's done.

# Applications Out there



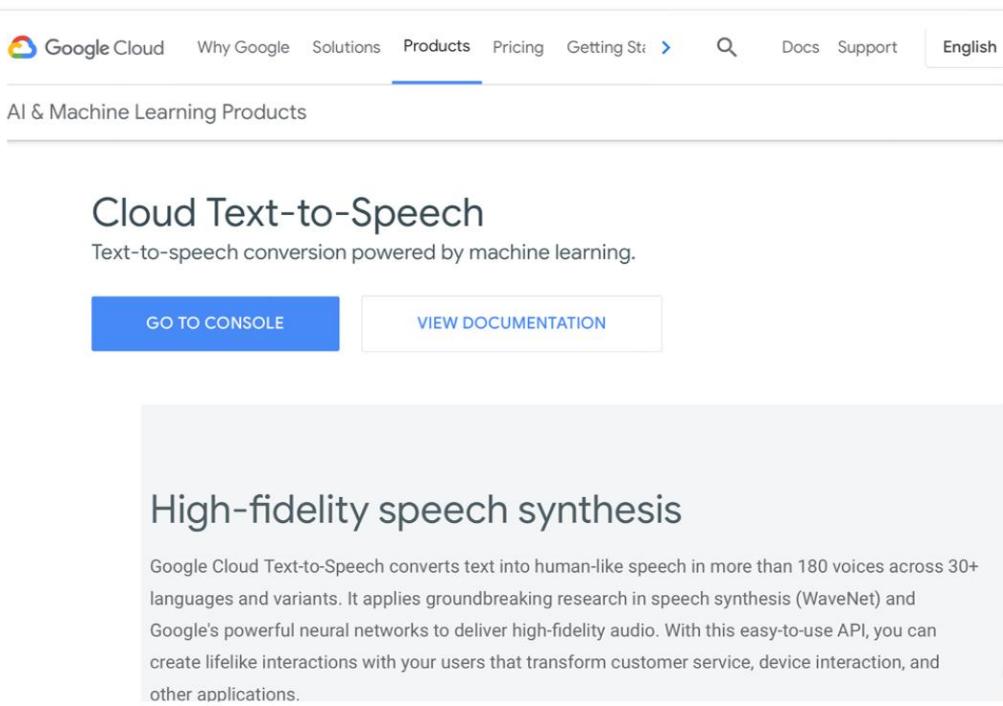
The screenshot shows the MuseNet website. At the top, there is a navigation bar with links for ABOUT, PROGRESS, RESOURCES, and BLOG. Below the navigation bar is a large, colorful graphic of wavy lines in various colors (purple, blue, green, yellow, red) on a dark background. To the right of the graphic, the title "MuseNet" is displayed in a large, bold, dark font. Below the title, a detailed description explains that MuseNet is a deep neural network capable of generating 4-minute musical compositions with 10 different instruments, combining styles from country to Mozart to the Beatles. It uses GPT-2 technology to predict the next token in hundreds of thousands of MIDI files.

## MuseNet

<https://openai.com/blog/musenet/>

## WaveNet

<https://cloud.google.com/text-to-speech>



The screenshot shows the Google Cloud Text-to-Speech page. At the top, there is a navigation bar with links for Google Cloud, Why Google, Solutions, Products (which is underlined), Pricing, Getting Started, Docs, Support, and English. Below the navigation bar, the text "AI & Machine Learning Products" is displayed. The main section features the heading "Cloud Text-to-Speech" and the subtext "Text-to-speech conversion powered by machine learning." Below this, there are two buttons: "GO TO CONSOLE" and "VIEW DOCUMENTATION".

## High-fidelity speech synthesis

Google Cloud Text-to-Speech converts text into human-like speech in more than 180 voices across 30+ languages and variants. It applies groundbreaking research in speech synthesis (WaveNet) and Google's powerful neural networks to deliver high-fidelity audio. With this easy-to-use API, you can create lifelike interactions with your users that transform customer service, device interaction, and other applications.

