**Лабораторна робота 7**

**Синтез роботи нейронних мереж у різних середовищах Matlab/Python**

Мета: Навчитись перетворювати готові моделі TensorFlow навчених ансамблів мереж в MATLAB моделі. Навчитись сумісному використанню моделей.

Варіант 1

Sign Language Recognition

import pandas as pd

import tensorflow as tf

from tensorflow.keras.models import Sequential

from tensorflow.keras.layers import Conv2D, MaxPooling2D, Flatten, Dense, Dropout

from tensorflow.keras.utils import to\_categorical

train\_file\_path = 'C:\\Users\\baras\\\OneDrive\\Рабочий стол\\Unik\\SSSHII\\Lb7\\TestData.csv'

test\_file\_path = 'C:\\Users\\baras\\OneDrive\\Рабочий стол\\Unik\\SSSHII\\Lb7\\TrainData.csv'

train\_df = pd.read\_csv(train\_file\_path)

test\_df = pd.read\_csv(test\_file\_path)

num\_classes = max(train\_df['label'].max(), test\_df['label'].max()) + 1

X\_train = train\_df.iloc[:, 1:].values

y\_train = train\_df['label'].values

X\_test = test\_df.iloc[:, 1:].values

y\_test = test\_df['label'].values

X\_train = X\_train.reshape(-1, 28, 28, 1) / 255.0

X\_test = X\_test.reshape(-1, 28, 28, 1) / 255.0

y\_train = to\_categorical(y\_train, num\_classes=num\_classes)

y\_test = to\_categorical(y\_test, num\_classes=num\_classes)

input\_shape = (28, 28, 1)

model = Sequential([

    Conv2D(32, kernel\_size=(3, 3), activation='relu', input\_shape=input\_shape),

    MaxPooling2D(pool\_size=(2, 2)),

    Conv2D(64, kernel\_size=(3, 3), activation='relu'),

    MaxPooling2D(pool\_size=(2, 2)),

    Flatten(),

    Dense(128, activation='relu'),

    Dropout(0.5),

    Dense(num\_classes, activation='softmax')

])

model.compile(optimizer='adam', loss='categorical\_crossentropy', metrics=['accuracy'])

model.fit(X\_train, y\_train, epochs=10, batch\_size=32, validation\_data=(X\_test, y\_test))

test\_loss, test\_accuracy = model.evaluate(X\_test, y\_test)

print(f"Точність: {test\_accuracy \* 100:.2f}%")

model.save('C:\\Users\\baras\\OneDrive\\Рабочий стол\\Unik\\SSSHII\\Lb7\\sign\_language\_model.h5')



