

VisuaLax: Visually Relaxing Augmented Reality Application Using Music and Visual Therapy

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Abstract. The study promotes Visualax which is a visually relaxing augmented reality application that uses music and visual therapy. It is an alternative tool for managing the mental stress level of an individual. The developed system enables the users to relax and unwind anywhere at anytime. The goal of the software is to reduce the stress level of the user through audio and visual presentation alongside with the integration of augmentation of the original setting and application of appropriate concepts from music and visual therapy, with the aid of a web camera. To test its efficacy, the software is evaluated by the 44 Bachelor of Science in Computer Science (BSCS) third year students from the Polytechnic University of the Philippines, College of Computer Management and Information Technology and 15 Experts from Delos Santos-STI Medical Center. Based on the perception and the data gathered from the two (2) groups of respondents, VisuaLax can be an alternative tool for managing the stress of an individual. The degree of likelihood of both respondents signifies that the system is successful for introducing and developing the usage of Augmented Reality in e-health particularly in stress management.

Keywords: E-health, E-psychology, Augmented Reality, 3D Animation, Virtual Reality, Computer Graphics.

1. Introduction

Health is always been an important factor for every one of us and we take in consideration the time we can allot for maintaining the fitness of not only our body but also our mental capabilities. [1] With the emergence of e-health, different medical services that use technology to provide assistance and support for treatments can now be accessed anytime. [2]

Currently, there are few applications that utilize augmented reality in the field of medicine. Aside from that, the systems available nowadays are using the chatting-type of psychological counsels regarding stress-related problems. These systems requires education and training, mental focus and certain amount of time, and yet the results are sometimes inconsistent.

Thus, the researchers came to the idea of developing an alternative tool for managing the mental stress of an individual using the concept of augmented reality as the main technology, which is integrated with the essential ideas of music and visual therapy. [3][4][5]

2. The Developed System

2.1. System Architecture

Figure 1 shows the common system architecture of augmented reality applications. The basic augmented reality software is generally composed of two main parts, the image registration and the augmentation part. The image registration derives real world coordinates using different methods of computer vision and use feature detection methods. The augmentation part restores a real world coordinate system from the data obtained in the image registration and adds images or objects to the setting.

The VisuaLax: Visually Relaxing Augmented Reality Application Using Music and Visual Therapy's System Architecture mainly involves four phases: Stress Level Evaluation, Image Detection, Augmenting Reality and Stress Level Re-evaluation.

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In Stress Level Evaluation, the stress level of the user will be determined or identified through pre-testing. Image Detection Phase is where the real setting of the user is being tracked.

Augmentation Phase runs simultaneously with the Image Detection Phase to do real – time augmentation and incorporates the music and visual therapy. The Stress Level Re- evaluation is the last part of the system that will determine if the augmentation and the therapies used fulfill the purpose of the software which is to lessen the stress level of the user.

