

*3D Virtual Environments of Royal Temple in Thailand
(Wat Yannasangvararam) Phase I*

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Abstract

Thailand has many invaluable cultural heritages found in various areas, particularly historical heritage, arts, architecture, and the way of life, which attract tourism in Thailand at the present. Although, some heritages have not properly been kept in good condition or used for arts and appreciation of intelligence of locality. Wat Yannasangvararam is a Buddhist place with a long history, located in Amphur Banglamung, Chonburi province, Thailand, founded in 1976. His majesty the King Rama IX, the present King of Thailand, has given this temple as the first class of royal monastery of Ratchaworamahawiharn and kept the temple under the royal patronage of the king. This research was to distribute knowledge about Thailand's cultural heritage and develop a model representing historical places in the form of virtual 3D computer graphic model with 3D environmental condition. The 3D computer graphic processes are as follows: 1) Pre-production: problem defines and study, draw maps, determine walking zone in the temple 2) Production Picture: 3D model character, shading and texturing, light and shadow, rendering and interactive and 3) Post-production: research validation by experts. The virtual 3D computer graphic model presented in both Thai and English language, which is compatible with personal computer, mobile phone and tablet, can lead to further education for students, undergraduates and people and conserve Thai culture. The results showed that The idea of creating the first three-dimensional media follows: 1. History of the Wat Yannasangvararam temple. 2. Architecture 3. Wat Yannasangvararam Environment. To lead to the cognitive development on virtual 3D computer graphic. Order to generate awareness to the importance of Wat Yannasangvararam.

1. INTRODUCTION

Thailand has a precious cultural heritage. Especially historical legacy of art, architecture and lifestyle was featured to the Tourism of Thailand [1], which refers to the Royal temples are built or renovated by a king or built by a member of royalty or the nobility and dedicated to the king, or even built by any well-to-do person who then requested to dedicate the temple to the king and it was accepted as such. They are divided into first, second and third class temples in a descending order of significance. The temples in each class are graded by a further ranking order which precisely identifies their position in the hierarchical system. This ranking system for royal temples was initiated in 1942 (King Rama VII).

Wat Yannasangvararam was founded in 1976 by Somdet Phra Yannasangvorn the Supreme Patriarch of Thailand, built as a dedication to H.M. King Rama IX, the present reign, for His Majesty's perfection of tenfold virtues of king and all his effort aiming for happiness and elim with generous supports from the Royal Family. Located on a tapioca field surrounded on three sides by hills and mountains and the fourth side by the Gulf of Thailand, Wat Yan is 160 kilometers east of Bangkok and 20 kilometers east of Pattaya Beach Resort on the road to U-tapao airport. During the Rains Residence (July to October) there are about 70 to 80 monks in residence and 40 or so monks at other times. The monks belong to the Theravada Dhammayuti lineage and observe practices of the Thai Forest Traditions which include the daily routine of: 1. going out on alms-round. 2. Eating one meal a day. 3. Putting all the food in and eating from the bowl. 4. Attending morning and evening (6:00 PM) sessions of chanting and meditation. 5. Sweeping the grounds and paths and keeping everything neat and clean. The Wat Yannasangvararam also provides opportunity for lay people to come and stay for individual retreats of long or short duration. However, there are does not major received attention and utilized, such as the awareness of indigenous knowledge. Thus, Researchers have to develop Virtual Environments of Royal Temple in Thailand (Wat Yannasangvararam). Designed specifically to users aware of environment and three-dimensional objects, like that of a real Interaction between user and computer objects. User was receiving information and virtual image including virtual view with normal vision. Useful for users and educational. These can be translated to an abstract and tangible. In addition These media not only serve their users well in providing human knowledge of a wide array of cultural heritages in increasingly robust and cost-effective formats but also create a society of participatory learning and a wide sharing of knowledge.

2. LITERATURE REVIEW

The virtual reality systems is an education system based on the Virtual Reality technology that models conventional real-world education by integrating a set of equivalent [virtual](#) concepts for virtual homework, virtual classes, virtual tests, virtual classrooms, virtual museums, virtual library and other external academic resources [2]. Immersion in VR is achieved with the disappearance of an artificial interface, replaced by natural every day's actions present in the real world. This is one of the key aspects of VR that brings together many researchers to support it. Some other advantages of immersion are not so obvious, but very important for justifying the use of VR in education, such as: VR enables first person experiences, which are natural,

unreflect and personal, generating direct, subjective and personal knowledge. VR provides a less symbolic interaction with the environment. Any description of an experience or action is usually transmitted through of symbols, conventions and formalisms, meaning that traditional learning of a concept require previous knowledge. VR have the potential to allow learners to discover and experience objects and phenomena in ways that they cannot do in real life [3] [4].

Virtual Reality (VR) in our understanding, is multimodal interaction with dynamic and responsive computer generated or so-called synthetic environments [5] [6]. The main focus is on interaction, which combines adequate presentation of the environment with its manipulation. Multi-modality defines the more hardware-oriented interface definition as the combination and cooperation of various input and output channels like speech, gesture, sound, position, video, and so on, which distinguishes the interface channels more from the point of media instead of the sensory perception. Dynamic behavior introduces the notion of time into virtual environments. A highly interactive system has to deal with time in general and specifically with variable time frames and their synchronization. Responsive virtual environments should operate in real-time, that is, the response time and update rate of the system is high enough so that the boundary between user and virtual environment, the so called interface, seems to vanish. This property is one of the major differences between VR systems and other 3D systems such as CAD systems. In our experience real-time cannot be quantified in general, it depends on the application domain. Flight simulations have higher requirements (60Hz or above) compared to design evaluation tasks where response rates above 10Hz seem to be sufficient.

