Physical Fitness Detector for Selection in Defense Departments

Ms. Sherley Suzane Tremot[1], Ms. Nivetha B.[2], Ms. Kavitha M.[3], Mrs. Vithiya R.[4]
[1,2,3]*UG Student, Manakula Vinayagar Institute of Technology, Puducherry*
[4]*Assistant Professor, Manakula Vinayagar Institute of Technology, Puducherry*

Abstract—**Physical fitness plays a crucial role in defense-based job selection, where candidates are required to meet specific health and fitness standards. Traditional physical fitness evaluation methods are often time-consuming, manual, and prone to human error, especially during large-scale recruitment processes. This project, titled "Physical Fitness Detector for Selection in Defense Departments," aims to automate the preliminary screening process by accurately measuring the basic physical parameters of candidates. The proposed system measures a candidate's height using an ultrasonic sensor and weight using a load cell interfaced with an HX711 module. Based on these measurements, the system automatically calculates the Body Mass Index (BMI), which is used as a key indicator to assess the physical fitness level of the candidate. The calculated BMI is then compared with predefined defense recruitment standards, and the candidate's eligibility status is displayed as "Selected" or "Rejected." "This automated approach minimizes human intervention, reduces evaluation time, and improves accuracy and fairness in the selection process. The system can be effectively deployed in defense recruitment camps and physical fitness examination centers, thereby enhancing operational efficiency and ensuring uniform assessment of candidates' physical fitness.**

Index Terms—**Physical Fitness Detection, Body Mass Index (BMI), Arduino UNO ATmega328P, Ultrasonic Sensor, Load Cell, HX711 Module, Defense Recruitment System, Automated Fitness Evaluation, Embedded System, Sensor-Based Measurement System.**

I. INTRODUCTION

Physical fitness is a fundamental requirement for individuals aspiring to join defense services such as the Army, Navy, Air Force, and other paramilitary forces. Defense personnel are expected to maintain high levels of physical endurance, strength, and overall health to efficiently perform demanding duties under challenging environmental and operational conditions. As a result, physical fitness assessment forms a critical component of the recruitment and selection process in defense departments. Traditionally, physical fitness evaluation during defense recruitment is carried out manually using measuring tapes for height, mechanical weighing scales for weight, and manual calculation methods to determine fitness eligibility. While these methods have been in use for many years, they are often time-consuming, prone to human error, and difficult to manage during large-scale recruitment drives involving a high number of candidates. Inconsistent measurement techniques and subjective judgment may also affect the fairness and accuracy of the selection process.

With advancements in embedded systems and sensor technologies, there is a growing scope for automating physical fitness assessment processes. Automation not only improves accuracy but also ensures uniformity and transparency in evaluation. Microcontroller-based systems, combined with sensors and digital processing, provide reliable and repeatable measurements, making them suitable for large-scale applications. The project titled "Physical Fitness Detector for Selection in Defense Departments" is designed to address these challenges by developing an automated system capable of measuring essential physical parameters such as height and weight. Using these parameters, the system computes the Body Mass Index (BMI), which serves as a standard indicator of physical fitness. Based on predefined defense recruitment standards, the system determines whether a candidate meets the required fitness criteria.

The proposed system reduces human intervention, minimizes errors, and speeds up the screening process. It can be effectively implemented in defense recruitment camps, training centres, and preliminary medical examination units. By ensuring accurate, fast, and unbiased assessment, the system contributes to improving the efficiency and reliability of defense personnel selection.

II. LITERATURE REVIEW

2.1 Physical fitness evaluation has been a critical component of human performance assessment in occupations that demand strength, endurance, agility, and sustained physical effort. Defense recruitment is one such domain where physical fitness directly influences operational efficiency, mission success, and personnel safety. Over the years, fitness assessment techniques have evolved from subjective visual inspection to standardized anthropometric measurements. Among these, height, weight, and derived indices such as Body Mass Index (BMI) have gained prominence due to their simplicity and reliability.

Manual assessment methods, although widely practiced, are vulnerable to several challenges including measurement inconsistencies, evaluator fatigue, procedural variation, and potential bias. These limitations become more evident during large-scale recruitment campaigns, where uniformity and transparency are difficult to maintain. As a result, research interest has increasingly shifted toward automated and technology-assisted fitness evaluation systems that ensure objective, repeatable, and unbiased measurements.

2.2 Body Mass Index (BMI) is one of the most extensively used anthropometric indices for assessing physical fitness and health status. It is calculated using an individual's height and weight, making it a practical and economical tool for large-scale screening. Kolimechkov and Petrov conducted a systematic review and emphasized BMI's continued relevance as a standardized indicator for evaluating weight-related health risks and general physical fitness across populations [1]. Their review concluded that despite advancements in body composition analysis, BMI remains indispensable for preliminary fitness assessment due to its simplicity and comparability. The conceptual foundation of BMI was firmly established by Keys et al., who analyzed various indices of relative weight and demonstrated that BMI shows the strongest correlation with body fat percentage at the population level [2]. Their findings validated BMI as a statistically robust indicator and supported its adoption in epidemiological studies and occupational health screening. This work significantly influenced international health organizations and laid the groundwork for BMI-based fitness standards.

