International Journal of Computational Science and Engineering Research
ISSN: 3107 -8605 (Online) , http://www.ijcser.com/
Regular Issue , Vol.1, Issue. 3 (July – September) , 2024 , Pages: 18 - 22
Received **:** 25 April 2024 **:** *Accepted* **:** 09 May 2024 ; *Published* **:** 23 July 2024
https://doi.org/10.63328/IJCSER-V1RI3P5
Original Paper : Applied Research – Compare and Contrast Research Paper

Conceivable Outcomes of Correspondence between the Artificial Intelligence and Battle Vehicle

M Karunakar Reddy [1], **Y Reddy Prakash** [2], **Y Srikanth** [3], **C Reddy Prasad** [4], **S Shuaib Akthar** [5], **V Naveen Kumar** [6]

[1-5] Department of Electronics and Communication Engineering , Aditya college of Engineering, Madanapalle, India

** Corresponding Author: M Karunakar Reddy ; karma0102@gmail.com*

Abstract: The upside of man-made intelligence and Battle vehicle is the high level abilities of raspberry pi and Arduino uno microcontroller to address deficiencies present in existing security and reconnaissance arrangements. By coordinating a Pi Cam 8MP with Raspberry Pi 4B, the framework accomplishes upgraded gatecrasher recognition exactness. Upon location, a servo engine quickly situates a laser for exact focusing on, fundamentally working on functional proficiency. Supplementing this, a ultrasonic sensor, combined with picture handling methods, further refines discovery capacities, empowering the framework to precisely perceive dangers. In addition, the consideration of GPS innovation guarantees powerful gadget confinement, supporting both functional viability and framework recuperation in the event of misfortune or removal during crucial undertakings. The Arduino uno microcontroller serves the headquarters unit, it organizes the framework works and lodging fundamental projects, in this manner improving on it to make it more productive and programming process. These progressions all in all enable the framework with that outcomes from the rehashed estimation of a realized worth will be generally comparative outcomes under similar conditions, and having various abilities or characteristics, and independence, defeating the limits of customary security arrangements. By the activity or cycle of joining together or combining at least two things state of the art equipment parts and insightful calculations, the proposed framework is utilized to expand the security conventions and reconnaissance.
Keywords: Robotics, IOT, Raspberry Pi, Laser, Ultrasonic Sensor, GPS.

1. Introduction

The task involves a security robot using a Raspberry Pi 4B to recognize and distinguish gatecrashers with a Pi Cam 8MP, communicating information for handling. A servo engine coordinates a laser framework for exact focusing on. A GPS module decides the gadget's area for functional effectiveness and recuperation. A ultrasonic sensor supports distinguishing objects, with information handled utilizing Python picture handling to recognize possible dangers. An Arduino Super organizes the framework's parts, controlled by a 12V battery for continuous activity. The undercarriage consolidates an engine driver and two DC engines for development. Key data is shown on a LCD, and IoT reconciliation takes into account remote observing and control, improving situational mindfulness and versatility to mission needs. The undertaking means to foster a flexible security robot equipped for recognizing and killing gatecrashers. With its Raspberry Pi 4B processor and Pi Cam 8MP, the robot can distinguish dangers and communicate information for investigation. The expansion of a servo engine controlled laser framework upgrades its guarded capacities. Consolidating a GPS module guarantees powerful activity and helps in recuperation. The ultrasonic sensor upgrades danger location, while Python picture handling further develops danger recognizable proof exactness. The Arduino Mega microcontroller incorporates and controls the framework parts, guaranteeing productive execution. The task's extension incorporates constant input through a LCD and IoT combination for remote checking and control, upgrading by and large security adequacy.

