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Deep-Q learning with Self-Driving Car

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Abstract: Street Transport is generally one of the perilous methods for transport accessible today, yet everybody utilizes this mode to travel. Self-governing driving assists with diminishing the quantity of mishaps worldwide by a huge sum. It likewise causes people to be increasingly effective and help them to invest less energy voyaging. Self-governing vehicles speaks to mechanical disclosure that may offer answers for current transportation issues and significantly change how individuals approach versatility. Self-driving vehicles do can possibly help wellbeing and improve personal satisfaction; a considerable lot of us seem hesitant to embrace the innovation since they are awkward with security, liabilities, and control.

Keywords: deep convolution; q learning; doom; artificial intelligence; virtual reality

I. INTRODUCTON

With the current speedy development in mobile robotics, the applying of way coming up with mobile robot technology in an unknown atmosphere is paid a lot of assiduity by specialists. robot is used in finding out the atmosphere and create call by itself. But, does the robot learn from the given environment? So, an optimum solution would be Reinforcement learning, during which an agent will interact with an atmosphere by regular trial and error in its unknown atmosphere.

Many advancements are made during this field recently, with researchers effectively creating working systems which might be taught to drive on and off roads, avoid obstacles.

Artificial intelligence has always been considered as a tool which can help to improve the society in various aspects. Artificial intelligence, when integrated with other powerful technology like Virtual reality helps to create such an environment, where we can set up a virtual organization with least resources.

The project integrates intelligent agent system along with virtual reality(VR) to create a virtual environment which will be capable of performing real world organizational tasks by reducing the manpower as well as creating an easy-to-communicate interface. Proposed work performs self-drive a car using AI in given condition.

II. LITERATURE SURVEY

Quantities of investigates have been done as it has become extremely compelling point and has been picking up statures of expanding premium. Different method and algorithm are used to get good accuracy on AI queries, AI management, reinforcement learning, virtual reality and artificial intelligence.

Table 1. Shows the literature survey and research gaps of the self assisted systems using AI and VR.

Table 1. Literature survey

No	Paper& year	Key Findings	Research Gap
1	Natural language processing in VR training environments [1] [2014]	-Creation of intelligent assistant and training systems with combination of NLP and VR -Increases retention	Sometimes fusion leads to errors
2	VR for education and workforce training [2] [2013]	Measures user performance and user's experience in a virtual situation which is hard to accomplish in reality.	Test system infection is a typical issue with computer-generated reality. It isn't unexpected to have dropout paces of 10% to 20% and we have watched dropout rates as high as half
3	Making of real time intelligent interactive virtual environment [3] [2010]	Generates terrain from height map and filtering.	Merging of virtual Environment and autonomous virtual humans may lead to errors.
4	Application of artificial intelligence on machine learning [4] [2015]	Automatic indexing for boolean information retrieval system. Semantic annotation Of ubiquitous Learning environment.	Required skills of practices labors for this task
5	Agent supported serious game environment [5] [2016]	This exploration proposed and Assessed a specialist bolstered genuine Game conditions for a 3D community oriented game in kick the bucket open-sim Stage including University understudies.	The agent operate in discrete mode and applied to reduce cognitive overload.
6	Multiple object recognition with visual attention [6]	Proposed work presents an attention-based model for recognizing multiple objects in images.	Requires deep recurrent neural networks

	[2015]		
7	Deep reinforcement learning with double q-learning [7] [2015]	The proposed paper tells about the problem of overestimation in DQN algorithm, it presents a new way to solve this problem by using double q learning algorithm	Uses doubly q learning network instead of using deep q learning
8	Dueling Network Architectures for Deep Reinforcement Learning [8] [2016]	The proposed study shows a new neural net, which shows huge improvements in Atari domain artificial intelligence by decoupling values and advantages in DNQ.	Does not work with fps games, requires Atari games to work on
9	Deep learning for real-time Atari game [9] [2014]	The proposed study presents a new way to make an Atari playing agent which outperforms DQN, this is achieved by making the use of slow planning based agents, which provides data, it is able play in real-time.	Does not use DQN, requires run time training of the agent

III. METHODOLOGY

Artificial intelligence used to develop self-driving car with the help of artificial intelligence integrated agents by using Deep-q. The system uses Spyder for GUI purpose and Pytorch as a library to support the AI as it is build in python. Neural network are introduced here to further improve the performance of AI.

