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AUTONOMOUS MINI TANK PROJECT

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Abstract:

We are making an autonomous Mini Tank which is able to automatically advance our border area and guard our area. We are using the concept and Self Driving CaR and Computer Vision for moving and image processing. The AI based tank will be helpful to keep a vigil eye on our borders. The vehicle operates without live human presence. this will be utilized in many places where it should be not convenient, extremely dangerous, or impossible to possess a person's operator present like borders.

Key Words : Autonomy, Autonomous, Self-driving, Transportation, Ride-hailing, Sharing Economy, Dominant Design, Business-Models

Introduction:

We are making an autonomous Mini Tank which can automatically advance our border area and guard our area. We are using the concept and Self Driving CaR and Computer Vision for moving and image processing. The AI based tank are going to be helpful keep a vigil eye on our borders. The autonomous vehicle operates without an onboard human presence.The AI based tank are going to be helpful keep a vigil eye on our borders. This vehicle operates without an onboard human presence. This Tank will have a group of sensors to watch the environment, and may either autonomously make decision about its behavior or pass the specified information to a person's operator at a special location who can control the vehicle through tele operation. it'll even use the concept of Computer Vision to detect objects or humans within the border area. This vehicle are often an aide. This vehicle are often wont to do various activities in military and defense sector.Driving intelligence may be a very huge complicated complex thanks to all of the processes that are happening within the background. the potential to spot all of the required objects and sense them correctly is extremely important but the system can't rely only on sensing of the environment. Having the power to define

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vehicle's localization with accuracy at maximum and mapping the traffic structures along the way is equally vital. Concepts getting used during this project:

i. Tensor Flow:TensorFlow is an open-source ML (Machine Learning) framework for all developers. it's used for implementing machine learning and deep learning applications.

ii. Keras:KERAS is an Open Source Neural Network library written in Python that runs on top of Theano or Tensorflow. it's designed to be modular, fast and straightforward to use.

iii. iii. Computer Vision:Computer vision is an interdisciplinary scientific field that deals with how computers can gain high-level understanding from digital images or videos. From the attitude of engineering, it seeks to know and automate tasks that the human sensory system can do

iv. iv. Python:Python may be a general-purpose interpreted, interactive, object-oriented, and high-level programing language.

v. v. Deep Learning:Deep learning may be a class of machine learning algorithms that use several layers of nonlinear processing units for feature extraction and transformation. Each successive layer uses the output from the previous layer as input.Deep neural networks, deep belief networks and recurrent neural networks are applied to fields like computer vision, speech recognition, tongue processing, audio recognition, social network filtering, MT, and bioinformatics where they produced results like and in some cases better than human experts have.

vi. vi. Neural networks: Neural network may be a sort of machine learning which models itself after the human brain, creating a man-made neural network that via an algorithm allows the pc to find out by incorporating new data.While there are many AI algorithms lately, neural networks are ready to perform what has been termed deep learning. While the essential unit of the brain is that the neuron, the essential building block of a man-made neural network may be a perceptron which accomplishes simple signal processing, and these are then connected into an outsized mesh network.The computer with the neural network is taught to try to to a task by having it analyze training examples, which are previously labeled beforehand. a standard example of a task for a neural network using deep learning is an visual perception task, where the neural network is presented with an outsized number of objects of a particular type, like a cat, or a sign, and therefore the computer, by analyzing the recurring patterns within the presented images, learns to categorize new images.

MAIN OBJECTIVE: *In the time of war, within the combat zone, we don't got to send our soldiers in battle field. we will send these tanks in war field which may fight on their own and our army can control them by sitting at a distance from combat zone. this may save our soldiers and help our country to prosper. Potential problems of Autonomous vehicles: AVs can increase costs associated with additional car equipment, services, and further maintenance, and further investments in infrastructure are going to be also necessary. AVs may introduce new risks, during a sense of system*

failures which will occur. What can mean that AVs might be less safe in certain situations and conditions. Being connected to a cloud and operated by a central unit system, there'll be security and privacy concerns associated with cyber security threats, where vehicles are often controlled remotely. Further vulnerable abuse of data, tracking and data sharing could violate the passenger privacy and people cars might be used for a few terrorist activities

APPROACH TO THEORY DEVELOPMENT:

