WWW.IJRPR.COM

International Journal of Research Publication and Reviews

Journal homepage: www.ijrpr.com ISSN 2582-7421

A Community-Based Safety System for Colleges/Universities.

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DOI: https://doi.org/10.55248/gengpi.5.0524.1248

ABSTRACT

Ensuring student safety within educational institutions is paramount yet often overlooked. This paper proposes a software solution aimed at facilitating incident reporting and fostering a safer environment within universities and similar organizations. Ground-level research reveals existing committees dedicated to addressing issues such as ragging and women's safety, but a lack of online presence hampers their effectiveness in intervention and prevention.

Drawing from our participation in the Smart India Hackathon 2023, prompted by a challenge posed by the Government of Jharkhand, our solution focuses on developing a Community Based Reporting and Monitoring Tool for Women's Safety in Colleges/Universities. Central to our approach is the provision of a mobile platform to empower individuals, particularly women, to report incidents promptly and securely.

Utilizing location-based reporting, our software enhances the accuracy and responsiveness of incident management. By incorporating a non-anonymous reporting feature, we aim to foster trust and encourage broader community engagement. Furthermore, the implementation of an SOS system increases the efficacy of emergency interventions.

In summary, our solution seeks to seamlessly integrate into students' lives, offering a proactive means to navigate and address instances of harassment and misconduct within educational settings.

1. INTRODUCTION

Violence risk assessment, traditionally the purview of forensic mental health professionals in controlled environments like clinics, hospitals, or prisons, is increasingly relevant in university settings. This expansion necessitates an understanding of campus dynamics, which present unique challenges in managing threats of violence. Campus threats typically manifest in two forms: those with identifiable perpetrators and victims, often involving stalking behavior, and those involving anonymous or online threats of large-scale violence. While the former calls for violence risk assessment, the latter requires a threat assessment model. University administrators face complex issues in maintaining safety while upholding values of individual expression within an open and interconnected campus environment.

2. LITERATURE SURVEY

[1] explores the nuances of violence risk assessment in university settings, addressing the need for tailored approaches to ensure campus safety.

[2] talks about the key elements essential for an effective threat assessment team encompass robust administrative backing, comprehensive campus-wide education initiatives, and collaborative teamwork spanning various disciplines. These critical features are fundamental in fostering a proactive and coordinated approach to threat assessment, ensuring the safety and security of the university community.

[3] Stalking presents multifaceted risks, demanding clinicians to navigate vast amounts of data to assess potential dangers effectively. Understanding the context, motivation of the stalker, and victim behavior is crucial for successful management strategies. This synthesis is indispensable for crafting effective interventions and safeguarding victims.

[4] In contemporary workplaces and classrooms, the presence of mind-altering substances poses a heightened risk to employees and students alike. While the effects of drugs and alcohol vary widely among individuals, they can lead to disruptive behavior, threats, or impaired awareness of surroundings. Such compromised states pose risks to both the affected individuals and those around them.

[5] Stalking takes a heavy toll on its victims, causing significant mental health challenges such as fear, anxiety, and depression. As per the Sexual Victimization of College Women (SVCW) survey, 14% of female college students have reported being stalked since the start of the academic year.

[6] Despite nearly half of American women experiencing workplace sexual harassment, a small fraction actually reports these incidents.

[7] In another survey conducted among students, findings revealed that theft was the most commonly heard about or experienced on-campus crime, reported by 53% of people, followed by robbery at 32%. Further, over two-thirds of the students had been directly or indirectly victimized by on-campus crime at least once. Students were also asked to assess the safety of various locations, with 39% marked as safe and 61% as unsafe. Also, the majority of safe places (86%) were found within university campuses, mainly in accommodation, teaching, and research areas. Factors contributing to perceived safety included the presence of pedestrians (59%), the installation of CCTV cameras (29%), and well-lit environments (28%). Conversely, students identified 798 areas as unsafe, with the primary concerns being a potential risk of victimization (40%), traffic collisions (33%), and self-inflicted falls (27%). These insights shed light on students' perceptions of safety and security on campus.