2. Related Work / Literature Survey

Qijia Yun, Bifeng Song, And Yang Pei (2020) Modelling the Impact of High Energy Laser Weapon on the Mission Effectiveness of Unmanned Combat Aerial Vehicles With the fast improvement of high energy laser weapons (HELWs), the incorporation of HELW on automated battle

ISSN: 3107 - 8605 (Online) , http://www.ijcser.com/ , Vol. 1, Issue 3, 2024, https://doi.org/10.63328/IJCSER-V1RI3P5

flying vehicles (UCAVs) has turned into a hot examination subject. To concentrate on the effect of HELW on UCAV mission viability, this paper proposes a 4-level plan structure in light of the arrangement of-framework (SoS) situated plan. To approve the system, the effect of HELW is broke down in four viewpoints: the strike ability, the covertness execution, the weakness, and the protections capacity, where the UCAV configuration obliges are noted. Reenactment examinations of entrance situation are done utilizing specialist based demonstrating and recreation. The reproduction results demonstrate the way that the incorporation of HELW can build the survivability and mission adequacy rate (MER) of the UCAV, particularly for UCAVs with rapid and secrecy execution. Be that as it may, the MER of the UCAV doesn't increment with the increment of HELW yield power by and large, demonstrating the significance of adjusting the HELW and UCAV exhibitions in idea plan

Shi Feng, Jungian Xi, Xin Xing Mu, Cheng Gong (2021) A Collaborative Decision-Making Approach for Multi-Unmanned Combat Vehicles based on the Behaviour Tree, Focusing on the trouble of powerful conduct decision-production in multi-automated battle vehicle frameworks under complex conditions and perform various tasks conditions, in view of dissecting existing automated vehicle conduct choice frameworks, this paper proposes a multi-automated battle vehicle helpful conduct choice strategy in light of the conduct tree. In this paper, we portray the conduct tree displaying strategy for a multi-automated battle vehicle cooperative social choice framework, examine the general course of social tree displaying, and show the viability of the technique by carrying out a multi-automated battle vehicle cooperative social choice in view of the Loot ace computer based intelligence robot.

Shuai Wang (2019), Yu Zhang*, Zhiyong Liao building Domain-Specific Knowledge Graph for Unmanned Combat Vehicle Decision Making under Uncertainty with the improvement of shrewd conflict, automated vehicle assumes an increasingly more significant part later on war. As a significant piece of the ground automated vehicle framework, automated battle vehicles have been a problem area for scientists to further develop vehicle independence. information is the underpinning of insight and is of extraordinary importance for further developing the vehicle independence. This paper proposes to construct the information diagram in automated battle vehicle space. The paper first and foremost purposes the philosophy to fabricate the example layer of the information diagram. In to completely communicate the vulnerability of the space information, the cosmology is probabilistically stretched out to help the portrayal of unsure information. Then form a thinking network in view of the information diagram to help the thinking of dubious information, lastly demonstrate the possibility of the information chart through a model.

ZHANG Jiaming*, LIU Zhong, SHI Junmai, and CHEN Chao (2019), Weapon configuration, allocation and route planning with time windows for multiple unmanned combat air vehicles, Automated battle air vehicles (UCAVs) mission arranging is a genuinely muddled worldwide ideal issue. Military assault missions frequently utilize an armada of UCAVs outfitted with weapons to go after a bunch of known targets. A UCAV can convey various weapons to achieve different battle missions. Decision of various weapons will contrastingly affect the last battle adequacy. This work presents a blended whole number programming model for synchronous weapon design and course arranging of UCAVs, which takes care of the issue ideally utilizing the IBM ILOG CPLEX enhancer for straightforward missions. This paper fosters a heuristic calculation to deal with the medium-scale and enormous scope issues. The tests show the presentation of the heuristic calculation in settling the medium scale and enormous scope issues. Also, we give ideas on the best way to choose the most proper calculation to tackle different scale issues.

Xuan Phong Cu, Zdenek Vintr, Miroslav Popela And Cao Vu Tran (2019) using Accelerated Reliability Testing to Predict Reliability of Electronic Components in Combat Vehicles. The sped up dependability testing (Craftsmanship) is a helpful instrument to rapidly get data about quality, dependability, practicality, and accessibility of items. Workmanship are broadly utilized in the auto and electrotechnical businesses to appraise or confirm the dependability boundaries of part and framework (for example disappointment rate, likelihood of disappointment, life time or time to disappointment), to further develop item dependability through recognition of possible deformities, to assess and think about results of various producers, and so forth. This article portrays the philosophy how to plan the Craftsmanship for electronic part in battle vehicles. The trial has been led on light discharging diodes (LEDs) 10W in the state of battle vehicles.

