The Application and Prospect of Kinect in Architecture

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Abstract

Kinect first feature developed by Microsoft is the application of somatosensory interactive auxiliary equipment. Kinect does not require hand-held controller or stampede as it is the use of voice commands or gestures or even eyes can interface computer's operating system. At the same time, kinect can capture action figures upper and lower body, with the body to the game, to bring people "controller-free interactive experience." In the latest development, kinect tracking that greatly expand the usability for virtual reality has also joined the line of sight, three-dimensional scanning and 3D printing. Development of interactive technology is the future trend, and the current building design have spawned many new features through Kinect. Kinect in the future will be more involved in all aspects of life.

Keywords

Architectural ;Kinect; Virtual Reality.

1. Introduction

Kinect initially called Natal that means newborn is Microsoft's official name in the United States November 4, 2010 launch of the XBOX360 game body sense of peripherals. Kinect was primarily designed for natural interaction in a computer game environment (PrimeSense, 2010). However, the characteristics of the data captured by Kinect have attracted the attention of researchers from the field of mapping and 3d modelling [1]. It is actually a 3D somatosensory camera that allowing the player to get rid of the shackles of traditional gamepad by the use of real-time motion capture, image recognition, microphone input, voice recognition, community interaction and other functions. Also, kinect enables players to interact with the Internet, share pictures, audio and video information through their own body to control the game.

2. The application of kinect in non‑building

2.1 Robot control

One key long-term goal of developing remote robot control system via local network and Internet requires a human-friendly interface that transfers information of guidance or other types or commands [2]. Japan's nuclear leakage disasters tell the world: many cases are not suitable for humans to work. Robots especially humanoid robot on many occasions have value that be controlled better by kinect. Micro UAV widely prospects, especially suited to perform specific tasks in the complex environment of the city near the ground, interior, mountains, canyons, jungle, etc. However, real-time monitoring is the biggest problem. Realize autonomous flight is the future trend of the UAV, it is a good choice to solve the real-time monitoring. However, the current sensor is difficult to meet the needs of Micro UAV to realize autonomous flight. Kinect appears to realize autonomous flight offers good choice. Stanford University, University of Pennsylvania and University of Canterbury in New Zealand are being carried out this research. GRASP Laboratory of the University of Pennsylvania, in a small four-rotor aircraft assembly platform above a Kinect, can the surrounding environment and thus perceive 3D modeling environment, to achieve a specific autonomous flight in the laboratory. With Kinect for further development and research, it will greatly reduce development costs and the use of robots. In the near future, the robot will be out of the lab, large-scale commercial production, for use in all walks of life, into millions of households.

2.2 Dressing Mirror

Owing to technological advances, online shopping has become very popular recently. Virtual mirror projects provide support for online shopping by offering the facility of selected clothes try-on. Therefore, users can see how they look in the clothes without physically putting them on, and without spending a lot time [3]. Virtual fitting has been developed for a long period of time. This is the latest online very fire a dressing mirror video. In Russia, the United States there has been a lot of Kinect associated electronic shopping guide system. I believe that with the popularity of Kinect, e-commerce will have a better ability to express. Combined with Kinect apps and augmented reality technology, you can create a virtual dressing mirror, try to provide the most convenient and facelift 3D experience. Customers do not need to try, you can see all kinds of jewelry worn hat 3D effect, you can easily replace the clothing style, without having to repeatedly put on his clothes off so time-consuming operation. In the context of online shopping SEN Kinect application development team to establish a network of virtual fitting room. User experience to achieve real try and dress up the process in the video, multi-angle all-round feel of the actual coat worn effect. European boutiques Topshop flagship store in Moscow installed this virtual dressing mirror as shown in the figure 1 below [4].

Fig. 1 dressing mirror

2.3 Motion Capture

Motion capture is very important in the film animation production. Motion capture technology a lot, but Kinect cost is very high. Japanese virtual idol Hatsune Miku popularity Wang, the synthesis of singing + holographic projection created a unique sense of the scene. If accompanied by Kinect, we can live in real time and interact with the audience, and that is very shocking.

This huge wall interaction through Kinect For Windows sensor control, can display 198 interactive image area as shown in the figure 2 below [5]. These areas indicated by the university students and faculty in the social network to share images and allows visitors to zoom in or out by gestures picture to see more details. Appropriate physical control and configuration according to official said the current piece of interactive multimedia wall does not limit the amount and type of data, but the administrator will have to upload media. Kinect with conventional rehabilitation training equipment and low cost compared to great advantage. kinect can use motion capture, skeletal tracking capabilities and depth of field data, accurate information capture limb movement stroke patients were disease diagnosis, treatment for rehabilitation after fracture and brain injury awareness training. Canada now Jintrionix company through Kinect developed remote rehabilitation exercise system. The system is used to help stroke, geriatric and other patients rehabilitation training, it's very broad application prospects.

