###### Logo Black and White

PUCIT

Punjab University College of Information Technology

**Final Project Proposal**

**Version 1.0**

**.**

Table of Contents

[Final Project Proposal 2](#_Toc105323786)

1. [Project Title 3](#_Toc105323788)
2. [INTRODUCTION 3](#_Toc105323791)

3. [Project Overview Statement 4](#_Toc105323789)

4. [Project Goals & Objectives 5](#_Toc105323790)

5. [Gantt chart 5](#_Toc105323795)

6. [Hardware and Software Specification 6](#_Toc105323796)

7. [Tools and technologies used with reasoning 6](#_Toc105323797)

# 

# Final Project Proposal

## 

## 1. Project Title

Depth Image Based Rendering (DIBR) Library

## 2. Introduction

Depth perception in human visual system is a complex process. Due to interpupillary distance (IPD, left and right eyes receive two slightly different images of the 3D scene which results in positional differences of the objects. These positional differences (usually in horizontal direction), referred to as **binocular disparities**, are processed in the visual cortex of the brain to yield depth perception. This phenomenon can be simulated artificially by presenting the eyes two images of a 3D scene captured at slightly different viewpoints and it is called stereoscopy. Today, many electronic companies are manufacturing 3D-TVs and are aiming to produce high quality 3D televisions at affordable prices.

“Autostereoscopy” is the 3D display technology that does not require the viewer to wear any special eyeglasses to visualize the 3D display. It is very sensitive to the position of the viewer. To enjoy the 3D experience the viewer must be in a predefined area in front of the display. The autostereoscopy lacks the horizontal parallax that is when the viewer moves horizontally while viewing the display, he will see the same 3D scene which is quite unnatural.

“Multiview autostereoscopy” provides horizontal parallax by rendering more than 2 views, up to 50 views or more. As a result when the viewer roams around the display he experiences a new set of views in each viewing zone giving him a natural 3D experience. Although no stereoscopy based 3D display provides vertical parallax. That is, the viewer cannot move up or down to see the 3D scene from different vertical angles. Moreover, the multiview autostereoscopic displays provide a limited horizontal parallax around 20-30 degrees, which is still far from real 3D experience.

There are many other technologies introduced like Integral Imaging, Holography and Volumetric Displays, those are relatively costly and have backward compatibility issues although they still being use but the stereoscopy and multiview autostereoscopy have established as the favorite 3D technologies due to low cost , ease of data acquisition and backward compatibility.

To enable multiview autostereoscopy and to provide a reasonable horizontal parallax, a huge number of views must be presented at the receiver side for this a technique called Depth Image Based Rendering is introduced. However, capturing, coding and transmitting such a large number of views are not practical due to various cost, hardware, and bandwidth constraints. Therefore, few camera views are captured and transmitted whereas a large number of views are synthesized in real time on the receiver side.

Depth Image Based Rendering is the view synthesis technique that exploits the depth maps to warp the available views to virtual viewpoints to generate a novel view of the 3D scene.

## 3. Project Overview Statement

The main purpose is to create a library in which different Depth Image Based Rendering algorithms will be put together for the user’s convenience. This library will contain the number of efficient codes. The codes will be evaluated on the basis of efficiency, and after a proper analysis of algorithms.

|  |
| --- |
| Project Title: Depth Image Based Rendering (DIBR) Library |
| Group Leader:Syed Saqib Rafi Hasanie |
| Project Members: 3   |  |  |  |  | | --- | --- | --- | --- | | Name | Roll Number | EEmaill Address | Signature | | BITF16M510 | SYED SAQIB RAFI HASANIE | bitf16m510@pucit.edu.pk |  | | BITF16M537 | ARSLAN AHMAD | bitf16m537@pucit.edu.pk |  | | BITF16M548 | UMAIMA ZULFIQAR | bitf16m548@pucit.edu.pk |  | |
| Project Goal:  The main goal of our project is to create a library which contains different DIBR algorithms. |
| Objectives:   |  |  | | --- | --- | | Sr.# |  | | 1 | To promote usability | | 2 | To use statistical measures | | 3 | Time comparison | | 4 | Analysis of algorithms (performance analysis) | |
| Project Success criteria:  Completion of project in specified time period. |
| Assumptions, Risks and Obstacles:   * Access of Internet is the basic risk. |
| Organization Address (if any):  Punjab University College of Information Technology, Lahore |
| Type of project: 📺Research📺Development |
| Target End users: |
| Development Technology: 📺Object Oriented 📺Structured |
| Platform:📺Web based 📺Distributed  📺Desktop based 📺Setup Configurations  📺Other\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| Suggested Project Supervisor: Dr. Shahid Farid. |
| Approved By: |
| Date:27 Oct, 2019 |

## 

## 4. Project Goals & Objectives

The main goal of our project is to create a library which contains different DIBR algorithms.

Objectives of this project are:

* To promote usability.
* To use Statistical measures.
* Time comparison.
* Analysis of algorithms (performance analysis).

**5. Gantt chart**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ID | Task Name | Duration | Starting Date  mm/dd/yy | Finish Date  mm/dd/yy | |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | Sep 2019 | Oct 2019 | Nov 2019 | Dec 2019 | Jan  2019 | Feb  2019 | Mar 2019 | Apr 2019 | May 2019 | June 2019 | | MTWTF | MTWTF | MTWTF | MTWTF | MTWTF | MTWTF | MTWTF | MTWTF | MTWTF | MTWTF | |
| 1. | Domain knowledge | 18 days | 9/30/19 | 10/18/19 |  |
| 2. | Data acquisition and understanding | 21 days | 10/19/19 | 11/10/19 |  |
| 3. | View generation | 40 days | 11/11/19 | 12/31/19 |  |
| 4. | Standard DIBR implementation | 31 days | 1/2/20 | 2/2/20 |  |
| 5. | Literature study | 24 days | 2/5/20 | 3/1/20 |  |
| 6. | Wrtie code | 52 days | 3/2//20 | 4/24/20 |  |
| 7. | Complete testing | 10 days | 4/25//20 | 5/10/20 |  |
| 8. | Fix issues | 6 days | 5/11/20 | 5/17/20 |  |
| 9. | Performance  comparison | 13 days | 5/18//20 | 5/31/20 |  |
| 10. | Report writing | 14 days | 6/1//20 | 6/14/20 |  |

## 6. Hardware and Software Specification

* **Hardware**
* Processor: Intel(R) Core(TM) i3-5100U CPU @ 2.40 GHz
* RAM: 8GB
* System: 64-bit Operating System, x64-based processor
* **Software**
* MATLAB 2017b

## 7. Tools and technologies used with reasoning

* “MATLAB” is our important tool which we will use to develop our project. The reasons for this tool are:
  + MATLAB is a mature and rich integrated development environment (IDE).
  + It focuses on work more than syntax.
* The Programming Languages which we will use to develop our desired project are following:
  + MATLAB
  + C

We will use these languages because these languages will provide the best implementation of algorithms.