



Vidyavardhini's College of Engineering and Technology

Department of Artificial Intelligence & Data Science

AY: 2024-25

Class:		Semester:	V
Course Code:		Course Name:	Artificial Intelligence

Name of Student:	Sainath Khot
Roll No. :	20
Assignment No.:	1
Title of Assignment:	Introduction to AI
Date of Submission:	18/7/24
Date of Correction:	29/7/24


Evaluation

Performance Indicator	Max. Marks	Marks Obtained
Completeness	5	03
Demonstrated Knowledge	3	03
Legibility	2	01
Total	10	07

Performance Indicator	Exceed Expectations (EE)	Meet Expectations (ME)	Below Expectations (BE)
Completeness	5	3-4	1-2
Demonstrated Knowledge	3	2	1
Legibility	2	1	0

Checked by

Name of Faculty : Miss Rujuta Vartak

Signature : 

Date : 29/7/24

Q.

=> When designing an AI for autonomous delivery drones in urban areas, it is important to define the PEAS [Performance measure, Environment, Actuators and Sensors] framework.

Performance Measure:

- 1) Delivery efficiency: Timeliness of deliveries, Minimizing ~~drift~~ delays.
- 2) Accuracy: Correctly delivering to intended address.
- 3) Safety: Avoiding collision with obstacles such as building, trees, wires, other drones, etc.
- 4) Energy efficiency: Minimizing battery consumption & maximizing flight time.
- 5) Compliance: Adhering to local regulations & air traffic control.

Environment:

- 1) Crowded urban areas with buildings, power lines, trees and other obstacles.
- 2) Variable weather conditions (wind, rain, etc.)
- 3) Potential interference from other
- 4) Interactions with pedestrians, vehicles and drones.

Advantages:

- ① Propellers / motors: For vertical and horizontal movement.
- ② Landing gear for safe takeoff & landing.
- ③ Grippers or compartments to securely hold & release packages.

- ① Storing mechanisms to control the drone's direction & orientation.

Sensors:

- ① GPS: For location tracking & navigation
- ② Camera's for object detection, obstacle avoidance & package delivery verification.
- ③ Altimeter & barometer for altitude & pressure sensor
- ④ Proximity sensors to monitor environmental obstacles.
- ⑤ Wireless communication module to receive delivery instructions & transmit status updates.

Q2

Ans Here's the PEAS for an autonomous taxi during rush hour:

Performance measure:

- ① Punctuality: Arriving at the destination on time despite heavy traffic.
- ② Safety: Avoiding collisions with other vehicles, pedestrians and obstacles.
- ③ Passenger Comfort: Providing a smooth ride with minimal abrupt stops or turns.
- ④ Compliance: Adhering to traffic laws and regulations.
- ⑤ Efficiency: Optimizing routes to minimize travel time and energy consumption.

Environment:

- ① Dense urban traffic with cars, buses, pedestrians and other obstacles.
- ② Variable road conditions (potholes, construction zones, traffic signals).
- ③ Changing weather conditions (rain, snow, fog).
- ④ Potential interference with GPS or wireless communication signals.
- ⑤ Operating within legal boundaries, including speed limits, restricted areas & parking rules.

Actuators:

- ① Engine / motor: For propulsion and controlling speed.
- ② Steering system: For maneuvering the vehicle.
- ③ Braking system: For decelerating and stopping the vehicle.
- ④ Suspension system: For ensuring a smooth ride.
- ⑤ Door mechanisms: For passenger entry and exit.
- ⑥ Communication system: For sending and receiving data to / from control centers and other vehicles.

Sensors

- ① GPS for real time location tracking and navigation.
- ② Camera for object detection, lane recognition & traffic signal identification.
- ③ Radar & Lidar sensors for detecting nearby vehicles, pedestrians and obstacles.

- ④ Ultrasonic sensors for proximity detection & parking assistance
- ⑤ Accelerometers and gyroscopes / gyrosensors for stability and motion control
- ⑥ Weather sensors to monitor environmental conditions such as rain, temperature, etc.