The World Health Organization (WHO) further formalized BMI's role through its technical reports. In Obesity: Preventing and Managing the Global Epidemic, WHO defined internationally accepted BMI cutoff values that categorize individuals into underweight, normal weight, overweight, and obese groups [3]. These classifications are now universally used in health monitoring and occupational fitness evaluations. Another WHO report, Physical Status: The Use and Interpretation of Anthropometry, highlighted standardized methods for height and weight measurement, emphasizing their importance in ensuring accurate BMI computation [4].

Researchers have also focused on extending BMI reference standards to different age groups and populations. Cole et al. proposed internationally consistent BMI cutoff points for children and adolescents, facilitating cross-country comparisons of obesity prevalence [5]. Kuczmarski et al. developed the CDC 2000 growth charts, which provide detailed percentile-based BMI interpretations for the U.S. population [6]. De Onis et al. further refined WHO growth references for school-aged children and adolescents, enhancing global applicability and accuracy [7]. These studies collectively strengthen the scientific foundation of BMI as a universal screening tool.

2.3 Despite its widespread acceptance, BMI has been critically examined for its limitations. Garn et al. identified key shortcomings, noting that BMI does not differentiate between fat mass and lean muscle mass and does not account for fat distribution [8]. This can result in misclassification, particularly among individuals with high muscular development, such as athletes or defense trainees. These limitations have led to ongoing debates regarding BMI's applicability in physically active populations.

Nihiser et al. examined BMI measurement practices in institutional settings and highlighted issues related to measurement accuracy, observer variability, and procedural inconsistency [9]. Their findings indicated that errors in height and weight measurement directly affect BMI reliability. This reinforces the importance of precise and standardized measurement techniques, especially in high-stakes environments like defense recruitment.

Comparative studies have further explored differences among BMI classification systems. Li et al. compared CDC, WHO, and IOTF BMI references and observed that although overall trends are similar, classification outcomes can vary due to population-specific calibration [10]. Nevertheless, the study reaffirmed BMI's utility as a screening tool when uniform standards and accurate measurement methods are employed. Large-scale empirical studies have also investigated the relationship between BMI and physical fitness performance. Research involving extensive student populations has revealed a non-linear association between BMI and physical fitness index (PFI), often exhibiting an inverted-U or inverted-J pattern. These findings indicate that individuals within the normal BMI range tend to achieve higher fitness scores, while both underweight and overweight individuals show reduced physical performance.

2.4 Numerous population-based studies have examined the direct relationship between BMI and physical fitness outcomes. Cross-sectional studies involving thousands of participants have demonstrated statistically significant correlations between BMI and performance in endurance, strength, speed, and flexibility tests. Individuals with normal BMI values generally exhibit superior physical fitness levels compared to those outside this range. A large-scale analysis involving more than one million college students reported a clear inverted-J-shaped relationship between BMI and physical fitness index. Fitness levels improved as BMI increased from underweight to normal ranges, reached a peak within the normal BMI category, and declined as BMI entered overweight and obese ranges. These findings provide strong empirical support for the use of BMI as a preliminary fitness indicator in mass screening applications.

Such correlations are particularly relevant to defense recruitment, where physical readiness is essential for operational effectiveness. Although BMI alone cannot capture all dimensions of physical fitness, its strong association with overall performance justifies its role as an initial screening criterion before more detailed physical tests are conducted.

2.5 Advancements in embedded systems and sensor technology have significantly transformed physical fitness assessment methodologies. Automated systems integrating sensors with microcontrollers enable accurate, repeatable, and real-time measurement of physical parameters. These systems reduce human involvement, thereby minimizing measurement errors and subjective bias. Recent research has demonstrated the feasibility of intelligent health monitoring systems using sensor-based data acquisition. An IEEE conference paper presented at the International Conference on Computing, Communication and Networking Technologies (ICCCNT 2021) proposed an automated health monitoring framework utilizing sensors and microcontroller-based processing (DOI: 10.1109/ICCCNT51525.2021.9579637). The study highlighted improved accuracy, consistency, and reliability compared to manual methods, reinforcing the value of automation in physical assessment systems.

Other studies have explored the integration of machine learning techniques with physical fitness data to enhance predictive accuracy. Hybrid deep learning models combining neural networks and ensemble classifiers have demonstrated improved BMI category prediction and fitness assessment based on multi-parameter datasets. While these approaches offer advanced analytical capabilities, they often require complex infrastructure and high computational resources, limiting their practicality in field-based recruitment environments. In contrast, sensor-based BMI assessment systems offer a balanced solution by combining simplicity, affordability, and operational efficiency. The use of ultrasonic sensors for height measurement and load cells for weight measurement enables accurate data acquisition suitable for high-volume screening applications such as defense recruitment.

2.6 The reviewed literature highlights extensive research on BMI standards, classification systems, and population-level fitness correlations. However, there is limited focus on practical, low-cost, and portable automated BMI assessment systems specifically designed for defense recruitment environments. Most existing systems are either clinical-grade, complex, or aimed at general health monitoring rather than recruitment-based decision-making. There is a clear research gap in the development of dedicated systems that integrate automated height and weight measurement with real-time BMI computation and objective candidate classification based on predefined defense standards. Addressing this gap is essential to ensure fairness, transparency, and efficiency in large-scale recruitment processes.

