3D Image Reconstruction UML Diagrams

Activity Diagram – Image Processing

Sufficient Matches

Image Clusters

Depth by Structure from Motion

SIFT Image Matching

Input Images

Corresponding Points

Clustering

Depth Maps

Unlinked Images

Depth by Linear Perspective

Insufficient Matches

Rejoin Depth Maps

Model Presentation

Render Model

Unified Depth Map

Architecture – Pipeline Processing with Model-View-Controller for User Interface

Inserts Additional Images

View Updates

View Updates

User Input

User Input Edits Model

Controller request Model state data

Reconnect Depth Maps

Linear Perspective

SFM

Clustering

Image Matching

View

Controller

Model

Class Diagram

1

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1

1

1

1

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1

image

src: String

dimensions: int[2]

neighbors: image[]

pointMatch: int[3]

Cluster

Members: image[]

Neighbors: cluster[]

Insert()

Remove()

Cursor

Position: int[2]

Lmb: bool

Rmb: bool

Mmb: bool

checkStatus()

Physical

position: int[3]

collision: bool

update()

collideCheck()

render()

Engine

originPt: int[3]

camera: int[5]

objList: Model[]

lightList: Light[]

pointer: cursor

update()

Light

Intensity: int

Color: int[3]

Model

depthMap:

State Machine Diagram

Numpad/Arrows Held

Numpad/Arrows

Mouse Held

Shift Camera

Move Camera based on inputs

Mouse Drag on Model

Rotate

Change Model Orientation

While Active

Annotate CMD

Annotate

Insert Text/Lines inserted by user

ImageList is not empty

NumImages = 0

FileNotFound UnrecognizedFile

Insert Images CMD

Save CMD

Save Model

Encode and Save Model to Memory

FileError

Display Error

ProcessError

Display Error

Model Loaded

Show Model Space, Model and UI Elements

Processing

Process Images

Load Image

Load Image From Source

New Model

Prompt For Images

Load Model

Load Model From Saved File

Start-Up

Show Blank Model-Space and UI Elements

State Diagram – Processing

Depth Maps Cannot be Reconnected

Error

Model Loaded

Clustered Images

Unclustered Image

No Known Clusters

Clusters Known

Linear Perspective

Create Depth Map for Unclustered Image

Image Matching

Find Corresponding points in images

Rendering

Render Model based on Connected Depth Map

Load Images From Model loaded

Clustering

Cluster new Images into existing objects

Load Images from New Model

Reconnect

Merge Depth Maps Based on Corresponding Points

SFM

Create Depth Map For Cluster

Clustering

Cluster Images into objects

Processing