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IOT Based Safe Transportation Route

[1]Neeraj Manhare ,[2]Suniti Purbey

[1]Amity Institute of Information Technology, Amity University Chhattisgarh, Raipur,

[2]Assistant Professor, Amity Institute of Information Technology, Amity University Raipur, Chhattisgarh

ABSTRACT:

Route planning for military vehicles in an uncertain military environment is a special type of route planning problem, as military vehicles are subjected to major uncertain and unexpected attacks. This paper modeled this road network uncertainty with a set of different scenarios. The shortest route is introduced to find fixed routes from the point of departure to the destination of each vehicle. A binary number system is introduced to create a problem. Since the combination of uncertainty results in a large number of cases, we used a moderate sample measurement method to find a solid solution to the problem. The solution method is shown and tested in a series of three different dimensions. Calculation results show that, in small scale networks, our method can provide a good solution with a small sample size, whereas, in a large network, with a small sample size, this method often leads to a lower resolution, but a better solution is still available as sample size grows. Additionally, a different deviation trend with a different sample size indicates that a larger size sample can bring more stability to the results.

Keyword- arduino uno, ultrasonic sensor,micro servo motor sg90,battery

INTRODUCTION:

During wartime, Military Ground Vehicles (MGVs) usually have to move from their rear bases or hidden areas (origins), go through a series of complex routes, and reach pre-determined areas (areas) to complete their missions, such as in Illustration. 1. For example, rocket-propelled grenades move from military bases to arrowheads to complete the launch campaign. In general, the origin is well-established and hidden, which can ensure the safety of MGVs. However, when MGVs move from and to the road network, they may be detected by enemy surveillance sensors. Due to the lack of reinforcement and concealment facilities, MGVs face man-made attacks while traveling on a network of roads. Such attacks, especially those caused by landslides and air raids, are more likely to occur on the battlefield. In fact, according to the South Asia Terrorism Portal (SATP) [1], there were 309 attacks on North Atlantic Treaty Organization (NATO) transport in Pakistan from 2008 to 2014. The death toll from such attacks reaches 143. The problem of mobility on networks that are prone to attacks is especially important because of the many war zones currently in the world. According to data provided by the Global Security Organization (GSO) [2] there have been 35 major ongoing wars and more than 25 minor conflicts worldwide by the end of 2015. All of these regions often attack where the enemy is attacking. military personnel and vehicles traveling on road networks. Therefore, fine-tuning of MGVs routes in an uncertain military road network, in order to reduce the risk of attacks, is an important issue to be studied in the military field. In CMP, there is a set of columns with a specific pair of location and location (OD). The aim is to find routes for all convoys that reduce the total travel time while adhering to other strategic barriers [6]. Time is a very important factor in this problem as modern military involvement underscores the need for more mobility [3]. However, if we are considering planning a work-related route, MGVs are not required to complete the administrative task as quickly as possible but must reach their destination prior to the machine deadline. Therefore, in this paper we will look at the timing of each MGV route as a stronger barrier than the cost target. Given the deadline for these machines, all MGVs involved in directing are requested to arrive at their destination within a time limit on this timeline.

Another important feature of the MGV route tested is that the destination of each MGV is unlimited and there are a number of MGV selection points, which are very different from one OD pairs to one in the CMP. The destination is an important MGV decision, which can be developed in line with routes. This is a real requirement for military service; for example, there is usually a set of possible triggers for portable arrow operators to complete their task

and the final launch location should be determined according to the nature of the battlefield and road network. Thus, the problem with the MGV route involves two main components: for each car, select the destination between the candidate areas and the route between the shorter routes between its origin and destination.

The emergency exit problem is related to the choice of shelter and the arrangement of the evacuation route, which removes people from the exits (areas affected by natural or man-made disasters) and transports them to exits (safe havens) [7]. The exit problem is related to our research in the area and route decisions, but a lot of work in this field does not need to consider unsafe attacks during movement on the road network. A complete review of this article can be seen in the work of Altay and Green III [8] and Galindo and Batta [9].