The proposed Physical Fitness Detector system directly addresses this need by combining sensor-based measurement, microcontroller-driven computation, and automated decision logic. By eliminating manual intervention and subjective judgment, the system ensures unbiased evaluation while maintaining simplicity and cost-effectiveness. The reviewed literature strongly supports the relevance and necessity of such an automated approach for defense recruitment applications.

III. EQUATION

The equation to calculate the Body Mass Index is,

$$\mathrm{BMI} = \frac{\text{Weight (Kg)}}{\text{Height } (\mathrm{m}^2)}$$

IV. UNITS

The unit of weight – Kg – Kilogram
The unit of height – cm – Centimeter
The unit of height – m – Meter
The unit of BMI – Kg/m^2 – Kilogram per Meter square
m^2 – Meter square

V. BLOCK DIAGRAM OF THE SYSTEM & ITS EXPLANATION

The block diagram of the proposed Physical Fitness Detector System represents the overall functional structure of the system and illustrates the interaction between the different modules involved in the physical fitness evaluation process. The diagram provides a conceptual representation of how the system components are interconnected and how the information flows from the sensing stage to the final result indication stage. The system is organized into four major functional blocks namely Process, Error Detector, Controller, and Output Element, which together perform measurement, analysis, and result display. The Process block represents the stage where the physical parameters of the candidate are obtained. In this project, the process involves measuring the height and weight of the candidate, which are the primary parameters required for evaluating the physical fitness condition. These measured parameters serve as the input data for the system and are further used for analysis and decision-making.

The measured values obtained from the process stage are forwarded to the Error Detector block. The purpose of this block is to compare the measured parameters with the predefined physical fitness standards. The system evaluates whether the obtained values satisfy the required criteria. Any deviation between the measured parameters and the predefined limits is detected at this stage. This comparison mechanism helps the system determine whether the candidate meets the necessary conditions for physical fitness eligibility. The Controller block performs the main processing and decision-making function of the system. In the proposed system, the controller used is the Arduino UNO board based on the ATmega328P microcontroller. The controller receives the input data from the sensing stage and processes it according to the programmed logic. It performs the required calculations, analyzes the measured parameters, and determines whether the candidate satisfies the predefined physical fitness requirements. The controller also generates appropriate control signals to operate the output devices and manage the overall functioning of the system. The processed result is then transmitted to the Output Element block through the control signals generated by the controller. The output element is responsible for presenting the result of the fitness evaluation to the user. In this system, an I2C interfaced LCD display and LED indicators are used for result indication. The LCD display shows the relevant information and the final decision of the system, while the LEDs provide a clear visual indication of whether the candidate is "Selected" or "Rejected."

Additionally, a buzzer unit is included in the system to provide an audible indication once the measurement process is completed. The buzzer does not indicate the selection result; instead, it signals that the measurement procedure has finished successfully and informs the candidate that they can step down from the sensing plate. After the completion of one measurement cycle, the system enters a short idle time period before the next operation begins. During this time, the system prepares itself for the next candidate and ensures that the measurements are performed independently without interference from previous readings.

Thus, the block diagram clearly represents the logical flow of the automated physical fitness detector system, showing how the input parameters are measured, processed by the controller, and finally displayed to provide the fitness evaluation result.