This study is predicated on deductive theory development, that use the tutorial literature for the idea development. supported the premises from the idea, the collected knowledge and premises are within the research: tested, applied and validated. deduction is predicated on a logic, where within the process of reasoning from one or multiple premises we should always come to a logically predictable conclusion. during this paper, the knowledge from the idea are going to be validated with the collected data from case studies and reports. The individual findings within the analysis will reflect the patterns observed during a literature review. As a methodological choice, the study is using qualitative research design that helps us to review the behavior and patterns that shape the longer term of the on-demand transportation nowadays. Figure 2.2. represents the overview of the study and it's continual flow. The study has also exploratory design because the paper is identifying the present situation within the market and is trying to attach the variables and relationships between the most stakeholders for the longer term of the autonomy and on-demand transportation. "The emphasis in explanatory research is to review a situation or a drag so as to elucidate the connection between variables."[9] Analyzed data are going to be gathered from different literature sources, both primary and secondary literature sources. Academic papers, publications, reports, conference papers and case studies were sourced from a primary literature. along side secondary literature sources like articles, conference keynotes, journals, etc.

Figure 2.2: Overview of the Empirical Study

Reading guidelines:

Purpose of this part of the paper is to get familiar with an outline of the study, and understand the context of individual chapters.

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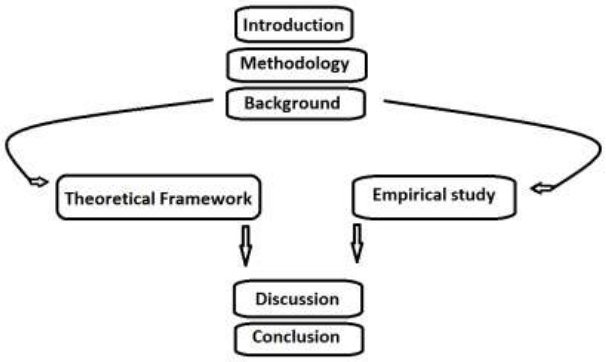

Figure 2.3: Structure of the study

Definitions:

Autonomy:

Autonomy, the power or a state of being self-governing; acting separately from others. Applied this idea on cars, represents vehicles that are ready to operate with none human interaction, by using AI.

Self-driving vehicle

Self-driving vehicle Any vehicle with kind of features that allow it to steer a course, accelerate and separate partial or no driver interaction. Autonomous vehicle Can drive itself from point A to point B, without the necessity of any interaction from the driving force. The autonomous vehicle is in a position to maneuver in space due ability to sense it's close the environment, detects and identify the objects and environment around. Being capable of building the environment model and determining the precise location of location by using global positioning system enable an autonomous vehicle to maneuver around. Along the Sensing and Mapping, Driving Policy determine how the vehicle is working on a road. Autonomous vehicles have the potential to eliminate the driver's errors, they aren't operating intoxicated and that they don't get tired. Yet, there are many challenges that must be acknowledged and fulfill so as to supply autonomous vehicles with maximum safety to the general public.

Fully Autonomous

Fully autonomous are actually divided into user-operated and driverless vehicles. It's mainly thanks to a regulator and insurance questions.

REQUIREMENTS:

1. Arduino Uno:

Arduino/Genuino Uno is a microcontroller board based on the ATmega328P. It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz quartz crystal, a USB connection, a power jack, an ICSP header and a reset button. It contains everything needed to

support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started..

2. Raspberry Pi Model 3 B+:

Raspberry Pi 3 Model B+, the latest product in the Raspberry Pi 3 range.

3. Stepper motor:

A Stepper Motor or a step motor is a brushless, synchronous motor which divides a full rotation into a number of steps. Unlike a brushless DC motor which rotates continuously when a fixed DC voltage is applied to it, a step motor rotates in discrete step angles.

4. Stepper motor hat:

This HAT supports up to 2 stepper motors. The python library works identically for bi-polar and uni-polar motors Running a stepper is a little more intricate than running a DC motor but its still very easy

5. Power supply
6. Iron
7. Wheels etc.

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The thesis addresses development of autonomous vehicles and their future implications in a sharing economy. Right now, autonomous vehicles are still in a research and development phase, but numerous of powerful stakeholders are already forming partnerships in order to strengthen their position on future transportation markets.