In the exit problem, there are usually a few candidate shelters and a provided road network with a strong deterministic delivery to the arc of each street. The decision maker should determine the appropriate shelter and select the routes for all exits to cover the cost of exit and efficiency. Yamada [10] designed the city road network model as an indirect graph, and by solving the problem of the shortest route on this graph, they found an appropriate exit plan to assign each city resident to one of the shelters. Cova and Johnson [11] focused on traffic delays that occur at intersections. To alleviate these delays, they introduced a network flow model to identify the best route trips on a complex road network. Aside from the network-based approach, the th-shortest-path method is one of the most widely used method of exit problem. Campos et al. [12] first introduced this method of allocating vehicle flow in emergency transport planning. Their goal is to send a large number of vehicles in a short period of time outside the region under the threat of a certain accident. Stepanov and Smith [13] used government-based line models to deal with congestion and time delays in arcs. In their model, a set of possible and possible exit routes is defined by a very short path algorithm. Yena et al. [7] introduced a very short exit based approach to the analysis of police resources allocated to the transport network. They have proposed a mixed system to reduce the total exit time. In general, the main purpose of the exit is to reduce the total travel time, and uncertainty in the exit problem often arises due to the congestion and time delays that occur at intersections or intersections

METHODLOGY:

ULTRASONIC SENSOR:

Ultrasonic sensor is a tool that measures distance to an object using ultrasonic sound waves. The ultrasonic sensor uses a transducer to send and receive ultrasonic pulses that relay information about the proximity of an object. Ultrasonic sensor is one of the best ways to hear proximity and detect high levels of reliability. Our technical support receives regular emails about how our senses work and where our senses work (or do not work).

This guide was created as an introduction to the ultrasonic sensor, its principles, and how ultrasonic sensors work in your applications. At the highest level, you need to know what an ultrasonic sensor is

Ultrasonic sensors operate by sending sound waves at a frequency greater than the human hearing range. The sensor transducer acts as a microphone to receive and transmit ultrasonic sound. Our ultrasonic sensors, like many others, use a single transducer to transmit heart rate and echo. The sensor determines the distance to the target by measuring the time between sending and receiving the ultrasonic pulse. The working principle of this module is simple. It sends an ultrasonic pulse out at 40kHz through the air and if there is an obstacle or object, it will jump back into the sensor. By calculating travel time and sound speed, distance can be calculated. Ultrasonic sensors are a good solution for the detection of clear objects. By measuring the liquid level, applications that use infrared sensors, for example, struggle with this specific use due to the directed light. To detect presence, ultrasonic sensors detect objects regardless of color, surface, or material (unless the material is as soft as wool, as it can absorb sound.) To detect obvious objects and others where visual technology may fail, ultrasonic sensors are a reliable choice.

How are Ultrasonic Sensors used : Our ultrasonic range sensors, level, and nearby sensors are commonly used with microcontroller platforms such as Raspberry Pi, ARM, PIC, Arduino, Beagle Board, and more. Ultrasonic sensors transmit sound waves toward the target and will determine its distance by measuring the time it takes for the reflected waves to return to the receiver. This sensor is an electrical device that will measure the target distance by transmitting ultrasonic sound waves, and then converting the reflected sound into an electrical signal. Our nerves are often used as nearby nerves. Ultrasonic sensors are also used in systems to avoid obstacles, as well as in production. Our ShortRange sensors offer the possibility of getting a near distance where you may need

a sensor that covers objects close to 2cm. These are also built with very low energy requirements in the brain, as well as areas where noise resistance is required.

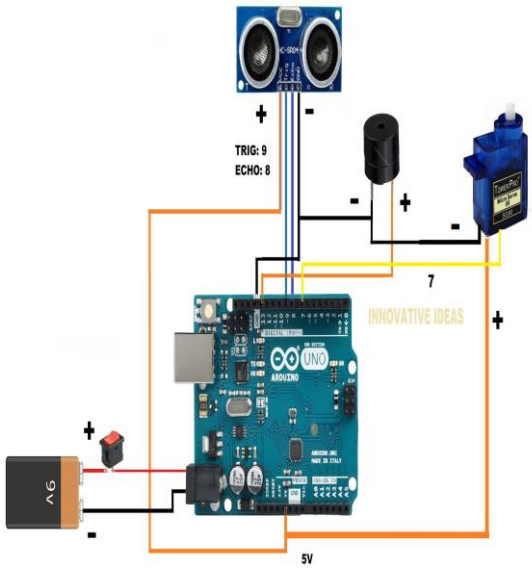
AURDINO MEGA:

Arduino is a portable open source computer platform based on a simple i / o board and development environment that uses Processing language / Cables. Arduino can be used to develop stand-alone collaborators or can be connected to software on your computer (eg Flash, Processing, MaxMSP). Open source IDE can be downloaded for free (currently for Mac OS X, Windows, and Linux).

