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A Study on Creation of Human 3D Replica from 2D Images

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ABSTRACT

In this contemporary world, 3D modeling is dominating the human race than 2D images. There are various methods used for converting 2D to 3D images. After various studies on image processing, conversion of 2D TO 3D image can be done either manually or automatically. This can be efficiently implemented on online shopping applications. In online shopping the users will purchase the dresses after considering the color, design and size. But sometimes the selections may go wrong. Modifications can be done on the existing online shopping system with adding 2D to 3D image conversion technique so that shopping can be done more easily.

Keywords : 3D modeling, 2D Images, Image Processing, Image Conversion Technique.

I. INTRODUCTION

Image processing performs some operations on an image. Two types of image processing are namely, analog and digital image processing. Analog image processing is done on two dimensional analog signals. Actually data is represented in analog or digital format. Analog wave formats are analog images. Digital image processing is done on digital images. It is more efficient than analog image processing since large number of algorithms can be used. 2D images are generally flat that is it has only two dimensions. 3D images have depth in it. Various algorithms are used for conversion of 2D images to 3D model. Conversion of images can be done manually and automatically. The techniques like depth-based conversion, multi-layering, bilateral filtering etc., are manual conversion. Automatic methods are depth from motion, depth from focus, depth from perspective etc., Specified cameras like stereoscopic dual camera, digital camera, depth range camera are also used. A successful conversion of 2D images to 3D model depends on the image given as input, algorithm and the method used. Under certain constraints image conversion is implemented efficiently in various systems like medical field, pattern recognition, video processing, remote sensing and robot vision.

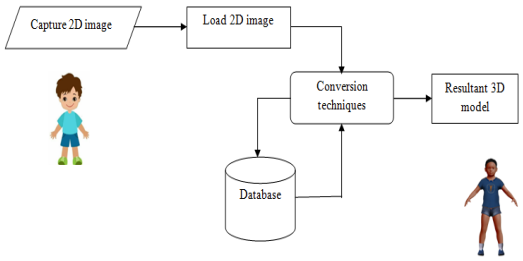

Figure 1. General conversion diagram

II. LITERATURE REVIEW PRESENTATION

Avi Kanchan, Tanya Mathur (2017) have studied a large number of 2D to 3D conversion algorithms to recover the structure or shape of objects in the images. Estimating depth quality and computational

complexity due to the use of SIFT are done in the proposed system.

Dhumal Sadhana, Jagtap Sarika, Jagtap Varsha and Taware Saee (2016) have determined image translation using perspective geometric method. Local point transformation is implemented to convert 2D images into 3D model.

Noel Vincent, Shiny Mathew, Shilu Mathew and Ishtiaq Qadri (2015) have presented an application to perform 3D computerized duplicates of the picture arrangement. Digital camera was used to capture images. Data processing is done in an efficient and simple way by SFM.

Hemali Dholariya, Jayshree Borad, Pooja Shah and Archana Khakhariya (2015) have discussed about various depth estimation techniques like local depth hypothesis, image fusion, support vector machine and MTF squeeze model. Scene grouping, Depth hypothesis generation and Depth assignment and refinement are the steps in local depth hypothesis. The steps to implement image fusion algorithm are capturing 2D image, capture 2D image through left view camera, capture 3D image through right view camera, image fusion and generate the 3D image.

Shweta Patil and Priya Charles (2015) has discussed about 2D to 3D conversion like depth using motion, depth using visual saliency, depth using perspective geometry. Depth using motion is mostly suitable for video conversion. The methods using perspective geometry are more suitable for image conversion than isometric geometry method.

Soniya L. Samgir, Priyanka B. Shelar and Sarika S. Gadade (2015) have developed a web application for converting 2D image into 3D image. A simple algorithm is implemented for the automatic conversion of 2D image into 3D Image where approximate 3D image output is obtained.

Pathur Nisha S and Ilango Krishnamurthi (2015) have discussed about collecting annotation data and to take back the related images from the image position. This system describes about automatic annotation and retrieval tool for image annotation and image retrieval. Integrated Image Retrieval Algorithm is used.

Saravanan Chandran (2014) has discussed about conversion algorithm considering left and right side 2D image of the user. Depth value is taken and image fusion algorithm is used for implementation. Left and the right images is fused using image fusion algorithm.

Arpita M. Limbachiya (2014) have studied that to create depth maps most of the conversion algorithms uses depth cues. The proposed paper is about a general learning about various techniques like Block-based depth from motion estimation, color based region segmentation, fusion, Multi cue fusion, Bilateral Filter, DIBR techniques. A single depth cue is not that efficient in conversion of 2D image to 3D model. Hence combination of depth cues are used and also machine learning techniques can be implemented.

