Wesley Folz
Ryan Hoefferle
02/09/2015
ECE473

Team Trekker

Project Requirements

Images to 3D Models (Our proposed app)

Our proposed app would create a digital 3D model of an object from multiple photos of an object captured by the camera on a smartphone. This 3D model would be a collection of vertices, edges and potentially faces. The model of the object could then be exported into a standard graphics file such as a ".obj" or ".stl" file. Optionally, the app could display the 3D model that was created and allow the user to move it around and view it from different angles. Our app would start out simple by attempting its function on something like Lego blocks and if successful attempt the 3D capture of more complex shapes.

Function Requirements				
Req #	TSS = The Software Shall	Difficulty 1/E - 5/H	Prerequisite Requirements	List
1.1	TSS will allow the user to take pictures with the smartphone camera.	1	n/a	B
1.2	TSS save multiple images as internal data structures.	1	n/a	B
1.3	TSS automatically differentiate a user selected object in an image from the background of that image.	2	1.2	A
1.4	TSS automatically detect outer edges of a user selected object.	2	1.2	A
1.5	TSS match similar features from multiple images taken of the same object from different angles.	3	1.1, 1.2	B
1.6	TSS convert images into a collection of vertices with xyz coordinates.	3	1.5	B
1.7	TSS combine vertices into triangulated faces.	2	1.6	B
1.8	TSS save output to the sd card on the device.	1	1.7	B
1.9	TSS share output files with other devices (e.g. email, cloud storage, etc.)	1	n/a	A

1.10	TSS allow users to rotate and view 3D models from different angles.	3	1.11	A
1.11	On shutdown of device or app, TSS compress current object files.	2	n/a	A

Non-Functional Requirements				
Req #	TSS = The Software Shall	Difficulty 1/E - 5/H	Prerequisite Requirements	List
2.1	TSS be compatible with Andoird API 14 (Ice Cream Sandwich) to ensure compatibility with at least 85% of Android devices.	1	n/a	B
2.2	TSS require the capture of 2 or more images of an object from different angles before 3D conversion.	1	1.1	B
2.3	TSS output and save .obj files to the sd card.	2	1.7	B
2.4	TSS output and save .stl files to the sd card.	3	1.7	A
2.5	TSS import .obj files and render them as 3D models.	4	n/a	A
2.6	TSS will give dimensional ratios (height, width, and length) within an accuracy of a 10% POE (percent of Error)	2	n/a	B