[8] The concentration of the global population in complex urban environments due to rapid urbanization heightens the risk of conflict and insecurity. To protect urban populations and prevent future conflicts, it is imperative to improve urban planning, invest in youth livelihood programs, collaborate with local communities, enhance policing efforts, and bolster the capacity of judicial systems.

[9] The WoSApp mobile application utilizes the PhoneGap API from Cordova to trigger alerts to the police when the phone detects shaking. Furthermore, it incorporates seamless integration with local law enforcement agencies to ensure swift responses to emergency situations.

[10] iMace is a smartphone application crafted to protect women from sexual and violent offenders in their vicinity. It encompasses sensing, image acquisition, localization, and communication modules to thoroughly detect emergencies.Key features include panic situation detection and a "follow me" function allowing contacts to join the user's journey. However, real-time rapid intervention assurance is lacking.

[11] Stree Raksha is an Android application focused on empowering women's safety and security. Upon granting necessary permissions, users are presented with a home screen featuring seven card view buttons. These buttons include emergency SOS, hidden camera detector, women's news, siren, alarm, and app tour functionalities. However, the app does not incorporate community reporting features.

[12] This Android application, designed with context awareness and location-based features, is specifically tailored for tracking purposes within assisted living environments. It introduces innovative methods for messaging and networking, aiming to enhance user experience and efficiency. The app offers a unique solution for monitoring individuals requiring such services, providing a comprehensive approach to assisted living support.

[13] VithU is a mobile application that sends a message to pre-selected contacts automatically when the power button of the phone is pressed twice. This message includes the user's GPS location and is dispatched every two minutes with updated coordinates, ensuring timely updates on the user's whereabouts to their designated contacts.

[14] Nirbhaya is a mobile application intended to transmit a message comprising the user's GPS coordinates to a set of emergency contacts upon touching a button on the app screen. It consistently updates and retransmits the coordinates whenever there is a 300-meter alteration in location, guaranteeing that emergency contacts receive precise and prompt information regarding the user's location..

3. METHODOLOGY

Core components:

User-interface: The map of the college is shown along with the black spots and red time zones. A SOS button is present for emergency. The user also has an option to file anonymous/non-anonymous reports and track the same. There is a newsletter column where pie-charts/graphs are provided. If location is triggered, then a pop-up notification arrives if the user is navigating through a black spot or in a red time zone. It's important to note that users can only register or log into the application using their college email address.

Fig 1: User-interface

Authority interface: This interface is provided for the security personnel, the authorities incharge and the zone masters. Zone-masters serve as the primary first responders and oversee the processing of reports within a designated confined area, referred to as a zone. The university is segmented into multiple zones to reduce response time. The interface includes a report processing system, allowing authorities to manage and address reports collected from users. When a SOS is triggered, it is reflected immediately on the authority interface.

