Task 18 – Introduction to Machine Learning

A SELF-DRIVING CAR

INPUT:

- **Lidar –** laser imaging, detection & ranging
    - This helps the vehicle to sense & understand its surroundings by using laser pulses to create 3D maps of its environment & measuring. This will help track obstacles & vehicles to maintain safe distances and identify road signs, traffic signals and road markings in real-time
- **Cameras –** images of surroundings to detect objects & interpret them
- **Radar –** detecting objects & calculating speed and distance of objects
- **Sensors –** to detect vehicle position & velocity
- **GPS & other Digital Maps –** global navigation system that provides real-time location

OUTPUT:

- **Object Detection –** labelling cars, pedestrians, cyclists & any other objects
- **Lane Detection –** identifying lane boundaries & markers
- **Traffic signs & signals –** classifying stop signs, speed limit signs, traffic signals and any other signs or signals
- **Decision making –** predicting & responding to environment for best steering angle, acceleration and brake commands

NETFLIX RECOMMENDATION SYSTEM

INPUT:

- **User information –** viewing history, ratings, preferences, feedback, other members similar tastes, time of day you watch, how long you watch, devices used
- **Title information** – genre, category, release year, cast, director, language, duration, synopsis

OUTPUT:

- **Recommended Titles –** these are personalised to the user & ranked based on likely engagement & probability of the user watching these titles

SIGNATURE RECOGNITION

INPUT:

- **Images –** enhanced scanned or digital images of signatures without any distortion, capturing the features of the signature, such as line direction & overall appearance

OUTPUT:

- **Signature Verification & Identification –** comparing signature with a reference signature, as well as, classifying & identifying the person who made the signature from a set of known signatures

MEDICAL DIAGNOSIS

INPUT:

- **Patient Data –** demographic, medical history, symptoms, laboratory test results, genetic data, lifestyle
- **Medical Images** – X-rays, CT scans, MRI scans, histopathology slides
- **Clinical Data** – using other patient records to compare and cross reference to, such as similar characteristics, history and symptoms, as well as, clinical guidelines that provide evidence-based recommendations for diagnosis

OUTPUT:

- **Diagnosis & Probability –** identifying the medical condition, disease, risk factor or prognosis, along with a probability score, representing the likelihood of the diagnosis