



Examiner Only

base d

12 Pages

Instructions to Candidates

1. Please give the information requested in the boxes below.
2. Enter your name in the space provided to the right, fold over and seal down (using the label provided) to hide your name.
3. The answers must be legibly written. The Examiners can either ignore illegible script or have it retyped and the expense of typing charged to the candidate.
4. Write your answers in ink.
5. Begin each answer on a fresh page. Do all rough work in the answer book and cross it through.
6. No part of this book is to be torn out; it must be handed in complete.
7. If more books than one are used, fasten them together using the tags available from the invigilator(s).
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1	Student Number	2410049
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5	Examination Venue	360
6	Seat Number	012
7	Number of Answer Books handed in	0

[illegible]

(Gweler yr ochr arall am y fersiwn Cymraeg)

31%
~~Adm~~
2018 January
2025

Section-B:-[06]

Q.4,

QA,

→ The devolving of CNN is totally based on the Deep learning.

⇒ In Deep learning there are many more hidden layers

→ The Deep learning consume more time to process and give output more accurate.

Key feature of it is,

→ CNN architecture

~~→ Feature Engineering~~

→ High usage of system powers.

Please underline the question and answer.

Now we will discuss about CNN architecture.

The CNN architecture is a Image classifier and we can say face recognition (Properly) the CNN for classifying objects captured by an camera, in real time the CNN identify correctly and classify a wide range of object, in it's surroundings in a AV

The Key Features:-

1. convolution layer

2. ReLU layer

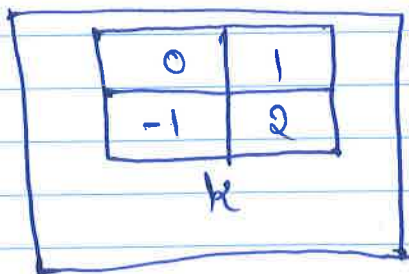
Activation function

3. Pooling layer
4. Fully connected layer
5. loss function.
6. Activation function.

Convolution layer:-

The convolution layer is based on the input image. It will scan the whole image and divided into n^{th} number of parts. depends on the image. It separates as boxes and and classified every box with the help of kernel (k-size) and divided into building blocks..

It separates the boxes and with kernel it save the box in a side to give final out it send to the next layer. by scanning the edges, layers, lines etc----



ReLU layer:-

In the input image ReLU plays a significant role like, it will connect the whole path from input to output. It will create a map which connect the whole layers of the image to give the final output.

ReLU is one of the activation fn.

ReLU is the role of activation fn.

Pooling layer:-

The Pooling Layer has maintain the layers and adopt the whole necessary inputs and give to the connected layers. The Pooling layer with simultaneously do the work for fill the empty space and add every boxes in the layer to analyze the image.

Fully connected layer:-

It will connect the all layers accordingly to the separated boxes to analysis and give the final output for identify the image. It helps a lot to that. For giving a output with the analyzed data. It plays a crucial role to connect each and every divided box into a single frame again and generate and give the object as correctly. It is reliable and effective.

provide proper definition

Loss Function:-

It will Rearrange the inputs as expected to the final out. If some boxes in b/w any of the missing or the analyzed image as to building blocks. It will recalculate the data in the image and resubmit to output.

To calculate the predicted error!

Output classes:-

after completion of each block in CNN it will show the image identity as expected output. Yes or No. If it matches the data it will show yes it a dog. If not it shows not a dog.

Section A:- ~~Q~~ 13

Reinforcement learning:-

The Reinforcement learning is based on the Agent interacts to the environment with the strategies and balanced methods.

⇒ The RL will make the outcome as to giving feedback to the action done in a environment

⇒ If the action done good and effective in a certain way it will give Reward.

⇒ If the action in environment not satisfy ~~the~~ with it or needs to improve, improved results it gets Penalty.

Ex: If dog do what the person says or when through a stick to distance it will bring it back in active and safely. It will get rewarded. For good. Likewise if it done and had or didn't listen to the person it will get penalty or it get beaten like that.

Provide a relevant example that matches it

⇒ ~~For this case~~ Agent, Environment, Action, Feedback, Policy

Answer a question

① The key elements of reinforcement learning.

1. agent
2. Environment
3. Action

Please number all questions

4. Feedback State
3. Policy.

It could be better to connect each element and its roles to the function of AVs.

agent $\Rightarrow$ The decision maker or learned data

Environment $\Rightarrow$ The area that agent used for ^{internal} action is a Environment

Action $\Rightarrow$ The Action done by the agent in the Environment

Feedback $\Rightarrow$ getting ^{reward} or ^{penalty} ~~loss~~ done by agent in Environment

Policy $\Rightarrow$ The Path ~~choose~~ or the decision ~~took~~ for the action.

$\Rightarrow$ In autonomous vehicles the ~~all~~ elements interact to ensure effectively and adaptive drive to the destination. by using these.

