Snaml 3D Carousel

1. Overview

Today most of 3D viewers are only displayed one 3D object model on a Window. To explore 3D Printing objects better, Snaml 3D Carousel was designed as a 3D organizer, navigator, and viewer that can display a group of 3D objects in a circular carousel. As a productivitity tool of 3D Printing, Snaml 3D Carousel allows you to select a large amount of models instantly for preview before real printing.



You can rotate the central 3D object to watch its surface in details. By using go left and go right function, you can rotate the carousel in clockwise or counter-clockwise direction, then every 3D object can be the central object from a chain of objects.

You can also apply add, delete, and exchange commands to manage a carousel over its chains and objects. Moreover, you can save current carousel as a file and open it later as a new carousel. You may print current 3D object or share a carousel with others. You can control Snaml 3D Carousel in mouse, keyboad, touch, gesture, and voice.

There are many application cases of Snaml 3D Carousel. For example, user can watch a group of 3D objects as a showcase then select objects for 3D printing. Users can also share carousels with other peoples. In advance, you can control infotainment system of a car by voice commonds through Snaml 3D Carousel.

2. Mechanics

Snaml 3D Carousel is a 2D Organizer, a 4-Way Navigator, and a 3D Viewer for a group of 3D models organized in a Cross Circular Carousel.

A Carousel is defined as a set of Chains which include a set of Objects. A chain of 3D models are located around a circle like satellites. The 3D model in front center is the current focus object. Layered chains are linked as a new chain and entire set is called two dimensional circular 3D carousel, or simply carousel.



Objects in current chain of carousel is displayed in circular on screen. The chain can be rotated in counter-clockwise or clockwise direction.

2.1. As a RealSense Gesture App

when you raise a hand in big-5 inside the visible range of RealSense camera, Snaml 3D Carousel will start to rotate. Move cursor to left half screen, carousel will rotate in clockwise direction; move cursor to right half screen, carousel will rotate in counter-clockwise direction. You can move hand to change direction. While you move hand to be invisible by RealSense camera, the rotation of carousel will be stopped.

When you push hand forward (use tap gesture), the rotation of carousel will be paused. You can move hand to make current object in motion. Pushing hand again you come back to rotation. By using tap gesture, you can select focused object.

You can zoom in or out the current chain by using all-fingerclose gesture. You may move hand in finger-close gesture forward or backward to zoom in/out.

2.2. As a RealSense Voice App

you can apply voice commands to do more Snaml 3D Carousel operations such as 'full screen' toggle, 'go up' shift

to a new chain, 'swap left' to swap left and current object.

2.3 As a Mouse & Keyboard App

you can drag and move to rotate the current 3D object to view entrie surface of the object. By using up or down keys, you can shift another chain of 3D objects as current chain. By using left or right key, you can shift left or right object as current object.

Snaml 3D Carousel can store several chains of objects. That is the storage capacity is in the degree of n^2. i.e. it can work with 100x100 =10,000 objects in well organized. Snaml 3D Carousel is target to solved the problem of large amount of 3D model management as well.

3. Tools and Technologies

3.1 Tools

- RealSense SDK 2014 Gold
- Visual Studio 2013 Community Edition C++
- DirectX SDK June 2010

- SQLite Embedded Database
- Snaml Carousel Engine



Secondly Snaml Carousel Engine invented by Neatware along with SQLite database was integrated for cross carousel operations.

Finally RealSense SDK was supported to handle gestures and data of 3D camera as well voice commands. Two new threads were created to capture 3D camera frames, events and voice message. The multi-thread architecture took the advantages of multi-core processors for high performance. Optimized implementation made reasonable speed for good user experience and fast response.

3.2 Advanced

3.2.1 Clone

Snaml 3D Carousel is an effective tool to view and compare a clone of 3D objects. i.e. 3D objects in different colors or texture mappings.

3.2.2 Continuum

Snaml 3D Carousel was designed to work on a resizable Window. It can work on smartphone, laptop, workstation, and HDTV with single app, and it can adjust display layout

automatically. The gesture control of RealSense is good at applications with large screens such as interactive digital signage.