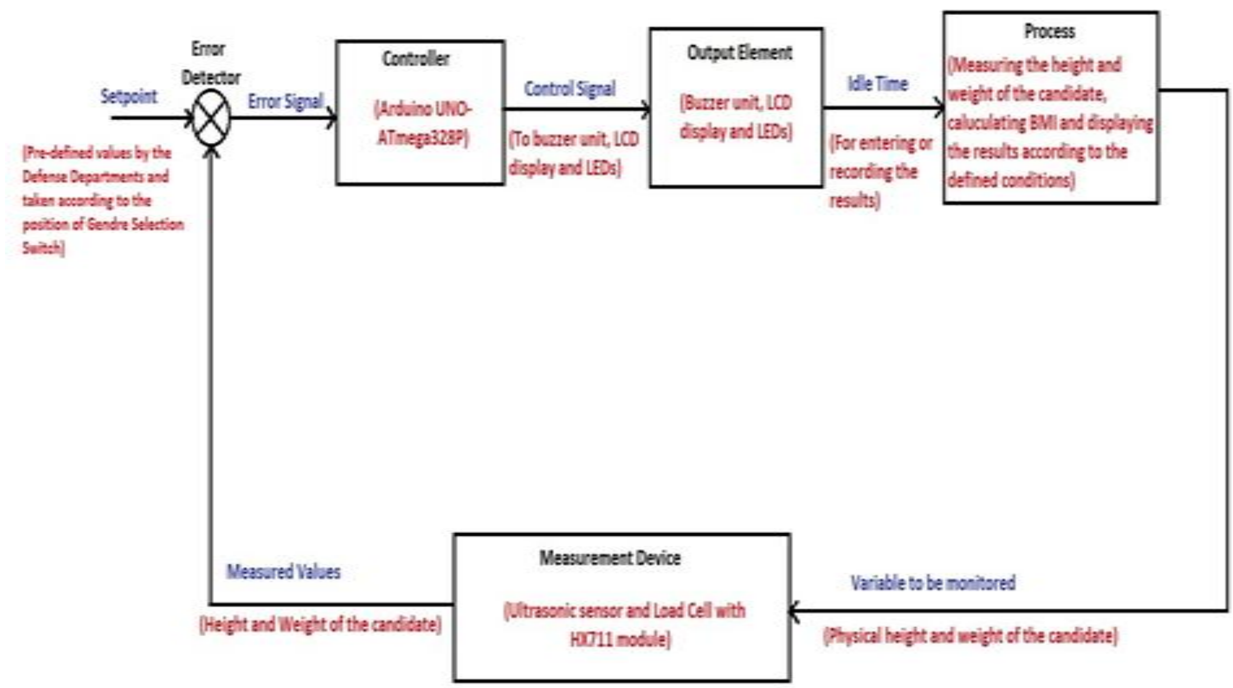

Fig 1: Block diagram of the System

VI. CONNECTION DIAGRAM, CONSTRUCTION AND WORKING OF THE SYSTEM

This section describes the electrical connections, physical construction, and operational working of the proposed Physical Fitness Detector System. The system is designed to automatically measure the height and weight of a candidate, compute the Body Mass Index (BMI), and determine whether the candidate meets the required physical fitness criteria. The entire system integrates sensing devices, a processing unit, and output indicators to perform automatic evaluation with minimal human intervention. The major components used in the system include the Arduino UNO (ATmega328P) microcontroller, ultrasonic sensor, load cell module for weight sensing, I2C interfaced LCD display, LED indicators, buzzer unit, resistors, jumper wires, and a 9 V DC power supply. The connection diagram illustrates the electrical interconnections between these components, while the construction explains how the hardware is physically assembled to form the complete system.

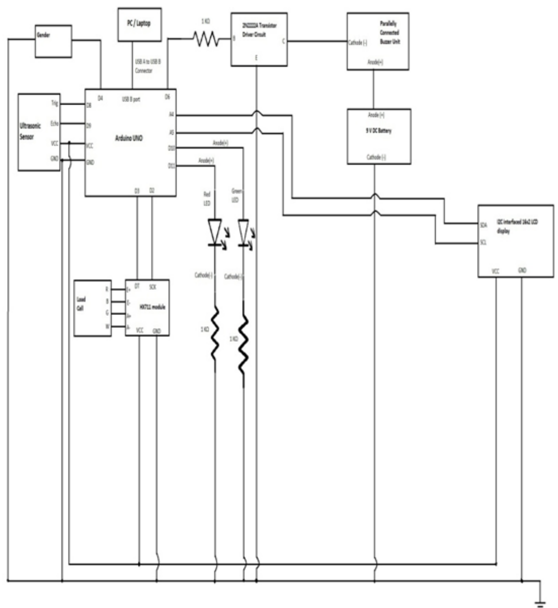

Fig 2: Connection Diagram of the System

6.1 Explanation of Connection Diagram

The connection diagram provides a clear representation of how all the hardware components are electrically connected to the Arduino UNO board based on the ATmega328P microcontroller, which acts as the central control unit of the system. The Arduino collects sensor data, performs the necessary calculations, and controls the output devices. The ultrasonic sensor used for height measurement is connected to the Arduino UNO through digital pins. The Echo pin of the ultrasonic sensor is connected to digital pin D9 of the Arduino UNO, allowing the microcontroller to receive the reflected ultrasonic signal used for distance calculation. The VCC pin of the ultrasonic sensor is connected to the 5 V supply of the Arduino board, while the GND pin is connected to the common ground of the circuit. These connections enable the sensor to operate properly and communicate the distance information to the microcontroller. The LED indicators are connected to the Arduino UNO to provide visual indication of the evaluation result. The anode terminal of one LED is connected to digital pin D10, while the anode of the second LED is connected to digital pin D11 of the Arduino UNO. Each LED is connected in series with a 1 kΩ resistor to limit the current and protect the LED from excessive current flow. The cathodes of both LEDs are connected to the ground of the system. These LEDs glow according to the decision made by the microcontroller, indicating whether the candidate is selected or rejected. The I2C interfaced LCD display is connected to the Arduino UNO through the I2C communication interface. The SDA (Serial Data) pin of the LCD module is connected to analog pin A4, and the SCL (Serial Clock) pin is connected to analog pin A5 of the Arduino UNO. The LCD module also receives power through the VCC and GND pins, which are connected to the 5 V and ground terminals of the Arduino board respectively. This communication interface allows the Arduino to display measured values and system messages on the LCD screen using only two communication lines.

The buzzer unit is connected to the system to provide an audible signal when the measurement process is completed. The buzzer is powered through a 9 V DC battery supply, where the anode (+) terminal of the battery is connected to the anode terminal of the buzzer, and the cathode (–) terminal of the battery is connected to the common ground of the system. The buzzer operates as an alert mechanism to notify the candidate when the measurement process is successfully completed. All the components share a common ground connection, which ensures stable operation of the circuit. The electrical connections are made using jumper wires, and the circuit can initially be assembled on a breadboard during the prototype stage before being mounted permanently in the final system setup.