3. Hardware Implementation

The Raspberry Pi 4B fills in as the essential processor in this undertaking, entrusted with recognizing and distinguishing gatecrashers or people utilizing a Pi Cam 8MP. Upon location, the Pi Cam instantly communicates information to the regulator. A servo engine is then initiated to situate a laser framework, empowering exact focusing on and balance of the distinguished dangers. The GPS module assumes a vital part in deciding the gadget's area, guaranteeing functional viability and supporting the recuperation of the framework would it be a good idea for it stray out of reach or gotten derailed during front line moves.

A ultrasonic sensor supplements the identification capacities by distinguishing objects in the

ISSN: 3107 - 8605 (Online) , http://www.ijcser.com/ , Vol. 1, Issue 3, 2024, https://doi.org/10.63328/IJCSER-V1RI3P5

robot's area. This information is then handled utilizing python picture handling procedures to recognize expected dangers among the identified items, upgrading the framework's exactness and proficiency.

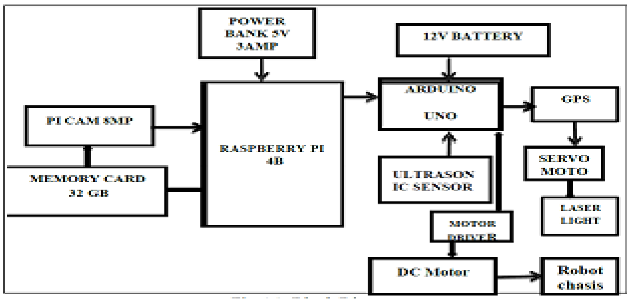


Figure. 1 Block Diagram

The ARDUINO MEGA microcontroller fills in as the focal knowledge of the framework, organizing its different parts and executing the put away projects. Power is provided to the whole framework through a 12V battery, guaranteeing continuous activity during missions. The mechanical frame integrates an engine driver and two DC engines to work with development across the combat zone territory.

Key data and notices are passed on to administrators by means of a LCD show, giving constant criticism on the framework's exercises and functional boundaries. Also, the incorporation of IoT innovation empowers remote observing and control, upgrading situational mindfulness and taking into account dynamic changes in accordance with mission targets and procedures.

Module Description:

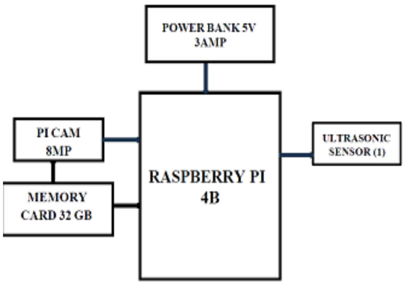


Figure. 2 Detection Model

The discovery model utilizes a Pi Cam 8MP and ultrasonic sensor to recognize gatecrashers and items in the robot's area. The Pi Cam catches pictures for danger distinguishing proof, while the ultrasonic sensor estimates distances to identify deterrents and likely dangers. These sensors cooperate to give constant information on the robot's environmental factors, empowering it to explore and answer successfully to security dangers. Upon location, the Pi Cam speedily sends information to the regulator. A ultrasonic sensor supplements the location capacities by recognizing objects in the robot's area.

Identification Model

The distinguishing proof model uses Python picture handling calculations to investigate pictures caught by the Pi Cam. These calculations are prepared to recognize explicit elements related with gatecrashers, recognizing them from different articles in the climate. By precisely recognizing dangers, the robot can focus on and answer potential security breaks with accuracy.