Car is created using virtual environment using Spyder. Input taken from user as drawing and processed by using neural language processing. User input converted into digital signals and then bots are trainend to perform various operations and manipulations.

SpyderGUI takes input asa sequence of sand (line drawn by user as input) and generates an output sequence of sand.The agent detect the sand from its three sensor,this sand acts as an wall for the agent which it has to avoid.If the agent hit the wall,the rewards that the agent get adjusted acoordingly.

Figure 1. Show s the training of neural network.

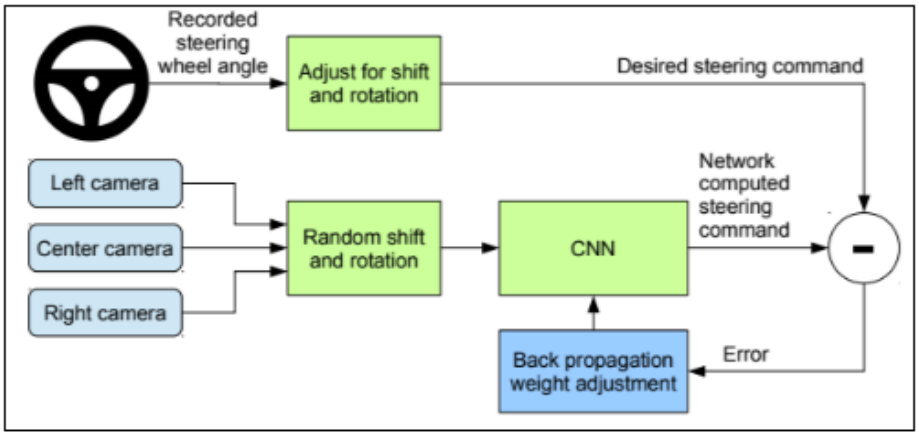

Figure 1. Training neural network

IV. RESULT

Developed an intelligent agent-driven system in Virtual Reality that executes Self-driving car model with the help of deep neural network. It achieves greater precision with deep-q model.

Figure 2. show output of self driving car.

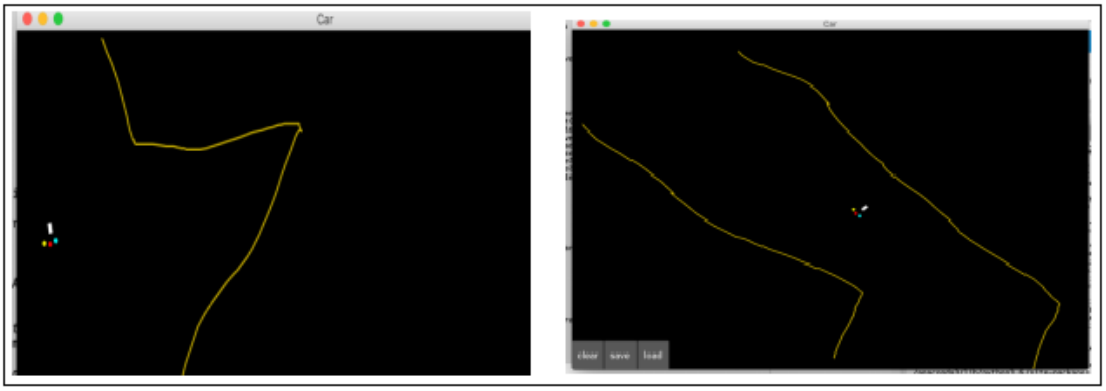

Figure 2. Self driving car output

XII. CONCLUSON

The system works by creating a virtual environment using Spyder in which we create car that can take input from user as drawing and that input can be processed by using neural language processing to convert drawing to digital signals and then training the bots to perform various operations and manipulations on already created drawing.

The system can help a user who has no previous knowledge about AI and perform AI queries on neural network just by using speech-as-an-input methodology. This environment can help to reduce the load of tasks like data entry, data manipulation in corporate offices and educational institutes.

XIII. FUTURE SCOPE

Future scope is to make a highly interactive artificial intelligence 3D virtual environment that can be used to achieve much more complicated tasks and creating more intelligent AI bots for computing and processing much more intricate data. This would help to complete demanding tasks by using artificial intelligence.

This system can be implemented for future AI car where car can drive in streets with proper efficiency and without any error and make live of people more easier and modern. This system is also adapted in Tesla in higher scale

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