6.2 Construction of the System

The physical construction of the proposed system involves assembling the hardware components in a suitable arrangement so that accurate measurement of height and weight can be achieved. A stable sensing platform is constructed to measure the body weight of the candidate. The load cell sensor is mounted beneath the platform so that it can detect the force applied when a person stands on the plate. The platform is designed to distribute the weight evenly over the load cell, ensuring reliable and accurate measurement. Proper mechanical mounting of the load cell is essential to avoid measurement errors due to uneven force distribution.

A vertical support frame is constructed above the sensing platform to hold the ultrasonic sensor at a fixed position. The sensor is mounted at a known height above the platform so that it can measure the distance between the sensor and the candidate's head. This mounting arrangement allows the system to determine the candidate's height accurately by comparing the measured distance with the fixed mounting height of the sensor. The Arduino UNO board is placed inside a protective enclosure to safeguard the electronic components from external disturbances such as dust or accidental contact. The I2C LCD display is mounted on the front panel of the system enclosure so that the user can easily view the measurement results. The LED indicators are also positioned on the front panel to provide a clear visual indication of the candidate's selection status.

The buzzer unit is mounted within the enclosure so that it can generate an audible signal when the measurement process is completed. All the electrical connections between components are made using insulated wires or jumper wires, and the entire system is powered using a 9 V DC battery supply. This construction arrangement ensures that the sensors are positioned correctly for accurate measurements while allowing the display and indicators to be easily visible to the user.

6.3 Working of the System

The working of the proposed Physical Fitness Detector System begins when a candidate steps onto the sensing platform. Once the candidate stands on the platform, the sensors begin measuring the required physical parameters. The ultrasonic sensor measures the distance between the sensor and the candidate's head by transmitting ultrasonic waves and receiving the reflected echo signal. Based on the time taken for the echo to return, the system calculates the distance. Since the ultrasonic sensor is mounted at a known height above the platform, the system determines the candidate's actual height by subtracting the measured distance from the fixed mounting height. Simultaneously, the load cell sensor measures the body weight of the candidate. When the candidate stands on the sensing platform, the applied force causes a small deformation in the load cell, which generates a corresponding electrical signal. This signal is converted into a digital value that represents the weight of the candidate.

Both the height and weight values are transmitted to the Arduino UNO (ATmega328P) microcontroller, which processes the sensor data. The microcontroller then calculates the Body Mass Index (BMI) using the formula:

$$\mathrm{BMI} = \frac{\text{Weight (Kg)}}{\text{Height } (\mathrm{m}^2)}$$

The calculated BMI value is compared with predefined BMI limits used to determine whether the candidate satisfies the required physical fitness conditions. After completing the analysis, the Arduino sends the results to the I2C LCD display, where the measured height, weight, and BMI values are displayed. Along with these parameters, the LCD also displays the final status of the candidate as "Selected" or "Rejected."

The LED indicators provide a visual representation of the decision made by the system. If the candidate meets the required fitness criteria, the selection LED glows, indicating that the candidate is eligible. If the BMI value falls outside the acceptable range, the rejection LED glows, indicating that the candidate does not satisfy the required criteria. Once the measurement and evaluation process is completed successfully, the buzzer unit produces a short audible signal. This sound indicates that the measurement process has finished and informs the candidate that they can step down from the sensing platform.

After the candidate leaves the platform, the system automatically resets and enters an idle state. This reset ensures that the sensors are ready for the next measurement cycle and that the readings of the previous candidate do not affect the next measurement. Through this automated sensing, processing, and result indication process, the proposed system provides an efficient and reliable method for physical fitness evaluation, reducing manual effort and minimizing measurement errors.

VII. ALGORITHM OF THE SYSTEM

The algorithm of the proposed Physical Fitness Detector System is described as follows:

1. Start the system.
2. Initialize Arduino UNO, ultrasonic sensor, load cell with HX711 module, LCD display, LEDs, buzzer, and gender selection switch.
3. Display “Fitness Detector for Defense”.
4. Display “Waiting”
5. Check the presence of the candidate.
6. If the candidate is not detected, remain in the waiting state.
7. If the candidate is detected, read the gender input.
8. Display the selected gender.
9. Display “Measuring”.
10. Measure height using the ultrasonic sensor.
11. Measure weight using the load cell and HX711 module.
12. Calculate BMI.
13. Turn ON the buzzer to indicate completion of measurement.
14. Display height, weight, and BMI.
15. Check whether the height meets the required criteria.
16. Check whether BMI is within the acceptable range.
17. If both conditions are satisfied, display “SELECTED” and turn ON the green LED.
18. Otherwise, display “REJECTED” and turn ON the red LED.
19. Display “Fitness Detector for Defense” for 30 seconds.
20. Return to waiting state for the next candidate.
21. Stop the process when the system is turned OFF.