3.2.3 Multi-tasking

Snaml 3D Carousel is a multi-tasking and multi-thread app. You can launch multiple apps simultaneously. It supports 64bit and 32-bit Intel x86 platform.



3.2.4 3D Printing

3D Printing and Scanning was left to implement later when 3D printing SDK is available.

4. Specification

Snaml 3D Carousel is a 3D Model Organizer, Navigator, and Viewer that shows a chain of 3D objects in a Circular Carousel while multiple chains are linked in a new chain. A Window with a menu bar is created to display current chain of 3D objects. There are File, Carouse, and Help menu items with sub-items.

4.1. File

Open Carousel will open a .sm3c Snaml Carousel file that contains a set of 3D model references. **Save Carousel** will save current Snaml Carousel in-memory to current opened file. **SaveAs Carousel** will save current Snaml Carousel inmemory to a file with the name from dialog box. **Print 3D Model** is going to print current 3D object on a 3D printer. **Share Carousel** will share current Snaml Carousel file with others online. **Exit** will quit current program from execution.

4.2. Carousel

New object is picked up from a sub-directory with .x and its texture files inside by opening a dialog box.

Add to Previous Chain will add a new chain in previous position contrast to current chain by inserting the first object. New chain is moved as current chain to display on screen. Add to Next Chain will add a new chain in next position contrast to current chain by inserting the first object. New chain is moved as current chain to display on screen. Add to Previous Object will add a new object in left position of current object. Add to Next Object will add a new object in right position of current object. Delete Object will delete current object from current chain.

Exchange Previous Chain will exchange position between current chain and previous chain. Exchange Next Chain will exchange position between current chain and next chain. Exchange Previous Object will exchange position between current object and previous (left) object. Exchange Next Object will exchange position between current object and next (right) object.

4.3. Help

About is a short control description. You can use Gesture, Mouse, Keyboard, and Touch to control Snaml 3D Carousel.

4.4. Gesture

Current Object Rotation: hand tap gesture push and move

Object Rotation: hand move between half screen to change rotation direction

Zoom: pinch gesture to zoom in or out current chain

4.5. Mouse

Current Object Rotation: press left mouse button down & move

Zoom: scroll mouse wheel to zoom in or out

4.6. Keyboard

Object Rotation: press left arrow key to rotate in clockwise direction press right arrow key to rotate in counter-clockwise direction

Chain Rotation: press up arrow key to move next chain to current. press down arrow key to move previous chain to current

Zoom: press ctrl+left arrow key to zoom in. press ctrl+right arrow key to zoom out

4.7. Touch

Current Object Rotation: tap one finger on screen and move

Zoom: two fingers pinch to zoom in or out

4.8. Voice

Chain Rotation: voice 'turn left' and 'turn right' command shift objects in clockwise and counter-clockwise direction.

Chain Shift: voice 'go up' and 'go down' command shift chain in next and previous.

Object Swap: voice 'swap left' and 'swap right' swap position between left object and current object, right object and current object.

System Operations: voice 'full screen' command toggle display mode to fullscreen.

4.9. Others

Full Screen Toggle Button allows you to click this button to toggle true full screen state. **F1 Key** is a key to simply show/hide short description of controls.

5. Requirements 5.1 General Edition

For almost any modern Windows PC. As Windows 7, 8, 10.

5.2 RealSense Edition

RealSense Camera Kit, Windows 8.1, Intel 4th Gen Core Processor Core i7, USB 3.0

The RealSense SDK 2014 has been used to implement the prototype of Snaml 3D Carousel. Swipe around in front of RealSense Carmer, Snaml 3D Carousel can be rotated in counter-clockwise or clockwise directions. More RealSense gestures will be applied for other natural operations. The 3D Capture and Print functions of RealSense can also be added into Snaml 3D Carousel.

6. Setup File

It creates Snaml 3D Carousel installation.

7. Video Demostration

Use with RealSense URL: http://youtu.be/m5V5J4IB0GM