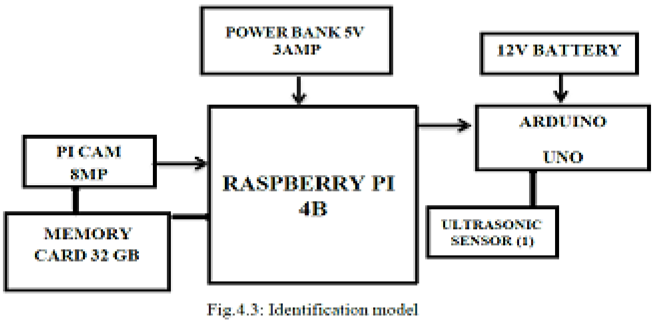


Figure. 3 Identification Model

Neutralization Model

The balance model incorporates a servo engine controlled laser framework for exact focusing of distinguished dangers. Upon location and ID of an interloper, the servo engine adjusts the laser framework to kill the danger. This framework upgrades the robot's guarded capacities, empowering it to kill security dangers in a controlled and designated way really. Key data and notices are passed on to administrators through a LCD show, giving constant input on the framework's exercises and functional boundaries. Moreover, the mix of IoT innovation empowers remote checking and control, upgrading situational mindfulness and taking into account dynamic changes in accordance with mission goals and techniques.

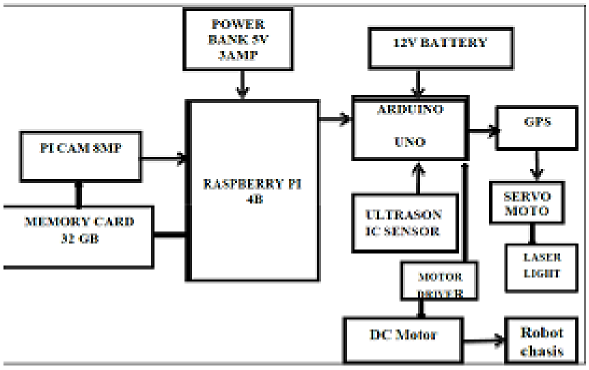


Figure. 4 Neutralization Model

4. Experimental Procedure

The Raspberry Pi 4B fills in as the essential processor in this undertaking, entrusted with distinguishing and recognizing gatecrashers or people utilizing a Pi Cam 8MP. Upon recognition, the Pi Cam instantly communicates information to the regulator. A servo engine is then enacted to situate a laser framework, empowering exact focusing on and balance of the recognized dangers. The GPS module assumes a critical part in deciding the gadget's area, guaranteeing functional viability and helping with the recuperation of the framework would it be a good idea for it stray out of reach or gotten derailed during front line makeovers.

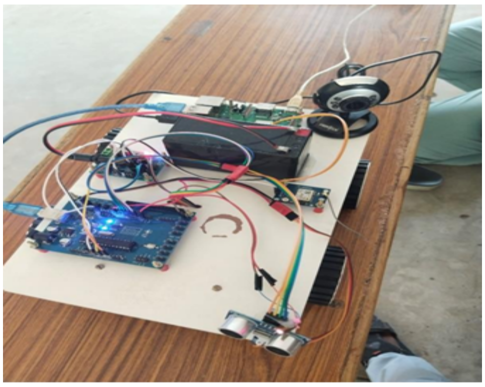
ISSN: 3107 - 8605 (Online) , http://www.ijcser.com/ , Vol. 1, Issue 3, 2024, https://doi.org/10.63328/IJCSER-V1RI3P5

A ultrasonic sensor supplements the discovery abilities by distinguishing objects in the robot's area. This information is then handled utilizing python picture handling methods to recognize likely dangers among the identified items, upgrading the framework's precision and productivity.

