Título

Kinectulum

3D Object reconstruction using Kinect and mirrors

3D Object reconstruction using a single Kinect and mirrors

3D Image Acquisition using a Static Setup

3D Information Acquisition of Small Daily Objects

3D Full Data Acquisition a Static Setup

3D Panoramic Data Acquisition using a Static Setup

Head

Thanks

Things

Abstract

Things

What did you do?

Why did you do it? What question were you trying to answer?

How did you do it? State methods.

What did you learn? State major results.

Why does it matter? Point out at least one significant implication.

Resumo

Introduction

Description of the problem here.

The acquisition of 3D information is classically a difficult and slow process. The usage of RGB cameras alone is not efficient neither precise once we only have the image in 2D and the extraction of 3D information has to be calculated through computer vision algorithms. With the addiction of other material such as projectors and with the application of technics as structured light, the acquisition has become more precise but it requires more time.

3D acquisition systems as structured light have high costs.

With the introduction of depth cameras such as the Kinect, the acquisition of the 3D information became easier and in real time. Nevertheless, the acquisition does not have an high level of detail due to the cameras’ resolution but if we combine the raw image information with computer vision algorithms for image treating and 3D reconstruction, we can achieve good results in terms of quality and time.

The idea is to take advantage of the potential of the Kinect and use as much information as we can. Typically, when aiming at an object with a camera, we center this object and there is much space of the image that doesn’t have useful information. If we could use this space to acquire information about this object, we would be maximizing the resources and as so, we can achieve better results in less time.

We live in a world more and more digital where the interaction between humans and technology and more specifically, computers, is more and more common.

The interaction between humans and technology and, more specifically, computers, is more and more frequent.

Motivation

Objectives

Document Organization

Related Work

3D Scanning / Images Acquisition

Things

Stereoscopy

Things

Time-Of-Flight

See Book Time-of-Flight Cameras and Microsoft Kinect

Things

Structured Light

Things

Kinect

Things

Panoramic Data Acquisition Systems

Things

Moving

Things

Static

Things

­­­­­­­Summary

Things

Concept Design (?)

Re-explain the problem and show some example of what it would be nice to do with it.

Show the proposed system (architecture).

For each part of the system explain the reason of that choice. Why to use the Kinect, Why to use mirrors (cheap and static system, no moving around with the camera)

Development

Used Technologies: OpenNI, OpenCV, RGBDemo, (C++)

Kinect for windows Near Mode –

http://blogs.msdn.com/b/kinectforwindows/archive/2012/01/20/near-mode-what-it-is-and-isn-t.aspx

System pipeline.

If necessary, show some specific parts of the code or implemented algorithms.

Smoothing (where?)

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Results

Coisas

Conclusion and Future Work

Conclusions

Future Work

Use of Leap Motion – Show the advantages of Leap and a possible integration with a RGB camera to complement depth and rgb image.

Appendix

User Guide

Related Work

3D Scanning / Images Aquisition

Things

Technology (Instruments)

Describe each technology and point the pros and cons.

Structured Light

Stratified light?

Depth Cameras (emphasis on Kinect)

Ranging Cameras

Triangulation Scanners

**Mesa Imaging SwissRanger 4000 (SR4000)**

<http://www.acroname.com/robotics/parts/R317-SR4000-CW.html>

**PMD Technologies CamCube 2.0**

http://www.geometh.ethz.ch/people/kohtobia/DGPF2011

<http://openni-discussions.979934.n3.nabble.com/OpenNI-dev-Minimum-Depth-td4015339.html>

**PMD Nano**

http://www.pmdtec.com/html/pdf/order\_CamBoard\_nano.pdf

**Bumblebee 2 e XB3 specs**

http://uprt.vscht.cz/kubicekm/Novinky%20ze%20sv%C4%9Bta/Stereo\_Vision\_Introduction\_and\_Applications.pdf

**Bumblebee 2**

http://3dvision-blog.com/forum/viewtopic.php?f=23&t=2655

**Bumblebee XB3**

http://www.ece.gatech.edu/academic/courses/ece4007/11fall/ECE4007GTS/sv1/documents/ASEDProposal.pdf

**Kinect**

**Primesence**

**Other Cameras**

http://en.wikipedia.org/wiki/Time-of-flight\_camera#Brands

Systems

Show some examples of working systems. Point the technologies that they use, their characteristics and for what purposes where they developed and explain how they are used (static or moving camera, p.e.)

From Capture to Models

Mesh construction from point clouds.

Smoothing

Color issue.

Normal, reflection, etc.

­­­­­­­Summary

Things