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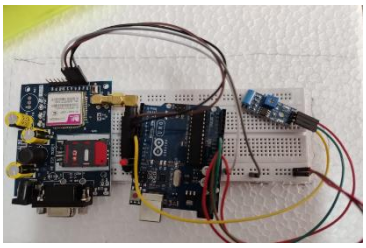
Office of the Principal
SHAHID MATANGINI HAZRA GOVT. GENERAL DEGREE COLLEGE FOR WOMEN
Chaksrikrishnapur-Kulberia :: Kulberia :: Purba Medinipur 721649
matanginicollege@gmail.com/ principal@matanginicollege.ac.in 03228-262261/262262 www.matanginicollege.ac.in



Project Report: Development of a Women Safety Device "Arishta"

Department of Physics,

Shahid Matangini Hazra Govt. General Degree College for Women

➢ Introduction

The increasing concerns regarding women's safety have prompted the development of various technological solutions aimed at providing immediate assistance in times of distress. The Department of Physics of Shahid Matangini Hazra Govt. General Degree College for Women, dedicated to fostering scientific innovation, embarked on a project to develop a women safety device. The device is designed to be user-friendly, easily accessible, and effective in ensuring the safety of women, particularly in emergency situations. This report details the conception, development, testing, and potential impact of the project.

➢ Project Objectives

The primary objective of the project was to design and build a portable safety device that could be easily used by women in critical situations. The specific goals included:

- Creating a compact, wearable device that can send alerts to pre-identified contacts.
- Ensuring the device is equipped with GPS functionality for location tracking.
- Integrating a simple activation mechanism that can be triggered quickly in emergencies. • Testing the device in real-world scenarios to ensure reliability and effectiveness.

➢ Project Team

The project was undertaken by the group of 2nd year students from the Department of Physics under the supervision of Mr. Sayan Bag, Assistant Professor of this department, The team was composed of:

- **Pinki Maji, Team Leader, Circuit Design and Prototyping**
- **Sayan Bag, Software Development and GPS Integration**
- **Mitali Bera & Sayan Bag User Interface and Activation Mechanism Design**
- **Anjushree Jana, Testing and Data Analysis**

➢ Methodology

The development of the women safety device was carried out in several stages:

Conceptualization and Design

The initial phase involved brainstorming sessions to identify the key features and functionalities required for the device. The team decided on a compact, wearable device that could be discreetly worn as a pendant or bracelet or can be carried within small money bag. The design included:

- An Arduino - Uno board
- A GSM module to send alert message and call to predefined numbers in the programme • A panic button for immediate activation.
- A activation accelerometer module for the activation of the device by a shake
- A battery for the power supply

Circuit Design and Prototyping

The circuit design was created using simulation software, and the components were selected based on size, power efficiency, and reliability. The prototype has been developed on a bread board, with the necessary components soldered onto a Arduino board once the design was finalized. o **Software Development**

The software for the device was developed using C++ language in a dedicated interface of Arduino Uno software. The program was responsible for sending SMS alerts containing the GPS location to emergency contacts when the panic button will be pressed or when the vibration of certain amplitude will be given. o **Integration and Testing**

The device was assembled, and the hardware components were integrated with the software. Extensive testing was conducted to ensure the device worked under various conditions, such as low battery, weak GPS signal, and in different environmental settings.

- **User Feedback and Iteration**

To assess the usability of the device, a group of female students and staff from the college volunteered to test it. Their feedback was collected and used to make necessary adjustments, such as improving the ease of activation and enhancing the battery life and to ease in portability and compactness of the device.

- **Results**

The final prototype of the device met the initial objectives and was successfully tested in multiple scenarios. The key features of the device included:

Compact Design: The device was lightweight and can be carried within a small bag.

Effective Communication: The GSM module reliably sent out emergency messages and calls to the preprogrammed contacts,

Ease of Use: The panic button was easy to activate, even under stress, but the inclusion of the shake detection module was very useful specially under those circumstances when the button will either not work or cannot be pressed. The two way activation system has been used ensuring that users could quickly signal for help.