For AV in reinforcement learning the environment has to be updated back to back. The agent has to make decision to choose a Path for travel to Place. It needs to a Idea to know the roads distance, road conditions, traffic conditions, estimated time etc., By checking this it shows the possibility's to reach. after agent choose it need to rely on the camera and sensors are available. By analysing the whole it will OK to go. the vehicle control in autonomous driving it has already learn and trained all kinds of environments for direct driving

- ⇒ By following the Principles and taking all kinds of safety measures it should suitable situations. It will adapt the all kind of environment by relying on his sensors and cameras and etc--- by different kinds of climatic conditions, traffic conditions, checking all the possibilities for safety and taking continuous and ~~not quick~~ making a decision.
- ⇒ like a supervised learning the data is standard and input will give and direct by AI. It uses the labeled data. ~~For~~
- ⇒ And also it's rely on unsupervised learn. data also it learn from unlabeled data. For making a decision in a unpredictable situation's, emergencies, applying brakes, etc--- for safety.
- ⇒ By checking the Environment of classification algorithms and regression algorithms. It makes both numerical and categorical values. by ~~the~~
- ⇒ while driving sensing the objects, predictions, signals, lines, traffic conditions, it has full control on the Surrounding of it. then it can make effective and adaptive driving.

QA

just ~~not~~ follow the numbering system used in the question page

The autonomous driving has a both labeled and unlabeled data for making the decisions by classification and regression. It has to be maintain ~~the~~ and depends on the sensors, and cameras, radars, By taking a shortest path and taking safety measures the vehicle controlling as a basic principles. It is updating day by day and implementing the rules and strategies. It learning day by day from the environment through direct interaction.

By analysing the conditions of Environment, conditions of roads, recognizing the objects, lines, signals, Pedestrians, maps, accidents, speed of the vehicle and Rules, traffic rules, safety measures, applying Brakes, in sudden situations making sudden Decisions, which prevent accidents and collision with other vehicles or objects.

ex- following the traffic signals. If sign is red or green or yellow. It has to be senses ~~the~~ and be aware of the Pedestrians, recognizing the colours. Possibility to stop colour is in Red. If Red stop the vehicle No, move the vehicle or, moving the car. If Possibility Yes or NO colour is in Green, go or else stop the vehicle. Likewise every situation has to be sense and be aware of surrounding that. It can make its own decision.

after getting successful It can be rewarded by giving ~~a~~ Positive or Penalty for negative.

do not
Please mix & match answers of
each keep all answer of each
Section Separately

Section - B

Q1. CNN :-

The roles of depth, stride and padding in CNNs and these parameters specifically influences the performance and behaviour of CNN-Based Perception Systems in AVs. is tasked with developing a CNN for classifying objects captured by an autonomous vehicles front camera. In real time, the CNN must correctly identify and classify a wide range of objects including cars, people, traffic signs, and obstructions the network to be deployed in a resource data constraints design is reliable and effective.

actual are / in roles of depth, stride and padding

The image classification of building blocks in CNN the Pooling layer as set the total image to be filled with possible outcome of every dimensions of an input image of size with a convolutional layer parameter of 3x3 filters of size and strides and padding. The parameters specifically in depth, stride, and padding, performance and behaviour of CNN-based on system the context of autonomous vehicles, of functions the advantages of layers in terms of dimensionality and translation in the domain of motion planning for Autonomous vehicles (AVs). ~~tradition~~ the optimization models have been extensively used to compute paths that satisfy certain constraints in handling more complex and dynamic scenarios in motion.

A lot of irrelevant information provided but there are not relevant in role of padding, depth & stride

The convolutional neural network (CNNs) performs better in real-world AV scenarios such as managing real-time processing and to dynamic surroundings to ~~utilize~~ utilizing for motion planning in AVs, and also they developing at a rapid pace. to control the the key function which enable and specific technologies used. powered by strong AI

Section A:- [03]

Q1,
bA

The self driving car powered by strong AI. the capabilities has become great rather compare to the weak AI system. It will change the whole perspective of things by making it we can rely early on the AI. for self driving. because the facilities and things like Perception, Prediction, Planning and control function in AVs. will be changed. and also the Prediction, Planning and control are the key ~~features~~ ^{via} AI functions in major AV system.

Are you not understanding this question?

By strong AI the complex driving situations would significantly change and by learning and from technical and more interacting it will ^{get} more capable to understand the situation and making a continuous decision in a emergency situations and also it increase its sensory abilities for recognising the objects, people, lines, mapping, traffic conditions, traffic signals, animals, climatic conditions It can be more accurate and create as per the situation to avoid collision and maintains the safety.

and also it can adapt to the situation and learn ^{and} the analysis the situation instantly and take a own decisions the environment check like night drives and climatic conditions, rain, seasonably take ~~the~~ Recreation according to the situations. It can provide accurate and take necessary steps and simplify the complex queueing into simply and solution. It can handles the specific conditions as aspects of ~~the~~ customers services. and generate several analysis.

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