VIII. FLOW CHART OF THE SYSTEM

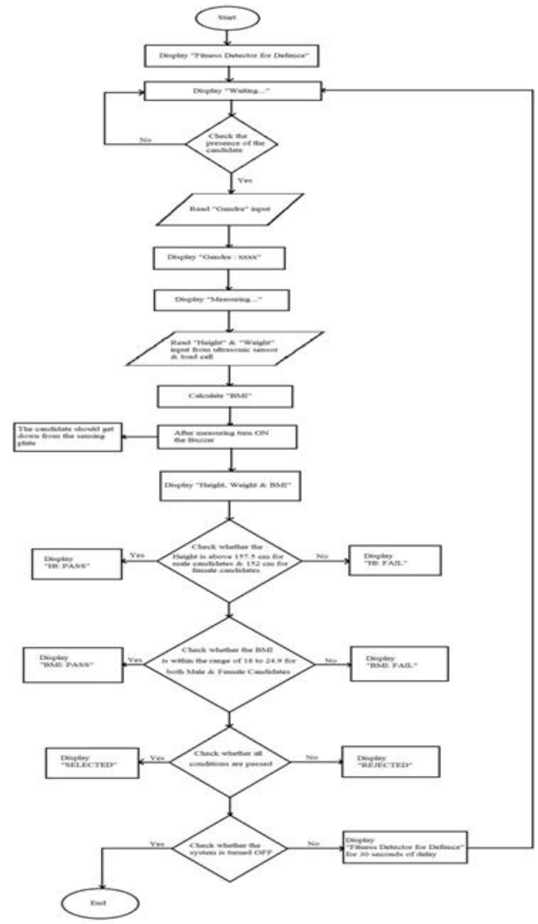

Fig 3: Flow chart of the system

IX. OUTPUT AND DISCUSSION

A. Output

The output of the proposed Physical Fitness Detector System can be observed through multiple output interfaces used in the system. The primary output is displayed on the 16×2 I2C interfaced LCD display, where the measured parameters and the final evaluation result are shown. The LCD display presents information such as the measured height, weight, calculated BMI, and the final selection status of the candidate. In addition to the LCD display, the system uses LED indicators to provide a clear visual indication of the candidate’s eligibility. A green LED is turned ON when the candidate satisfies the required physical fitness criteria and is declared “SELECTED”. A red LED is turned ON when the candidate does not meet the required standards and is declared “REJECTED”.

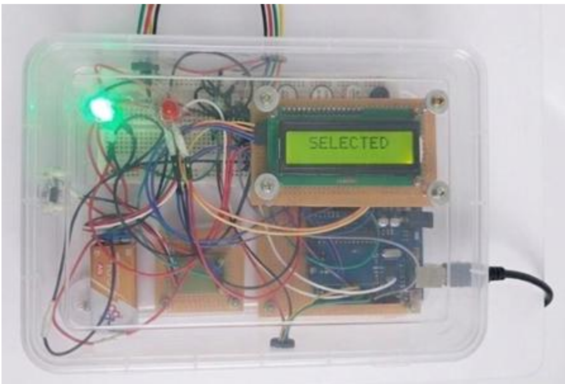

Fig 4: Output when a candidate is Selected

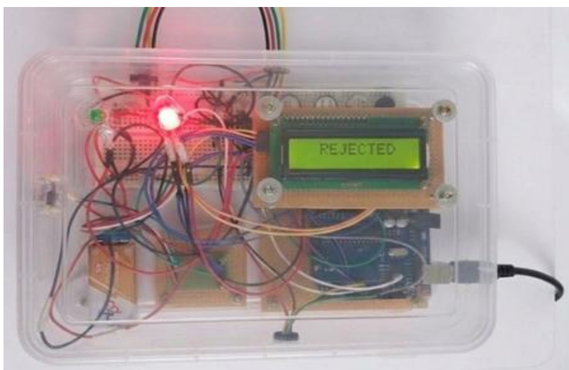

Fig 5: Output when a candidate is Rejected

The output of the system can also be monitored through a laptop or PC using the Serial Monitor of the Arduino IDE. The Arduino UNO transmits the measured values and evaluation results as serial data, allowing the operator to observe the measurements and system status in real time through the connected computer.

Fig 6: Output in the Serial Monitor while examining a candidate

B. Discussion

The developed system successfully measures the height and weight of a candidate and calculates the Body Mass Index (BMI) automatically. The system processes the measured data using the Arduino UNO (ATmega328P) microcontroller and determines whether the candidate satisfies the required physical fitness standards.

The results are clearly displayed through the LCD display and LED indicators, making the system easy to understand and operate. The use of automated measurement and decision-making helps reduce human errors and favoritism, ensuring a fair and transparent evaluation process. Overall, the system provides a simple, reliable, and efficient solution for preliminary physical fitness assessment in defense recruitment environments.

X. SIMULATION

The proposed system was rigorously validated using the Wokwi Online Simulator. Comprehensive simulations were conducted across all defined test cases for both male and female subjects. For illustrative purposes, figure [7,8,9,10,11,12,13,14] provides a representative simulation capture demonstrating the system’s successful execution for a female candidate.