➢ Discussion

The development of the "Arishta" highlights the potential for physics and technology to contribute to societal safety. The project also provided the students with valuable hands-on experience in electronics, software development, and product design. While the device proved effective in its current form, future iterations could include additional features such as voice communication, GPS tracking, integration with smart devices, and improved power efficiency.

➢ Conclusion

The project "Arishta" was a successful initiative that addressed an important social issue. The collaboration within the Department of Physics demonstrated the potential for academic institutions to contribute to real-world problems. Devices like "Arishta" will make women more confident in daily life and help them to flourish without any barrier. The device, after further refinement, has the potential to be marketed for widespread use, offering women an additional layer of security and peace of mind.

➢ Acknowledgments

The project team would like to thank Shahid Matangini Hazra Govt. General Degree College for Women for the required funding of the project. The team would like to thank Department of Physics, Teaching and non-teaching staffs of the college for their support and guidance throughout the project. Special thanks to the students and staff who participated in the testing phase and provided valuable feedback.

This report provides a detailed account of the project undertaken by the Department of Physics at Shahid Matangini Hazra Govt. General Degree College for Women. The successful development and testing of "Arishta" represent a significant achievement and demonstrate the department's commitment to applying scientific knowledge for the betterment of society.

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Tamluk, Purba Medinipur

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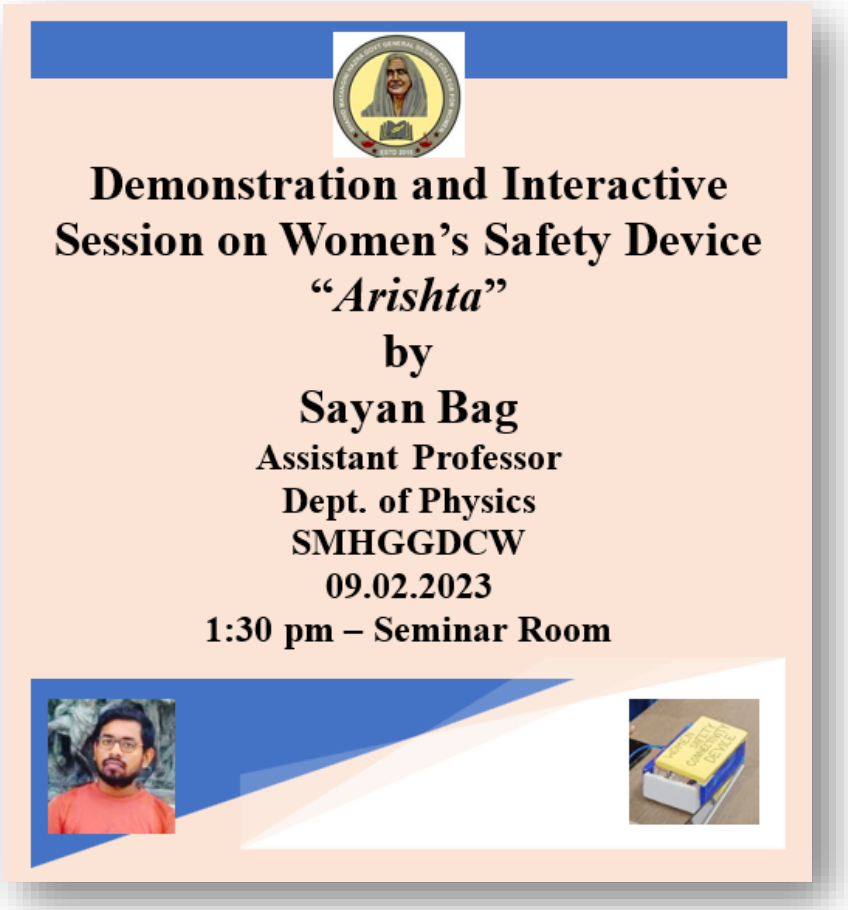

International Girls in ICT Day Observing
22.04.2022

International Day of the Girl Child
09.11.2022

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