US home-care services Americare Sinclair School of Nursing and the University of Missouri jointly built the elderly living center field named Tiger (Tiger Place) offers autonomous and independent living environment for old people. Missouri professor of electrical and computer engineering Marjorie Basescu BAK (Marjorie Skubic), said through Kinect, elderly people can obtain more detailed data pace - pace, stride, walking time, people will gradually discovered in the early subtle changes, and then determine whether the elderly in need of medical help.A company in Lausanne,

Switzerland, called MindMaze of the use Kinect to help stroke rehabilitation patients, patients wearing virtual reality glasses situations, follow the prompts to do a series of rehabilitation-style training, these actions by the camera to capture, assess the condition and treatment. When the patient returns home, you can use Kinect to continue treatment in the ward.

Fig. 2 Interactive wall

3. The application of kinect in architecture

The recent release of Microsoft's Kinect controller has generated significant interest with its ability to detect human proximity and motion. Consequently, it was decided that the use of the Kinect would be explored for gesture detection. The designed system is a gesture-based interface that can be used by architects to import 3D architectural models, allowing their clients to navigate through them using the Kinect[6]. Since the September 11 terrorist attacks, the US government uses a considerable number of surveillance cameras to combat and deter crime. Also many countries around the world have invested in funds set up to strengthen the photographic equipment as shown in the figure 1 below[6].. Although these photographic images will help monitor the investigation of the case, but requires considerable human resources one by one to filter the video screen in order to find clues, in fact, a time-consuming and laborious task. Coupled with the video environment issues, such as poor resolution, light affect, noise, etc., making handling difficult. Kinect in this regard focus on is this: how to find redundant and long video screen, to facilitate investigators quickly identify the problem screen; recombinant multiple fuzzy, distant images such person to the face or body characteristics strengthening image of the object search.
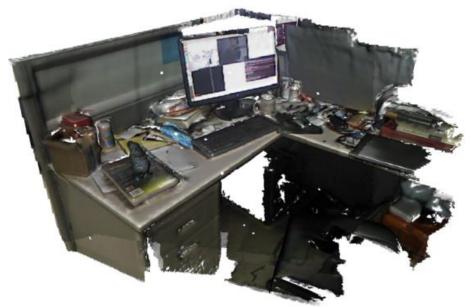

Fig. 3 kinect fusion 3d scan

Due to global warming, the gradual increase in the average temperature around the globe, ocean moisture evaporation exuberant, resulting in abnormal weather around so frequent storms, floods,

landslides and other disasters. Disaster relief command center in order to fully grasp the situation and schedule, you can use a single point or multi-point video conferencing, the disaster relief, emergency relief and other disaster site screen real-time transmission back to the command center to facilitate staff analysis, rapid deployment of resources. In the future, this can also be applied in the ambulance, when necessary, provide support for real-time patient. In the prevention of disasters, but also to shape the use of graphical information with telemetry imaging technology, real-time monitoring of abnormal imaging condition, early detection of an unstable hillside or river, in order to achieve the effect of warning. In addition, the image of intelligent fire detection, early warning fire, flood detection, the preservation of security and other systems, but also the future development of Kinect goals.

Kinect already and people's daily lives are closely integrated, and improve our quality of life, unfortunately, is still some distance away from their intelligence, so the future of humanity and technology combined with Kinect will work together is the goal of everyone.

4. Shortcomings

Since the link between science and technology and the impact, regardless of what we use modern science and technology, so as to deal with before we Landscape design problems that exist, will have a butterfly effect. The development of technology like the evolution of ecosystems, rarely a single technology to promote the growth of existing scientific and technological breakthroughs and new play that led to the invention of the formation of a closely linked network of ecology, science and technology described in this article should be true and the formation of commercial products into the market also need to improve people's lives throughout the relevant science and technology in order to achieve common development.

5. Conclusion

With the development of science and technology, people are now living environment requires more and more diversified. People hope to live in the city in the future, they can always enjoy the beach house, there is a soft sea breeze and bright sunshine. But also feel the night wind in the forest, sleeping, listening to the rain to enjoy their share of unique mood sleep safely. We can stay at home will be able to enjoy the same as the ancients forest idyllic, tree-lined mountains or lifestyle. Regardless of any time, people can enjoy the different seasons at any time regardless of holidays, friends and family can no longer have to worry about whether or not home for the holidays. No matter how far can get together, family and friends can be a day of their time, get together to eat and chat. Here, the holographic mixed reality technology can we see it used in many aspects of life in the future, especially used in landscape architecture, landscape design of the development will be a major breakthrough. From here we can see that the technology has broad prospects for development and great use of space in architecture.

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