These techniques serve one main purpose: the enhancement of human computer interaction. Especially in problem domains of high complexity, the use of immersive virtual environments promises a better insight. Immersion in our opinion is a result of the used techniques and surrounds the user with the computer generated world, which seems to be a different experience compared to classical interfaces. Obvious examples are complex evaluation or planning tasks like architecture or design, medical training, fluid dynamics in engineering or assembly planning.

VR-development-systems made large progress during the last few years. It is not only more powerful hardware, but also higher-level development libraries and toolkits that greatly reduce the effort needed for creating and rendering virtual environments, especially for visual output. For instance, systems such as IRIS Performer [7] automate tasks such as render tree traversal, culling of invisible geometry, display list creation, and multiprocessing, which are all used to consume a large portion of development time.

Virtual environment [8] displays arose from vehicle simulation and teleoperations technology of the 1960s. They are interactive, head-referenced computer displays that give users the illusion of displacement to another location. Different terms have been applied to the illusion. Some, like the oxymoronic "artificial reality" and "virtual reality", suggest much higher performance than current technology can generally provide. Others, like "cyberspace" are puzzling neologisms. Expressions like "virtual worlds" and "virtual environment" seem preferable because they are linguistically conservative, relating to well-established terms like virtual image. In fact, we can

define virtual environments as interactive, virtual image displays enhanced by special processing and by nonvisual display modalities, such as auditory and haptic, to convince users that they are immersed in a synthetic space. Why are these displays useful? Who uses them? How are they developed? The article addresses these and other questions related to this emerging technology.

3. THE APPROACH

The 3D computer graphic processes are as follows: 1) Pre-production: problem defines and study, draw maps, determine walking zone in the temple 2) Production Picture: 3D model character, shading and texturing, light and shadow, rendering and interactive and 3) Post-production: research validation by experts. The virtual 3D computer graphic model presented in both Thai and English language, which is compatible with personal computer, mobile phone and tablet, can lead to further education for students, undergraduates and people and conserve Thai culture. See Figure 1.

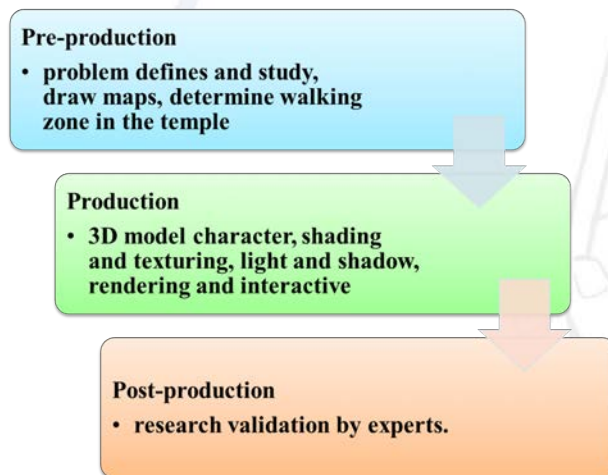


Figure 1. Research framework

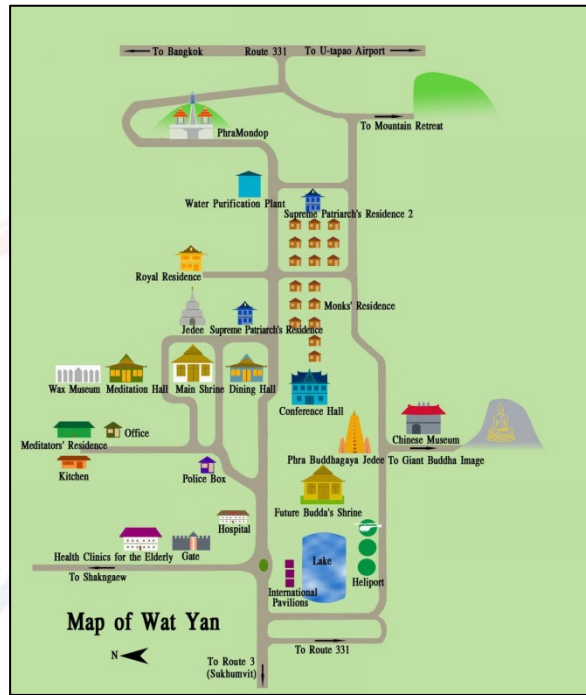


Figure 2. Map of Wat Yannasangvararam



Figure. 3 Picture Turntable



Figure 4. Create 3D Model

4. CONCLUSION AND FUTURE WORK

The results showed that The idea of creating the first three-dimensional media follows: 1. History of the Wat Yannasangvararam temple. 2. Architecture 3. Wat Yannasangvararam Environment. To lead to the cognitive development on virtual 3D computer graphic. Order to generate awareness to the importance of Wat Yannasangvararam.

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