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Empower-Women: Self-defense Training using Virtual Reality

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ABSTRACT: There are countless reports of people being sexually and physically assaulted everyday. Public attention to sexual assault has increased dramatically over the last decade, spurring questions about how it can be prevented. One approach that has received scant attention is women's self-defense training (sometimes known as sexual assault resistance training). This neglect is curious because empowerment-based women's self-defense (ESD) training is so far the only approach that has produced substantively significant decreases in victimization rates. In this paper, we propose such a training system based on the motion capture system (VR). The system automatically analyzes the motions of the player and gives suggestions. The students can also view the self-defense techniques stored in the system or their own techniques captured by the motion capture system from various points of view in order to gain objective ideas of the self-defense techniques to train themselves in that such environment.

KEYWORDS: Virtual reality, self-defense training, web-based learning, automatic motion analysis, motion capture, women empowerment.

I. INTRODUCTION

The goal of virtual self-defense classes is to teach women the skills they need to prevent and respond to violence. These classes are distinguished by their attention to two related dimensions of women's experience. First, the specific focus of these classes is sexual violence against women, including rape and sexual assault, although the lessons learned may also be applicable to other types of violence, from sexual harassment to nonsexual assault to relationship violence. Classes are generally limited to female students, because women are far more likely than men to experience sexual violence, and the physical skills taught are well-suited for women's bodies (i.e., they tend to rely on lower rather than upper body strength), for rapid learning, and for sexual assault situations. These classes contrast with traditional martial arts training (generally a long-term course of study where defensive skills may take years to develop) and much traditional self-defense training (which, like martial arts training, is not generally focused on sexual assault situations or physical techniques adapted to women's bodies). Second, virtual self-defense classes address the gender socialization and inequalities that make physical and verbal self-defense challenging for many women. On the other hand, there are people who are interested in learning self-defense but do not want to join such groups or classes due to some bad experiences or their own busy schedules that they cannot attend classes regularly. Some of these people usually practice self-defense technique themselves at home by watching videos or reading books. However, this is not an efficient way to learn self-defense, as they have no feedback from the coach, and therefore, they may not realize it even if they are moving in a wrong way. Another disadvantage of learning yourself is that you have no chance to do combinatory practice with that such environment, which is very important in self-defense. VR self-defense classes teach skills for preventing and responding to violence. However, self-defense training has many other positive effects on women's lives—effects that themselves may reduce women's risk of assault. Traditionally, when people want to learn self-defense, they have to go to training clubs and learn under the coach together with the other students. To reduce the tuition fees, there are usually a lot of students under a single coach and hence, it is difficult for the students to get enough suggestions in the class. It would be far easier if the students could practice themselves at home and ask for suggestions from a virtual coach in the computer. Occasionally, in case they find difficulties going to the next step, they may then approach the real coach for suggestions and training. In this paper, we propose such a training system based on the motion capture system. The system automatically analyzes the motions of the player and gives suggestions. The students can also view the self-defense techniques stored in the system or their own techniques captured by the motion capture system from various points of view in order to gain objective ideas of the self-defense techniques to train themselves.

Virtual Reality: Virtual Reality (VR) is the use of computer technology to create a simulated environment. Unlike traditional user interfaces, VR places the user inside an experience. Instead of viewing a screen in front of them, users are immersed and able to interact with 3D worlds. By simulating as many senses as possible, such as vision, hearing, touch, even smell, the computer is transformed into a gatekeeper to this artificial world. The only limits to near-real VR experiences are the availability of content and cheap computing power.

WHAT IS WOMEN'S SELF-DEFENSE? It is important, first, to distinguish between the practice of self-defense in an assault situation and self-defense training; these two meanings of the term “self-defense” are often confused. The practice of self-defense involves women's use of any of a range of strategies—be they physical, verbal, or emotional—to deter an imminent assault or resist an assault in progress.

DOES PRACTICING SELF-DEFENSE USING VR REDUCE THE RISK OF SEXUAL VIOLENCE? As noted above, a range of studies have found that between 70% and 80% of women employ some sort of self-protective strategy when faced with an assault. Scholars typically divide these strategies into four basic categories: forceful physical strategies, such as punching or kicking, forceful verbal strategies, such as yelling or threatening, nonforceful physical strategies, such as removing the offender's hand or running away, and nonforceful verbal strategies, such as pleading or crying (Santana, 2010; Ullman, 1997, 2007). As grasping the ideas and training themselves with virtual reality they will get mentally more trained.

Training:Self-defense is the training and techniques necessary to defend yourself when targeted by crime or violence. There will always be thieves who want to take what isn't theirs, and predators who want to hurt or humiliate others. When you train in self-defense, you gain the tools to protect your family and stay safe from danger.