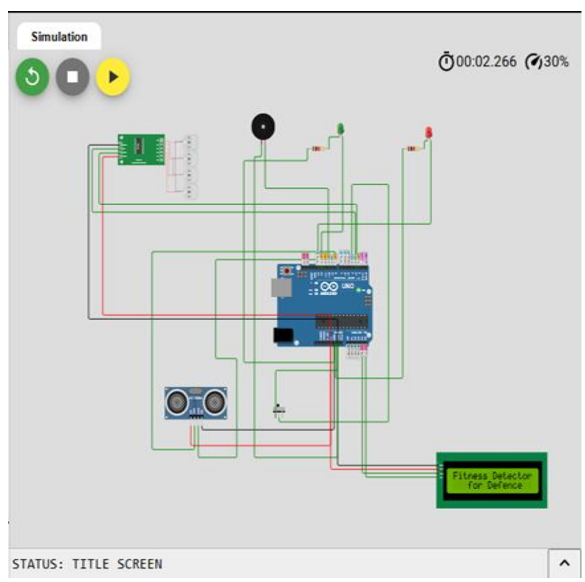

Fig 7: Displaying the title of the system

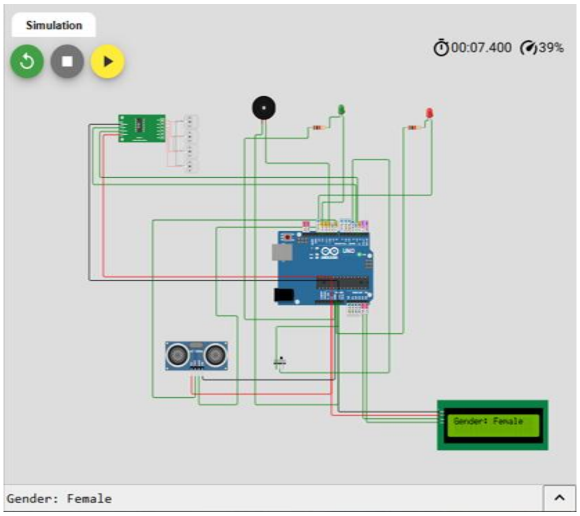

Fig 8: Displaying the Gender of the candidate

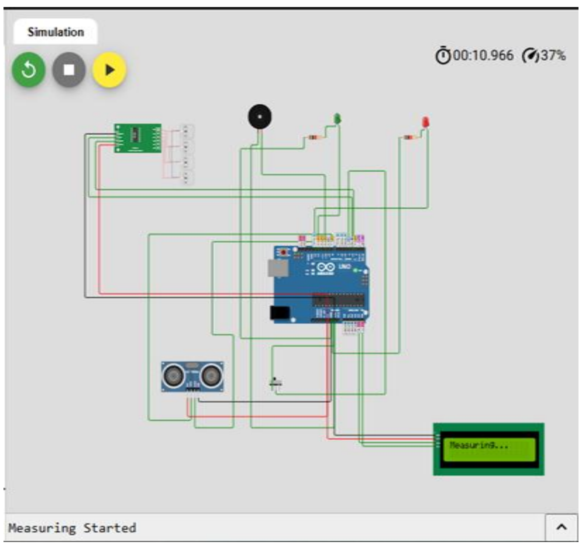

Fig 9: Displaying “Measuring” Status

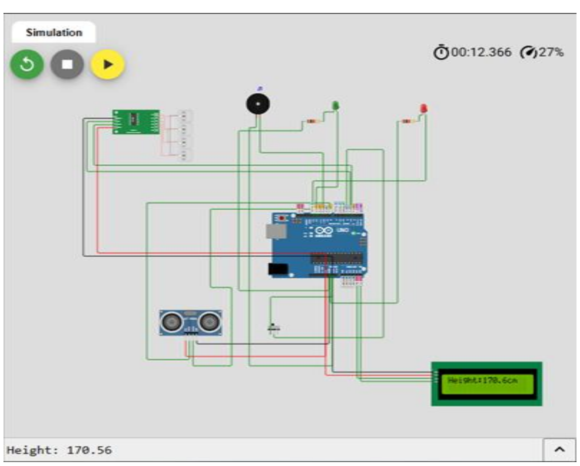

Fig 10: Displaying the Height of the candidate

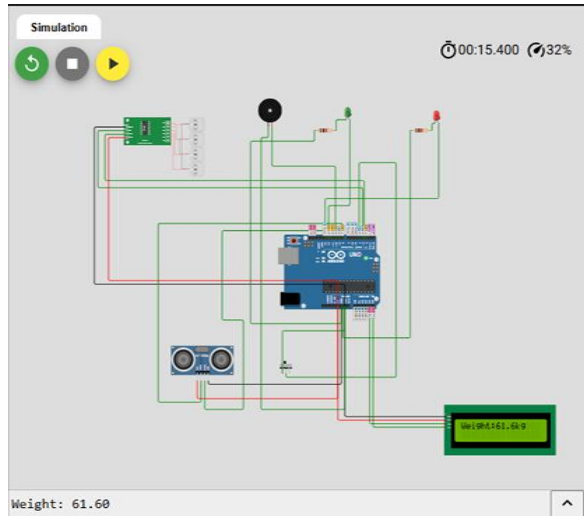

Fig 11: Displaying the Weight of the candidate

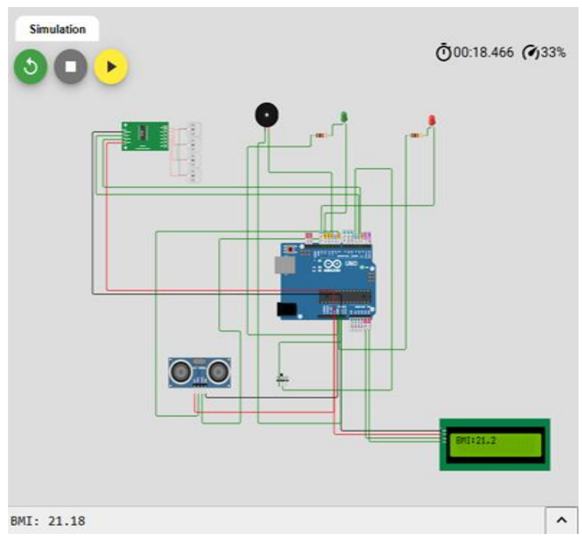

Fig 12: Displaying the BMI of the candidate

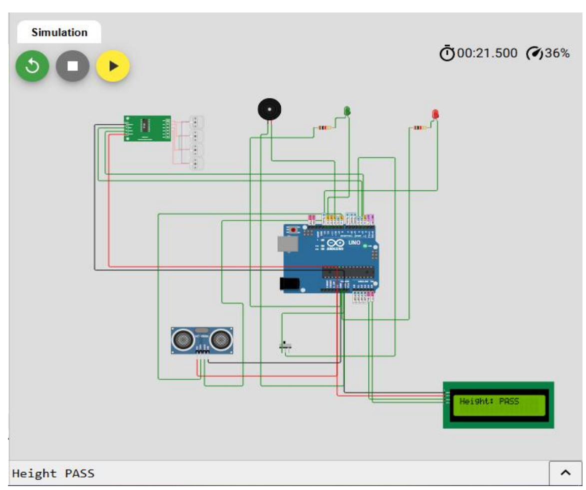

Fig 13: Displaying the result of Height

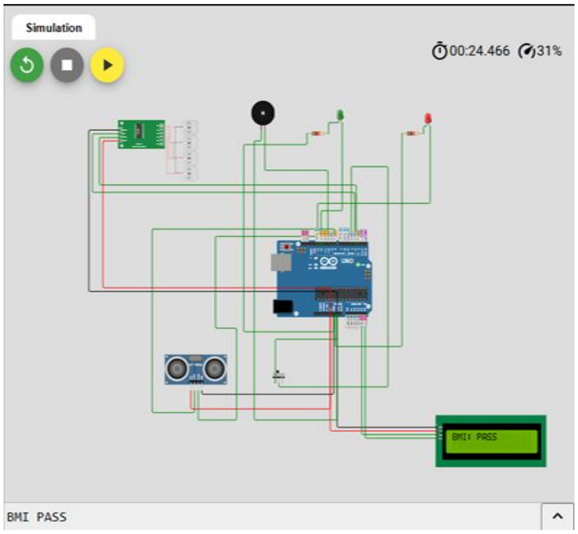

Fig 14: Displaying the result of BMI

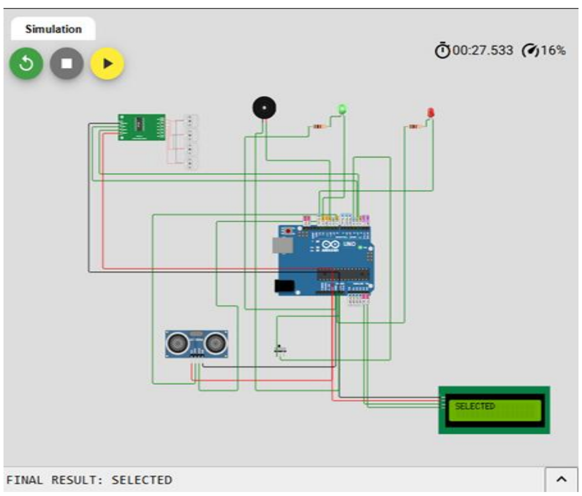

Fig 15: Displaying the final result of the candidate

XI. CONCLUSION

The proposed Physical Fitness Detector System was successfully designed and implemented to automatically measure and evaluate the physical fitness parameters required for defense recruitment. The system integrates sensing devices, a microcontroller, and output indicators to perform the measurement and evaluation process efficiently. By using sensors to measure height and weight, the system calculates the Body Mass Index (BMI) and determines whether a candidate satisfies the predefined physical fitness criteria. The Arduino UNO (ATmega328P) microcontroller acts as the central processing unit that collects data from the ultrasonic sensor and load cell through the HX711 module, processes the measurements, and performs the required calculations. The calculated parameters and evaluation results are displayed on the 16×2 LCD display, while the LED indicators provide a clear visual indication of whether the candidate is selected or rejected. In addition, the buzzer unit alerts the candidate once the measurement process is completed.

The developed system helps simplify the initial physical screening process by automating the measurement and evaluation procedures. This reduces manual effort and minimizes the possibility of human errors during the assessment. The use of easily available electronic components makes the system cost-effective, reliable, and suitable for practical implementation in environments where large numbers of candidates need to be evaluated. The results obtained from the implementation and simulation confirms that the system can accurately measure the required parameters and provide quick evaluation results. Therefore, the proposed Physical Fitness Detector System can serve as a useful tool for preliminary physical fitness assessment in defense recruitment processes, improving efficiency, transparency, and consistency in the evaluation procedure.

Prototype of the System

Fig 15: Prototype of the system

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