Zeal Ganatra, Riddhi Chavda, Lynette D'mello (2014) have presented a 2D to 3D conversion algorithm which considers estimated depth quality and computational complexity. Kinect camera was used to capture images. This algorithm uses edge information to group the image into rational regions. To find the depth of each region, depth hypothesis is used and to remove the blocky artifacts, cross bilateral filter is used. This proposed algorithm provides 2D-to-3D conversion using 3D applications.

Nisha S. Pathur, V.S. Thangarasu and Krishnamurthi Ilango (2016) have studied about image retrieval algorithm which connects annotation work and retrieval model for geometric images. Automatic annotation of information for larger geometric

shapes is explored. Accuracy is improved compared to multilevel observation hierarchy.

Lee Sang-Hyun, Park Dae-Won, Jeong Je-Pyong and Moon Kyung (2014) have investigated ROI boundary by MTF squeeze function and evaluation of depth level all the way through gradient map. The proposed system uses algorithm which uses outline information in order to group the image into consistent regions. It depends on the block size for quality of the resulting 3D model.

S. Bharathi and A. Vasuki (2012) experimented using an algorithm that uses edge information in order to group the image into logical regions. The proposed algorithm is quality assured as it depends on the block size. Smaller block size the outcome is with better depth detail and if larger block size it is with lower computational complexity.

Madhuri A. Tayal and Animesh R. Tayal (2012) discussed that image depth calculation for 3D image is used in the most of existing systems. The proposed system uses isometric views, simple geometry calculations to make the 3D objects. It is more efficient and effectively produces results compared to image depth calculation method.

Lana Madracevic and Stjepan Sogoric (2010) have studied about the system that creates sensible animation in real-time. Automatic and direct methods of modeling are used in this system. The proposed system used HDR and Tone-mapping methods of processing 2D images.

Mao-Jiun J. Wang and Yueh-Ling Lin (2010) have presented a 3D model using component information from the back and front 2D image of a user. Feature extraction, body shape deformation are used in the construction of 3D model. A body feature extraction algorithm was used to find feature points and to collect body dimensions.

Kitara Kadhim Al-Shayeh and and Muzhir Shaban Al-Ani (2009) have presented an algorithm for 3D idea through the extraction of the 3D from 2D image. It is applied on medical field since it supports different image formats. Low resolution, high level of noise, low contrast and geometric deformations are the major issues considered in this proposed system.

Xiaojing Zhou and Zhengxu Zhao (2008) presented a new method to construct 3D virtual human models by applying 2D orthogonal images and consecutive video images with closed-fitting frocks and trousers. The system might not correctly identify the body parts that are with limitation like woman with skirt, man with jerkin.

Philippe Lavoie et al (2007) discussed to reconstruct the 3D image of a real object with a desired high accuracy. One digital camera and a projector are used for image capturing. It uniquely locates and orients a point on any type of object surfaces especially the flat and texture-less ones.

III. ANALYSIS ON THE LITERATURE FINDINGS

This review presents overview of conversion of 2D images into 3D model using various techniques which created a challenging environmental in field of image processing. A large number of 2D to 3D conversion algorithms has been implemented. It also shows a skeleton matching process for simulating 3D motion of human body. The model construction system works well for front and side view algorithms check for the estimated depth quality and computational complexity. Capturing of images is done using specified cameras like Kinect camera, digital camera etc. The simple depth hypothesis method is used to find the depth of each region and cross bilateral filter method is used to remove the blocky artifacts. Automatic conversion of 2D images to 3D model is now used extensively for better results and performance. The results were

encouraging to find that different methods, which would result in best 2D images to 3D model conversion under some constraints.

HDR and Tone-mapping methods, ROI boundary by MTF squeeze function method utilizes outline information in order to group the image into coherent regions. Some of the latest research papers addressed the use of perspective geometric method and isometric views to improve the conversion techniques. Most reports in recent past also shows improved body feature extraction algorithm to advance the progress on obtaining the feature points and collect body dimensions. Various features like position in which 2D image has to be captured, camera which has to used, size and quality of the image, the outfit that suits to measure physical dimensions like shoulder size, hands and leg length and techniques used for conversion determines the 3D model as the result

IV. CONCLUSION

The major research possibilities in this particular area are a bit challenging and tricky since the requirements for the creation of 3D model and conditions for creation with respect to realities and constraints. To conclude is by finding a way to create a 3D model from 2D images in an efficient way instead of using conversion techniques; open source software can be used. Most recent researches have to be considered and also need to look upon alternatives to create a successful model and to control issues.

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