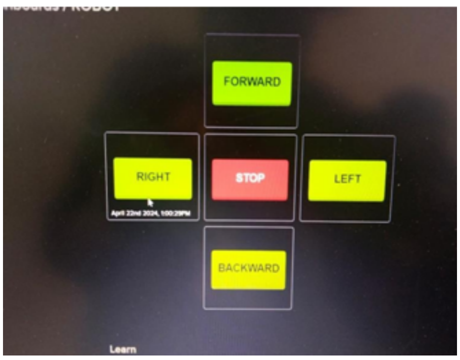
The Arduino Mega microcontroller fills in as the focal knowledge of the framework, organizing its different parts and executing the put away projects. Power is provided to the whole framework through a 12V battery, guaranteeing continuous activity during missions. The mechanical undercarriage integrates an engine driver and two DC engines to work with development across the front line landscape. Key data and notices are passed on to administrators through a LCD show, giving continuous input on the framework's exercises and functional boundaries. Also, the combination of IoT innovation empowers remote checking and control, upgrading situational mindfulness and taking into account dynamic changes in accordance with mission targets and techniques.

5. Results and Discussion

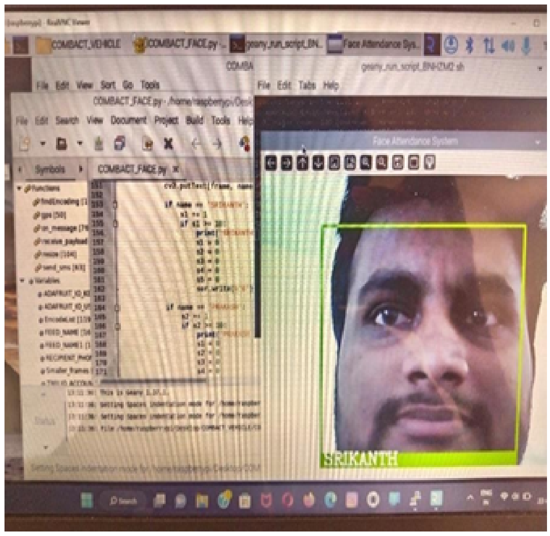
This is the result for our project. In this task we are utilizing raspberry pi and Arduino uno. By utilizing the pi cam, we use to distinguish the interloper and it process by the raspberry pi for the Arduino and yield is laser light outflow.



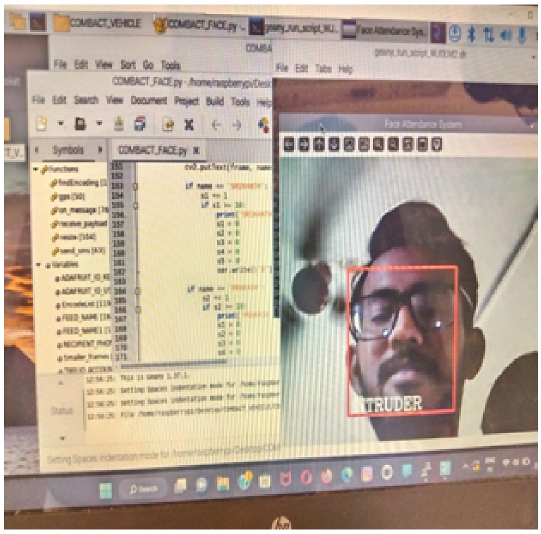
In this segment the robot will distinguish the people that are in the data set, when the individual is recognized and the individual is in the data set it won't project the laser light and moves in the forward course and it will continue to examine the entire region.



In this part the robot didn't recognize the people that are not in the data set, when the individual isn't identified it will project the laser light and the laser light will be projected on that individual.



In this, we have some control over the robot physically and we can conclude in which course the robot need to move by carefully guiding the robot either forward, left, In reverse and right.



6. Conclusion and Future Scope

In conclusion, the security robot project demonstrates the integration of advanced technologies like Raspberry Pi, Arduino, and IoT for enhanced security applications. With its capabilities in detection, identification, and neutralization, the robot offers a versatile and effective solution for various security challenges in military, industrial, border patrol, and public safety contexts.

