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A System Based in Virtual Reality to Manage Flood Damage

Sudhakar Alluri[1], Komireddy Shreyas[2], Lingampally Ganesh[3] , Mangali Vamshi[4], Venkatapath Pallam[5]
[1, 2, 3, 4, 5]*ECE Department, CMR Institute of Technology, Medchal, Hyderabad, Telangana, India*

Abstract: ***Virtual Reality is seen as the high-end of human-computer interactions and it has the potential to target a wide range of applications. During the flood, it is difficult to communicate with the people by the rescue team from the helicopter.It is not possible to interact with Everyone directly. Because there won't be any mode of communication during the disaster.The VR system helps Communicate with the people. Redirected walking algorithms require the prediction of human motion in Order to effectively steer users away from the boundaries of the physical space. While a virtual trajectory may be represented using straight lines connecting waypoints of interest, this simple model does not accurately represent typical user behavior. We implemented the model within a framework that can be used for redirect walking within different virtual and physical environments. It Is useful For the evaluation of redirected of parameters under varying conditions. In the proposed system a projection is made from the helicopter to the ground.When a person stands on a specified location, that particular message is Gathered. This helps to communicate with the affected people.***

Index Terms: Wi Raspberry Pi, Energy Monitoring, Electric Power, Smart Meter, Data Communication

I. INTRODUCTION

Built environments, which refer to all physical environments constructed for human habitation And activities [1], are constantly exposed to Risk from various natural and manmade Disasters such as fires, floods, earthquakes, and terrorist attacks, which pose a significant threat to human Beings.

Take fire as an example; according to the statistics provided by the National Fire Protection Association (NFPA) [2], fires caused 3655 deaths, 15,200 injuries and $25.6 billion In economic losses in the United States in 2018. Considering the severity of emergencies, emergency Management is significant since it can reduce the Probability and impact of serious emergencies and Enable rapid restoration when emergencies occur [3].

Thus, it is necessary to emphasize emergency Management in built environments to ensure the safety and well-being of the public [4]. The broad Concept of emergency management covers hazard prevention, emergency preparedness (safety planning and training), emergency response (evacuation and Rescue), and disaster recovering restoration of fundamental services and lifelines) [5].

Studying Emergency management can help researchers and professionals gain a better understanding of the response methods needed for various disasters in order to improve emergency management measures and provide safer environments for residents in built environments. Despite the significance of studying Emergency management, disaster scenes are difficult to construct in real life, and forcing subjects to experience real hazards violates both law and morality. To address this problem, the use of novel Techniques in emergency research is essential, and the past two decades have witnessed the application of various emerging techniques in this area. Among them, virtual reality (VR), augmented reality (AR), And mixed reality (MR) are especially significant.

II. LITERATURE REVIEW

1.S.L. Handy, M.G. Boarnet, R. Ewing, R.E. Killingsworth How the built environment affects physical activity: views from urban planning The link between the built environment and human behavior has long been of Interest to the field of urban planning, but direct assessments of the links between the built environment and physical activity as it influences personal health Are still rare in the field.

Yet the concepts, theories, and methods used by urban planners provide a foundation foran emerging body of research on the relationship Between the built environment andphysical activity Recent research efforts in urban planning have focused on the idea that land use as well as walking and bicycling. The development of appropriate search[6].

Figure 1: View of Flood affected area from the helicopter.

III. METHODOLOGY

Community resilience as a metaphor, theory, set of capacities, and strategy for disaster readiness System This paper reviews the practice and research trends in disaster resilience and disaster risk reduction Literature since 2012 . It applies the rapid appraisal methodology to explore developments in the field and to identify key themes in research and practice. In particular, the paper examines how the emerging themes of disaster risk reduction from the Sendai Framework are being integrated into health risk management and disaster governance paradigms[7]. The research findings identify three important emerging Themes: socialization of responsibility for resilience; ongoing interest in risk management with an emphasis on public private partnerships as enabling mechanisms; and a nuanced exploration of the concept of adaptive Resilience[8].

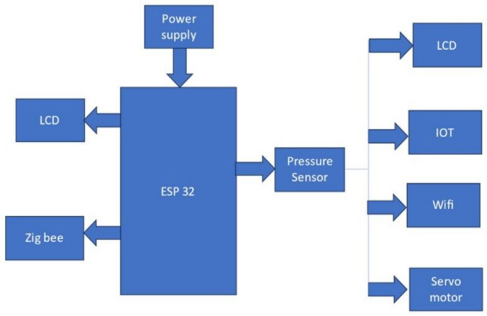


Figure 2: Block Diagram of Receiver Section.