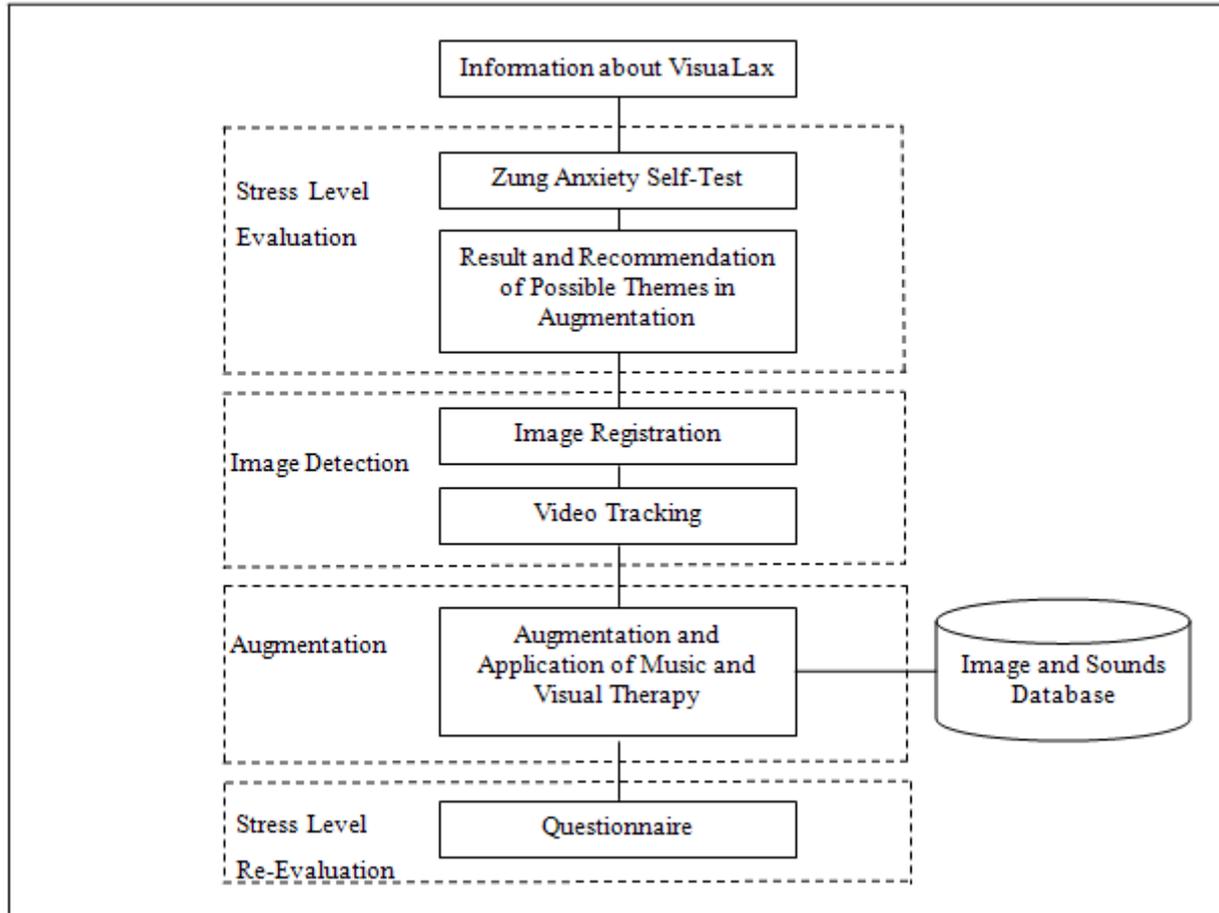


Fig. 1: System Architecture of VisuaLax: Visually Relaxing Augmented Reality Application Using Music and Visual Therapy.

The basic information, purpose and ability of the VisuaLax will be stated in the start of the program. Before proceeding, the user will have to undergo the Zung Anxiety Self-Test to determine the level of stress under the Stress Level Evaluation Phase. The recommendation of appropriate themes in augmentation result was shown and determined from the result of the questionnaire. After the user has chosen the theme for the augmentation, the Image Detection phase occurs. It is started by the Image Registration then the Video Tracking and was immediately followed by the Augmentation phase immediately. The Image Detection Phase and the Augmentation phase are continuous to do real – time augmentation with music and visual therapy. After the session or the user stops the augmentation, another test was given to do the Stress Level Re-evaluation Phase.

2.2. Software

VisuaLax is an application designed as a tool to manage mental stress that utilizes augmented reality technology. It determines the level of stress of the user with a test material used in the field of psychology and proposes themes applicable for the user. VisuaLax presents real-time augmentation of the current setting of the user with a new environment, with the use of a marker; the application will integrate it with the appropriate music depending on the user’s stress level. Its use, however, should be with the guidance of a psychology expert to achieve its fullest potential.

The programming language that was used to develop VisuaLax is the C# language using Visual Studio 2010 of Microsoft™ as the Integrated Development Environment (IDE) of the software. It is a windows form application project under the .NET 4 Framework. Adobe Flash Professional CS5 and the open – source Augmented Reality (AR) Toolkit was used in the development of the Augmented Reality of the system.

Fig.2 shows the main interface of VisuaLax. The main interface of the system primarily contains the logo and the name of VisuaLax. The START button located at the bottom part of the screen is the one that will trigger the system to proceed with the Zung Self Anxiety Self-Test.



Fig. 2: Main Interface of VisuaLax: Visually Relaxing Augmented Reality Application Using Music and Visual Therapy.

Fig. 3 shows the Zung Anxiety Self-Test. It is a 20-item self-assessment tool built to measure anxiety levels. The scoring will depend on the indication of how much each statement applies to the user. Each question is scored on a Likert-type scale of 1-4 based on these replies: "a little of the time," "some of the time," "good part of the time," "most of the time". [6]