What is VR in self -defense training?Virtual Reality in online training is all about **mistake-driven learning**. Users have the power to fail, try out new solutions, and see where their choices lead them in a risk-free setting. They can see how they'll react in stressful situations and identify performance gaps that are standing in their way.

II.RELATED WORK

In order to reduce the sexual assaultself-defence training must be estimated. This section gives a brief description about self-defence using VR and the survey used to extract their reasons. It also describes existing similar projects.

III.METHODOLOGY

We took an online survey with the help of google form. The link of the form was circulated in social media platforms. The questionnaires in the form were designed to test the proposed hypothesis and result.

Hypothesis:If we use virtual reality for women self-defence training then most of the women will be more interested in learning self-defence and trained herself easily without going any offline classes because by using VR app women will be able to trained herself anytime, anywhere and at any place.

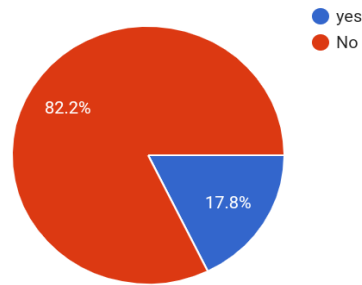
IV.EXPERIMENTAL RESULTS

Figures shows the results of hypothesis we proposed, the data presented here are drawn from survey of women based , who enrolled in women self-defence questionnaires . fig (a) shows that how many women are already taken a offline self-defence training or not and result which had came is 82.2% of women not taken a self-defence and 17.8% women had taken already which as shown in the below fig (a). fig(b) and fig (c) indicates that the who taken a self-defence training she is most confident.



Have you ever taken a self-defense class before??

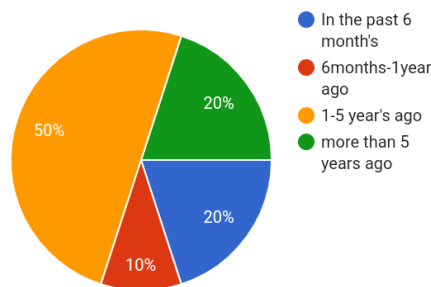
45 responses



(a)

If yes, when did you take it?

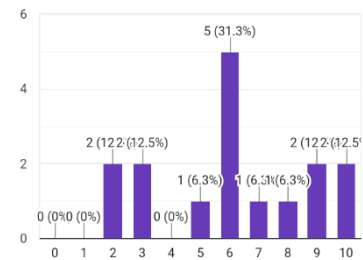
10 responses



(b)

If yes, how confident do you feel about your self-defense skills?? (10 is most confident)

16 responses

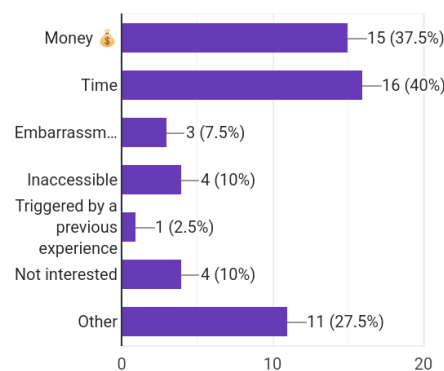


(c)

Fig. 2. The below fig (a) indicates that almost 70% of female had not taken a self-defence just because of money, time, inaccessibility and embarrassment.

If No, why not?? (choose as many as you like)

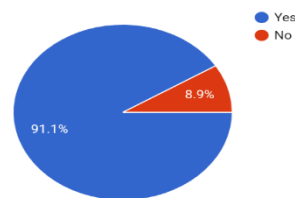
40 responses



(a)

Fig. 3 The below figure indicates that 45 out of 40 females will be interested to take self-defence training if it is provided virtually using virtual reality. We proposed the hypothesis based on this below fig question ,so result show that 91.1% women is interested to take self-defence training in VR.

would you be?Interested in learning self-defense in a private virtual reality (VR) app.if it were offered by your workplace, school etc. -----
 ||-----||----- Note:- virtual reality self-defense is a App which provides a dummy for the user to practice a set of moves and trained ourselves..!!
 45 responses



V.CONCLUSION

We proposed a virtual self-defence trainer, that is intended for women of third world countries belonging to conservative families. This paper is proposed for women self-defence training using virtual reality. In future we have planned to design women self-defence training using VR and also a full body motion tracking device to track the user motion in the game. The results of the overall pipeline are quite satisfactory. There is no ground truth to check whether the features extracted are correct however, the end result validates the system performance.

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