EESEC 440: English for Electrical & Computer Engineering\*

\*on Deep Learning field of study.

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*Abstract*—This document is a report gradually formed by the instructor of EESEC 440 course that is taught in Spring 2021 Semester in Gumushane University. The instructor thought it would be the best to assign a particular topic to each student depending on the individual’s research interest, but the vast number of students (35 + 45) made this option not possible. Therefore, a discussion is made between the students and the instructor in the first class to determine a common topic for the course. Due to diversity of student interests on different fields of study in Electrical & Computer Engineering, the instructor recommended to go with Deep Learning, which gained enormous importance in the last decade. EESEC 440 context is closely related to the materials presented by Dr Gokhan Cetin in EESEC 422 Artificial Intelligence course given in Spring 2021 Semester.

Keywords—Deep Learning (DL), Artificial Intelligence (AI)

# Artificial Neural Networks (ANN)

Artificial neural networks are powerful tools in building complex mathematical relationship between input-output data. The increment in computational power provided by the new generation Graphical Processing Units (GPU) in the last decade enabled ANN to solve many engineering problems in various fields of study (e.g., Computer Vision, speech recognition, Natural Language Processing, power transfer [1], etc). There are different flavors of ANN designed for different applications. MultiLayer Perceptron (MLP) is the most common type of network employed in regression and classification problems, which are two major functions of a ANN.

## MultiLayer Perceptron (MLP)

Today, we will look at two examples of MLP, one for regression and the other for classification, both supervised learning. Please see Fig. 1 for an example MLP network.

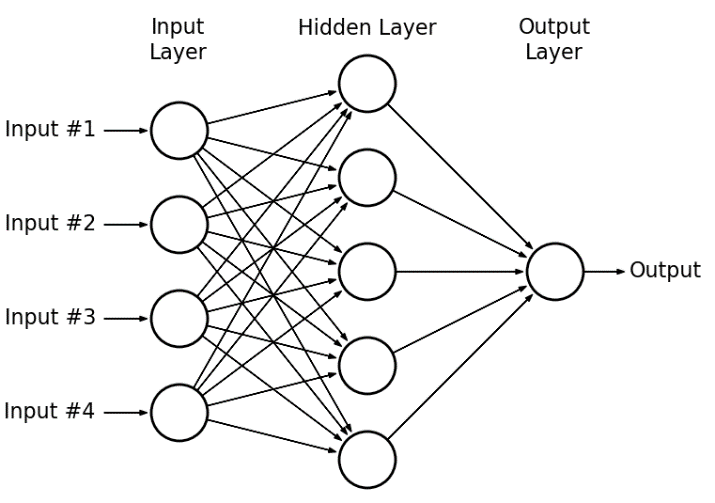


Fig. 1: A multi input single output MLP.

## Convolutional Neural Network (CNN)

In weeks 3-4-5, we will look at a classification example on images as can be seen in Fig. 2. Cats-dogs image repository on Kaggle. We will follow the tutorial given in [2].

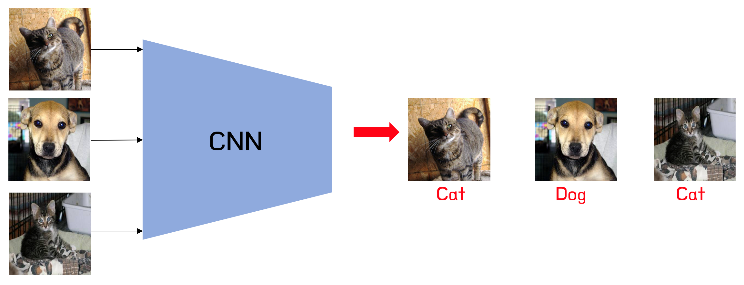


Fig. 2: Classification of cat & dog images via CNN.

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*a**b* 

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