# Current AI/ML solutions

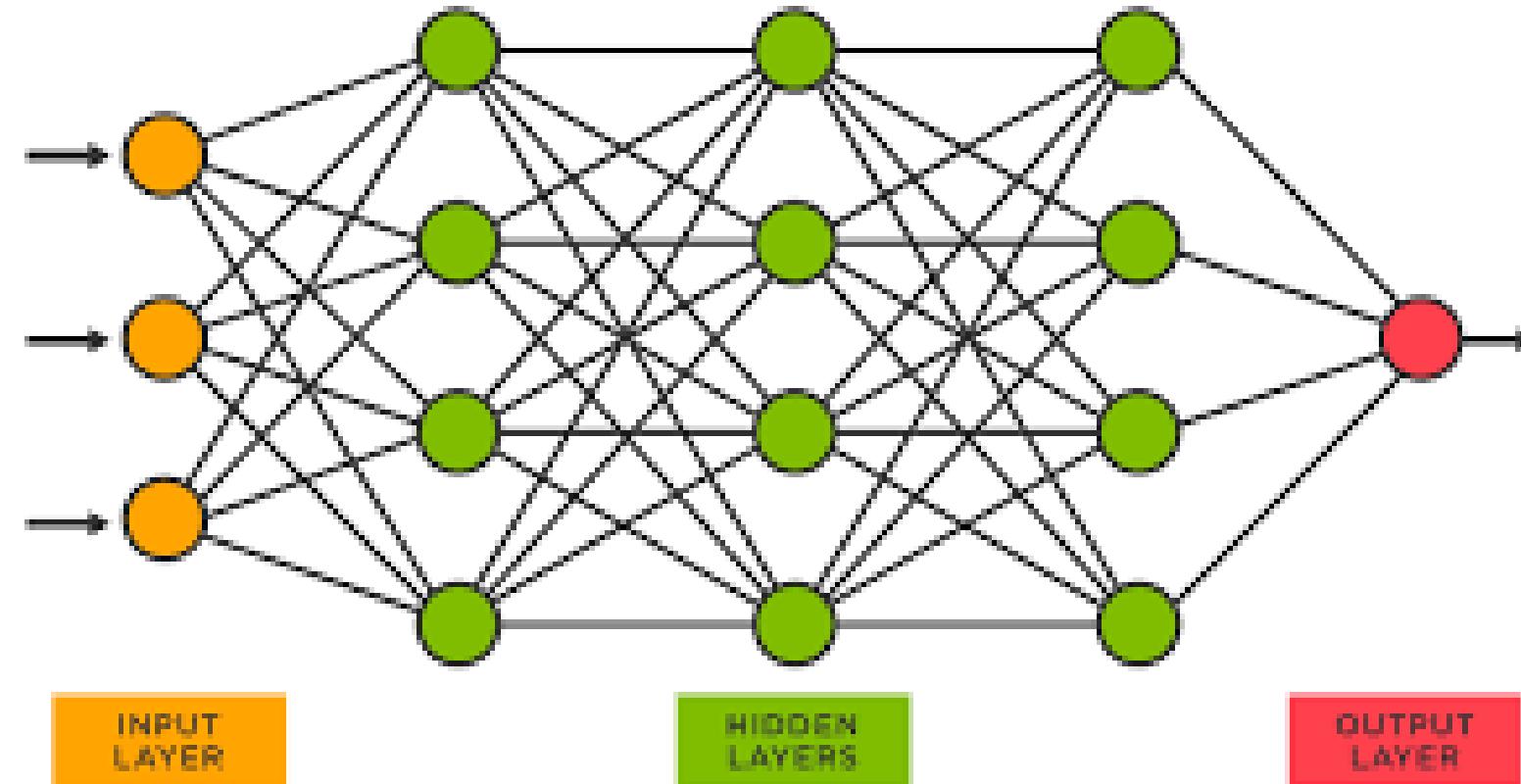
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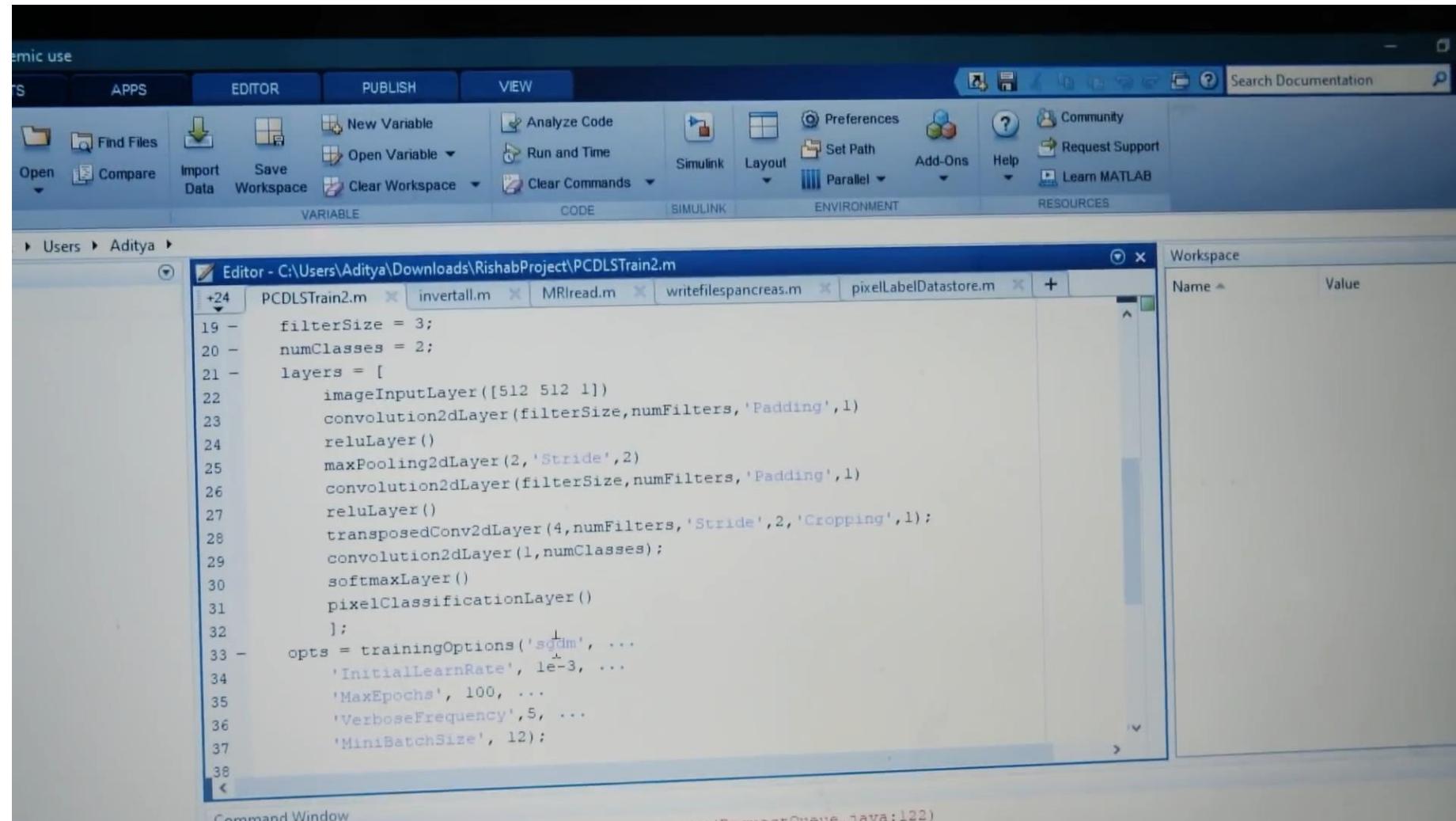
- Recommendation Systems
- Computer Vision
- Natural Language Processing
- Language Translation
- Clustering
- Forecasting
- Reinforcement Learning
- General Adversarial Networks



# A Neural Network

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# Resources

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- [AI for Oceans – code.org](#)
- [Learn about AI – code.org](#)
- <https://experiments.withgoogle.com/collection/ai>
- <https://www.microsoft.com/en-us/ai>
- <https://ai.google>

# Resources - Videos

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- [The Age of AI – YouTube Originals](#)
- [Machine Learning: Living in the Age of AI | A Wired Film](#)