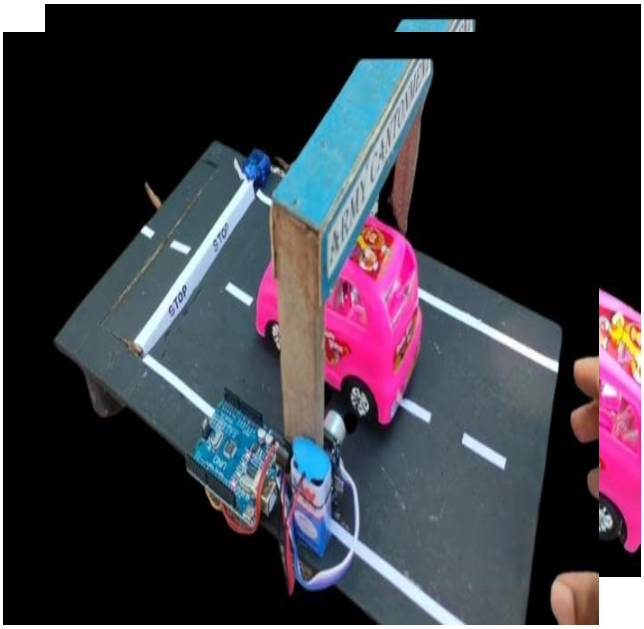
Arduino Mega is a microcontroller board based on ATmega2560. It has 54 digital input / output pins (14 of which can be used as PWM output), 16 analog input, 4 UART (hardware serial ports), 16 MHz crystal oscillator , USB connection, power jack, ICSP header, and reset button. It contains everything needed to support a microcontroller; just connect it to a computer with a USB cable or power it with an AC-to-DC adapter or battery to get started. Never be afraid to unplug it, because Mega includes basic plastic to protect it! Mega 2560 R3 also adds SDA and SCL pins near AREF. In addition, there are two new pins placed next to the RESET pin. Another IOREF that allows the shields to match the voltage given to the board. The other is not connected and is set for future purposes. The Mega 2560 R3 works with all existing shoes but can adapt to new shoes that use these additional anchors.

Micro Servo Motor SG90:

Micro Servo Motor SG90 is a tiny and lightweight server motor with high output power. Servo can rotate approximately 180 degrees (90 in each direction), and works just like the standard kinds but smaller. You can use any servo code, hardware or library to control these servos. Good for beginners who want to make stuff move without building a motor controller with feedback & gear box, especially since it will fit in small places. If motor is powered by a DC power supply then it is called DC servo motor .



Result analysis:



BLOCK DIAGRAM:

Advantages:

•it use illegal smuggling to solve

•require lower men power to conduct checking vehicle

Conclusion:

In this paper, we addressed the trouble MGVs maneuver in unsecure street networks in battlefield environment. We describe the uncertainty of the community based totally on discrete eventualities and introduce the th-shortest-path approach to calculate the feasible paths between origins and destinations. The hassle is formulated into a binary integer programming model. Due to the large wide variety of situations generated with the aid of the mixture of unsure arcs, we proposed a SAA technique to remedy the model. Experiments primarily based on three networks with specific scales had been carried out to take a look at the effectivity of the answer approach. Computational consequences exhibit that greater pattern brings applicable development of the approximation and an applicable growing in computational complexity.In our paper, we did no longer think about the fortification or camouflage aid for the maneuver, and we solely want to figure out routes for all vehicles.

Feature work:

•Different type sensor to detect bomb helmet etc.

•fast tag add to this project

•overloading vehicle to solve

•high speed vehicle to control

• detection system to solve alcohol driving

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