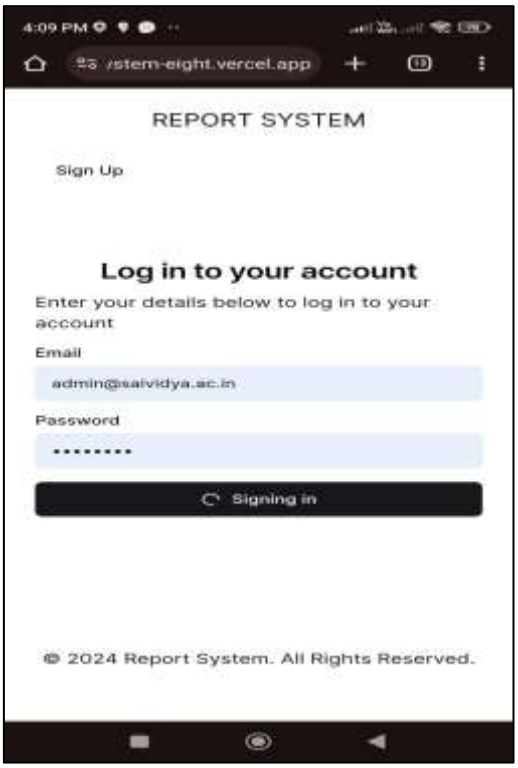

Fig 2: Authority Sign-In

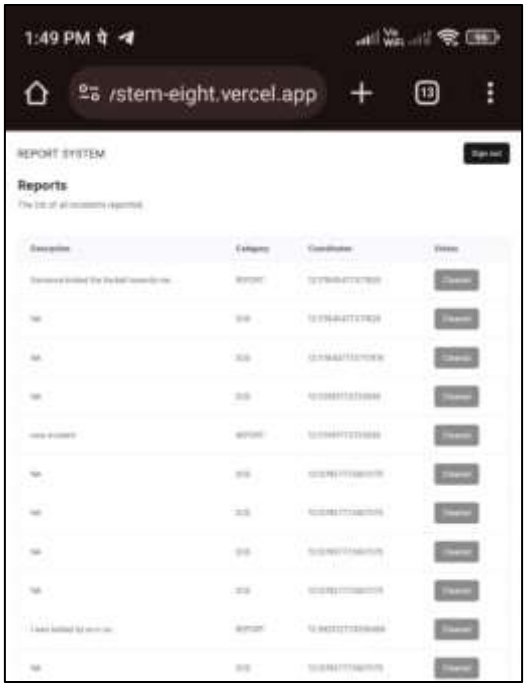

Fig 3: Authority Interface

Database: Consists of student database for login/signup system. Additionally, the system resolves the issue of reports generated outside the college premises by mapping each coordinate to the college's designated coordinates. If a student is outside the college limits, the report or distress signal will be forwarded to the police. Let us address about our product's core features:

Point-to-point reporting system: Utilizing location retrieval, we gather the aforementioned data points along with the user details for subsequent report processing. Once processed by the zone master and acknowledged by the student, the report will be displayed on the map without divulging the personal details of the student.

SOS Feature: This aims to solve the real-time rapid intervention requirement, when the SOS feature is triggered from the student end, her location will be retrieved and reflected on the map where the assigned zone master to that zone or any other security personnel, a teacher or even a student can intervene.

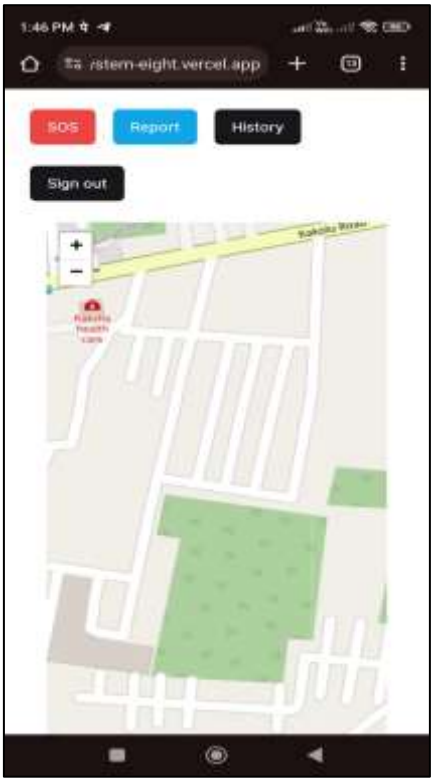

Fig 4: User Interface, with all the features

Report tracking and processing: The authority can access generated reports and take appropriate action based on the information provided. The student can track her generated report and view if action has been taken. No reports can be erased from the authority unless the student acknowledges the course of action. Spam reports can be dismissed since users are accountable, given that their details are available. If reports are not addressed/processed by the authority within two days, then it is is reflected as a permanent black spot on the map. If the generated report is legit, then it is reflected on the map as a black spot.