Public education: VR experiences could be used to educate the public about flood risks and preparedless, promoting better community resilience. Remember that the information provided is based on the state of technology up until September 2021 and there might have been advancements or projects in the domain of virtual reality-based system for flood rescue management since then. To get the most accurate and up-to-date information, its best to conduct a more recent literature review or explored[9]

IV. REQUIREMENT SPECIFICATIONS

A. Hardware Requirement

1) Virtual Reality Projector
2) Camera
3) PC or Laptop
4) Arduino
5) DC Motor
6) IOT Transmitter
7) IOT Receiver
8) LCD Display
9) Relay
10) Power Supply

B. Software Requirement

1) Arduino IDE
2) Proteus
3) Open CV

Figure 3: Virtual Reality Projector

VR projection room is a, usually permanent, room where high-resolution content is projected onto the Walls, and sometimes the floor or ceiling, or both,To create an immersive environment.

Figure 4: Camera 360 Degrees

A VR camera offers an immersive viewing experience by capturing a 360-degree view of photos and videos. Move your head or pointer up, down , left, or right, And the video moves with you. To make and view this type of video, you'll need a 360 virtual reality camera And a computer or smartphone.

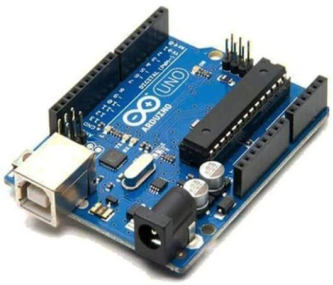


Figure 5: Arduino

Arduino is an open -source electronics platform based on easy-to-use hardware and software. Arduino boards Are able to read inputs - light on a sensor, a finger On a button, or a Twitter message - and turn it into An output – activating a motor, turning on an LED, publishing something online[10]. Although the hardware And software designs are freely available under Copyleft licenses, the developers have requested the name Arduino to be exclusive to the official product and not be used for derived works without permission. The official policy document on the use of the Arduino Screw-terminal breakout shield in a wing-type format, allowing bare-end wires to be connected to the Board without requiring any specialized pin[11]

Figure 6: Zig bee protocol

The ZigBee or ZigBee/IEEE 802.15. 4 protocol is a Specification created for wireless networking. It includes Hardware and software standard design for WSN (Wireless sensor network) requiring high reliability, low cost, low power, scalability and low data rate.

V. WORKING AND RESULT

The working principle of a virtual reality VR Based system For flood rescue management involves creating an immersive Virtual environment that replicates flood scenarious. User Wear VR headsets and interact with the environment using Controllers. Real time data from sensors and drones is integrated Enabling training coordination decision making, and public Awareness Remote experts can join the VR environment, and Post-flood assessment and recovery planning are supported. User performance is evaluated and data security is ensured[12].

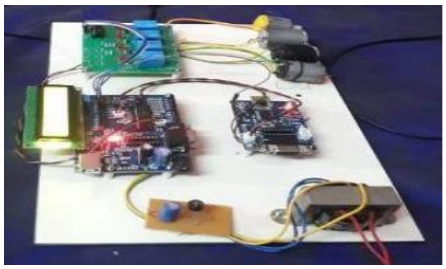


Figure 7. Results kit.