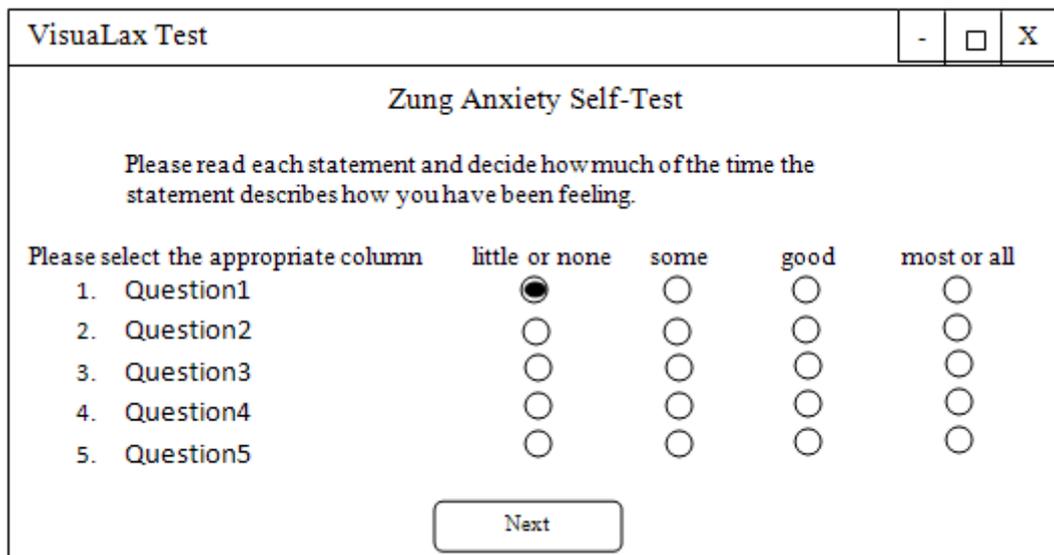


Fig. 3: Zung Anxiety Self-Test of VisuaLax: Visually Relaxing Augmented Reality Application Using Music and Visual Therapy.

Overall assessment is done by total score. After answering all the questions, the next process will be the augmentation part wherein the system will suggest themes depending on the anxiety level of the user.

3. Research Design

The research methodology used in the assessment of the system is the descriptive method. However, the Iterative Software Lifecycle was utilized as the research paradigm. The researchers used Simple Random Sampling Technique to gather data and the evaluation was done through survey forms. Weighted Mean and T-test were used for the computation of the results and Likert Scale was used to identify the degree of likelihood and interpretations. The respondents evaluated the developed system in terms of its user friendliness, its usefulness, and its functionality.

4. Discussion and Result

The data were gathered from 44 BSCS Third year students from the Polytechnic University of the Philippines-College of Computer Management and Information Technology and 15 Experts from Delos Santos-STI Medical Center.

Table 1 depicts the Overall Assessments of the Respondents on VisuaLax. It illustrates that the students rated the system with a weighted mean of 4.246 which is interpreted as Agree. The students perceived the developed Visualax as user friendly, useful, and functional.

Table 1: Overall Assessment of Respondents on VisuaLax: Visually Relaxing Augmented Reality Application Using Music and Visual Therapy.

Criteria	Students		Experts	
	Weighted Mean	Verbal Interpretation	Weighted Mean	Verbal Interpretation
User Friendliness	4.37	Agree	4.52	Strongly Agree
Usefulness	4.16	Agree	4.46	Agree
Functionality	4.21	Agree	4.37	Agree
Overall Assessment	4.246	Agree	4.45	Agree

In addition, the overall assessment of the experts to the software earned a weighted mean of 4.45 which is interpreted as Agree. Analyzing the result, the system’s weighted mean with regards to user friendliness obtained the highest rate amongst the other parameters with a weighted mean of 4.52 which is interpreted as Strongly Agree.

Table 2 illustrates the Comparison of Assessments of the Respondents on VisuaLax: Visually Relaxing Augmented Reality Application Using Music and Visual Therapy.

Table 2: Comparison of the Assessments of Respondents on VisuaLax: Visually Relaxing Augmented Reality Application Using Music and Visual Therapy.

Criteria	Students	Experts	X ₁	X ₂	t-value	Decision
	Weighted Mean	Weighted Mean				
User Friendliness	4.37	4.52	4.246	4.45	1.2496	1.2496 < 2.0025 Accepted
Usefulness	4.16	4.46				
Functionality	4.21	4.37				

Given the degree of freedom of 57 and critical value of 0.05, the decision came out that $1.2496 < 2.0025$. Therefore, VisuaLax is accepted and proved that there is no significant difference between the assessments

made by the BSCS Third year students and the Experts in terms of its user friendliness, usefulness, and functionality.

5. Conclusion and Future Works

Based on the perception and the data gathered from the two (2) groups of respondents, VisuaLax can be an alternative tool for managing the stress of an individual. The degree of likelihood of both respondents signifies that the system is successful for introducing and developing the usage of Augmented Reality in e-health particularly in stress management. Thus, the researchers also concluded that to achieve the optimal effect of the system, the users must constantly monitor their stressful habits. Also, proper medical consultation from the appropriate specialist must be done.

In the future, the authors will extend their works on the following:

- Conduct a study for the effectiveness of the system to the user in terms of its medical purposes.
- Utilize the use of a marker-less to improve the efficiency of the augmented reality application.
- Include recording of sessions for future reference of the users and experts.

6. References

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