Predictive analysis model:

The generated reports are inputted into a predictive analysis model, which considers the incident's location and marks the location on the map with a black spot. It takes the time at which the report was generated and depending on the number of reports generated at any interval of time, the intensity of the colour red will fluctuate on particular locations of the college's map. Further, pie-charts/graphs that can give the user an idea of the location and time zones will be provided.

Anonymous/Non-anonymous reporting system:

On the occurance of an incident has to give a detailed description in text. Furthermore, the location will be collected irrespective of whether it is anonymous or non-anonymous. However, in the case of anonymous reporting, the student's email ID, name, and registration number will not be gathered. The student details will be collected if the report is non-anonymously generated.

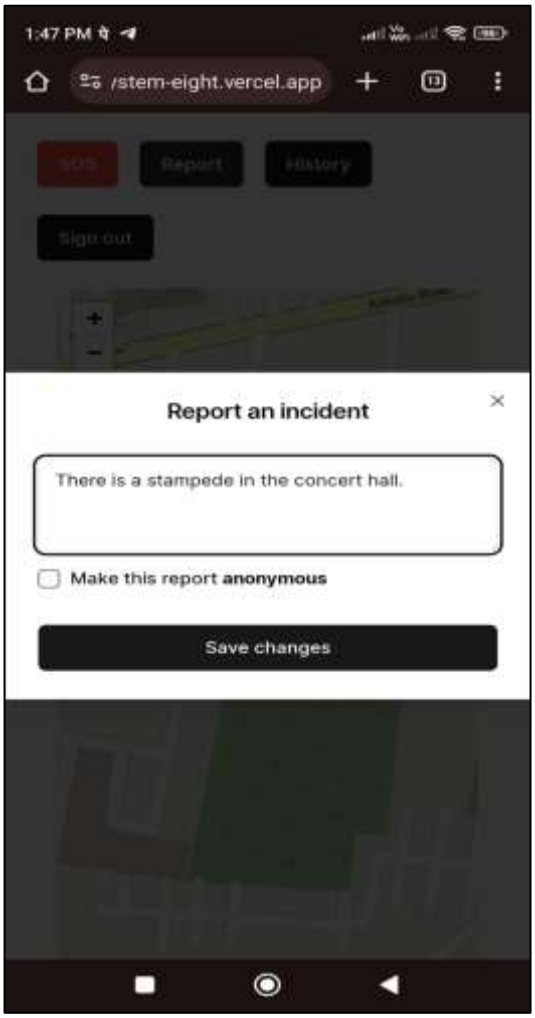

Fig 5: Reporting Feature

4. CONCLUSION

Our comprehensive solution represents a transformative step towards enhancing safety and security within educational institutions. Acknowledging the paramount significance of student safety in fostering their holistic well-being and academic progress, our platform is intricately crafted to tackle the diverse array of challenges linked with establishing a safe learning environment.

At the heart of our solution is a commitment to meeting the requirements outlined in our problem statement while also acknowledging the broader societal imperative of combating harassment and violence. By providing a dedicated platform for incident reporting, analysis, and intervention, we empower individuals to take proactive steps towards their own safety and that of their peers.

Importantly, our platform transcends traditional approaches to campus safety by leveraging cutting-edge technology and innovative features. Through the integration of location-based reporting and community engagement mechanisms, we not only streamline the reporting process but also enable stakeholders to gain deeper insights into safety trends and patterns.

One of the most significant innovations of our solution lies in its potential to serve as a metric for evaluating the safety and security of colleges. By allowing users to assess and rate colleges based on safety parameters, we introduce a new dimension of accountability and transparency to the education sector. Colleges are incentivized to prioritize safety measures and invest in security infrastructure to enhance their reputation and attract prospective students.

Furthermore, our platform has the capacity to promote collaboration and information-sharing between colleges, law enforcement agencies, and community organizations. By facilitating data-driven decision-making and fostering partnerships, we create opportunities for collective action and systemic change in promoting safety across campuses.