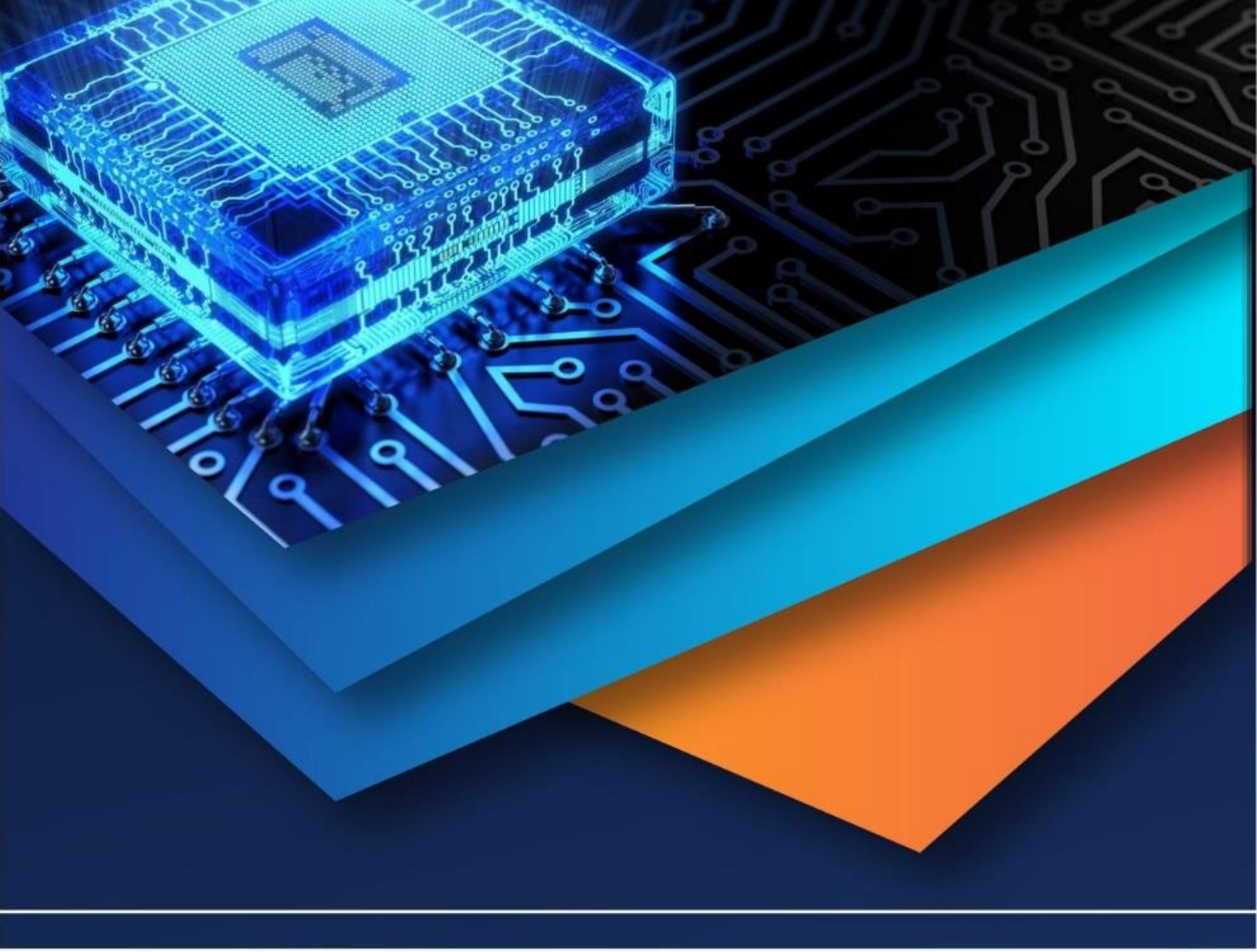
VI. CONCLUSION

In Conclusion the virtual reality-based system for flood rescue Management represents a promising and innovative Approch to enhancing flood disaster response. By immersing Rescue teams and decision-makers in realistic virtual environ Ments it offers valuable training, planning, and simulation Capabilities this technology allows for better improved Coordination, and more effective decision-making during Flood Emmergencies[13]. While the system holds significant Potential Its successful implementation hinges on continued Agencies integration with real-time data sources and widespread Adoption within disaster management agencies to maximize its Impact in mitigating the devastating effects of floods and Saving lives

REFERENCES

[1] Hicks, M., Burton, M.,"Hurricane Harvey: Preliminary Estimates of Commercial and Public-Sector Damages on the Houston Metropolitan Area", Ball State University, 2017
[2] Kapucu, N., "Collaborative emergency management: better community organizing, better public preparedness and response", Disasters 32.2: 239- 262, 200pproaches can prove useful in disaster Domain.8.
[3] Colin H. Green, S. M. Tunstall, & M. H. Fordham. "The risks from flooding: Which risks and whose perception?" Disasters 15.3: 227- 236, 1991.
[4] Demir, I., Krajewski, W., 'Towards an integrated Flood Information System: Centralized data access, analysis, and visualization', Environmental Modeling and Software, 50, 77- 84, 2013.
[5] Demir,I.,etal."FLOODSS: lowa flood information system as a Flood generalized cyberinfrastructure",International Journal of River Basin Management, 2017
[6] Meesters, K., Van de Walle, B., "Disapproaches can prove useful in disaster domain. ster in my backyard: A serious game introduction to disaster information management." In ISCRAM. 2013.
[7] Ren, A, et al. "Application of Virtual Reality Technology to Evacuation Simulation In Fire Disaster." In CGVR, pp. 15-21. 2006.
[8] Rohith R Krishnan, Sushil S, R Hrishikesh ,Sayooj Devadas, Ganesh A and Gayathri Narayanan,"A Novel Virtual Reality Game for Diaster Management Applications",IEEE on Communication and Signal Processing,2019.

[9] Shangwei Zhang and Jiajia Liu,"Analysis and Optimization of Multiple Unmanned Aerial Vehicle-Assisted Communications in PostDiaster Areas",IEEE Transactions on Vehicular Technology,2018.
[10] Angelica Pearl Francis, P. Venkatapathi, M. Shiva Kumar, Dr. M. Sreedhar Reddy4 "Embedded System Application on Shipping Surveillance and Control" International Journal for Research in Applied Science & Engineering Technology Volume 9 Issue IV Apr 2021
[11] Yunbo Li,Aobo Li,Tiejun Cui,Danial F Sievenpiper,"Multi Wavelength Hologram Designed using Impedences Metasurfaces", IEEETransaction on Antennas and Propagation,2018.
[12] Frode Eika Sandnes,"Drawing Abrasive Hologram Animations with Auto Generated Scratch Patterns",IEEE International Conferences onMultimedia,2017.
[13] Li De,"A Forensic Marketing Algorithm Based on DWT-SVD using Hologram",IEEE International Symposium 2011.



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