Declaration

We Declare with our best of Knowledge that this research work is purely Original Work and No third-party material Not used in this article drafting. If any such kind material found in further online publication, we are responsible only for any judicial and copyright issues

ISSN: 3107 - 8605 (Online) , http://www.ijcser.com/ , Vol. 1, Issue 3, 2024, https://doi.org/10.63328/IJCSER-V1RI3P5

References

[1] P. Sujit, S. Saripalli, and J. B. Sousa, "Unmanned aerial vehicle path following: A survey and analysis of algorithms for fixed-wing unmanned aerial vehicles," IEEE Control Syst. Mag., vol. 34, no. 1, pp. 42–59, Feb. 2014.

[2] N. Yoshitomi, "Flight trajectory control based on required acceleration for fixed-wing aircraft," in Proc. 27th Int. Congr. Aeronautical Sci., 2010, vol. 10, pp. 1–10.

[3] L. Qian, S. Graham, and H. H.-T. Liu, "Guidance and control law design for a slung payload in autonomous landing a drone delivery case study," IEEE/ASME Trans. Mechatronics, vol. 25, no. 4, pp. 1773–1782, Aug. 2020.

[4] F. Gavilan, R. Vazquez, and E. F. Camacho, "An iterative model predictive control algorithm for UAV guidance," IEEE Trans. Aerospace. Elect. Syst., vol. 51, no. 3, pp. 2406–2419, Jul. 2015.

[5] S. Kim, H. Oh, and A. Tsardoms, "Nonlinear model predictive coordinated standoff tracking of a moving ground vehicle," AIAAJ. Guide. Control Dyn., vol. 36, no. 2, pp. 557–566, 2013.

[6] J. Yang, C. Liu, M. Coombes, Y. Yan, and W.-H. Chen, "Optimal path following for small fixed-wing UAVs under wind disturbances," IEEE Trans. Control Syst. Tech., vol. 29, no. 3, pp. 996–1008, May 2021.

[7] D. R. Nelson, D. B. Barber, T. W. McLain, and R. W. Beard, "Vector field path following for small unmanned air vehicles," in Proc. IEEE Amer. Control Conf., 2006, pp. 5788–5794.

[8] D. Cabecinhas, C. Silvestre, P. Rosa, and R. Cunha, "Path- following control for coordinated turn aircraft makeovers," in Proc. AIAA Guide., Navigate. Control Conf. Exhibit., 2007, pp. 1–19.

[9] T. Yamasaki, S. Balakrishnan, and H. Takano, "Separate- channel integrated guidance and autopilot for automatic path-

[10] R. Rydzyk, "Unmanned aerial vehicle path following for target observation in wind," AIAA J. guide. Control Dyn., vol. 29, no. 5, pp. 1092–1100, 2006.

[11] N. Cho, Y. Kim, and S. Park, "Three-dimensional nonlinear differential geometric path-following guidance law," AIAA J. guide. Control Dyn., vol. 38, no. 12, pp. 2366–2385, 2015.

[12] S. Park, J. Deyst, and J. P. How, "Performance and Lyapunov stability of a nonlinear path following guidance method," AIAA J. guide. Control Dyn., vol. 30, no. 6, pp. 1718–1728, 2007.

[13] L. Meier, P. Tanskanen, L. Heng, G. H. Lee, F. Fraunhofer, and

[14] M. Pollefeys, "PIXHAWK: A micro aerial vehicle design for autonomous flight using onboard computer vision," Auton. Robot., vol. 33, no. 1/2, pp. 21–39, 2012.

[15] R. Curry, M. Lizarraga, B. Mairs, and G. H. Elkaim, "L2, an improved line offsite guidance law for UAVs," in Proc. IEEE Amer. Control Conf., 2013, pp. 1–6.

[16] T. Stastny, "L1 guidance logic extension for small UAVs: Handling high winds and small loiter radii," CoRR, vol. abs/1804.0, 2018.

[17] P. Eng, L. Mejias, X. Liu, and R. Walker, "Automating human thought processes for a UAV forced landing," J. Intel. Robot. Syst., vol. 57, no. 1–4, pp. 329–349, 2010.

[18] P. Eng, "Path planning, guidance and control for a UAV forced landing," Ph.D. dissertation, School of Engineering Systems, Queensland Univ. Technol., Brisbane, QLD, Australia, 2011