Moreover, our commitment to promoting safety extends beyond incident response to include proactive measures for prevention and intervention. By incorporating features like the SOS system and providing real-time updates, we guarantee that individuals have prompt access to assistance during emergency situations.

In conclusion, our solution represents a paradigm shift in how we approach safety and security within educational institutions. Through leveraging technology, fostering collaboration, and promoting community engagement, we enable individuals to assume responsibility for their safety and contribute to the establishment of safer and more inclusive learning environments. Together, we aspire to cultivate a future wherein every student experiences a sense of safety, support, and empowerment to flourish.

5. REFERENCES

[1] Regehr, Cheryl, Graham D. Glancy, Andrea Carter, and Lisa Ramshaw. "**A comprehensive approach to managing threats of violence on a university or college campus.**" International journal of law and psychiatry 54 (2017): 140-147.

[2] Cornell, Dewey. "**Threat assessment in college settings**." Change: The Magazine of Higher Learning 42, no. 1 (2010): 8-15.

[3] McEwan, Troy, Paul E. Mullen, and Rosemary Purcell. "**Identifying risk factors in stalking: A review of current research.**" International journal of law and psychiatry 30, no. 1 (2007): 1-9.

[4] Allen, Tammy J., and Linda G. Lengfellner. "**Campus violence: Improving safety in a university setting.**" Professional Safety 61, no. 02 (2016): 28-32.

[5] Amar, Angela Frederick. "**Behaviors that college women label as stalking or harassment.**" Journal of the American Psychiatric Nurses Association 13, no. 4 (2007): 210-220.

[6] Hart, Chloe Grace. "**The penalties for self-reporting sexual harassment**." Gender & Society 33, no. 4 (2019): 534-559.

[7] Huang, Dengkai, Vania Ceccato, and Marketta Kyttä. "**Safety perceptions in university campuses: the role of environment.**" Crime prevention and community safety 24, no. 3 (2022): 266-285.

[8] Patel, Ronak B., and Frederick M. Burkle. "**Rapid urbanization and the growing threat of violence and conflict: a 21st century crisis**." Prehospital and disaster medicine 27, no. 2 (2012): 194-197.

[9] D. Chand, S. Nayak, K. S. Bhat, S. Parikh, Y. Singh and A. A. Kamath, "**A mobile application for Women's Safety: WoSApp**," TENCON 2015 - 2015 IEEE Region 10 Conference, Macao, China, 2015, pp. 1-5, doi: 10.1109/TENCON.2015.7373171.

[10] Jou-Chih Chang, Pi-Shih Wang, Kang-Hsuan Fan, Shih-Rong Yang, De-Yuan Su, Min-Shiung Lin, Min-Te Sun, Yu-Chee Tseng, "**iMace: Protecting Females from Sexual and Violent Offenders in a Community via Smartphones**," 2011 40th International Conference on Parallel Processing Workshops, Taipei, Taiwan, 2011, pp. 71-74, doi: 10.1109/ICPPW.2011.57.

[11] Prof. Roshan Kolte, Prachi Tadse, Priti Nikhare, Vanshika Randive, Snehal Raut, Gayatri Narakhede. "**An Android App for Empowering Women's Safety and Security**." International Research Journal of Modernization in Engineering Technology and Science 5.4 (2023): 2804-2812.

[12] V. Hadjioannou, C. X. Mavromoustakis, G. Mastorakis, E. K. Markakis, D. Valavani and E. Pallis, "**Context awareness location-based Android application for tracking purposes in assisted living**," 2016 International Conference on Telecommunications and Multimedia (TEMU), Heraklion, Greece, 2016, pp. 1-7, doi:10.1109/TEMU.2016.7551934.

[13] VithU: V Gumrah Initiative on the Google Play Store: https://play.google.com/store/apps/details?id=com.startv.gumrah.Accessed: 2024-05-09.

[14] Nirbhaya: Be Fearless: http://www.nirbhaya.mobi. Accessed 2024-05-09.