Category Specific Object Reconstruction from a Single Image

Team ID - 6
Team Name - The Fast and The Curious

Pose Annotation Tool:

The algorithm needs annotated data and we are using the following to annotate the instances in the data set and set model viewpoint using Anchor Points

Using the pose annotation tool:

- Load CAD model - The CAD models define the geometry of the object category. There are multiple CAD models for one category in order to capture the intra-class variability.
- Open the directory containing the images to be annotated
- Open the directory containing the bounding box annotation of the objects to be annotated
- Choose one CAD model and align coarse viewpoint
- Annotate the anchor points
- Save the annotation

Anchor Points:

From the CAD model, we want to find the closest model to the image instance. After selecting that model, we look for some 'special points' (specified in the CAD model, which represent the shape and pose of the model) caller Anchor Points.

We match these points to the image with the bounding box. These points can be visible or truncated or occluded etc., therefore we need many Anchor Points to get the annotation.

Table 1. Statuses of an anchor point.

Status	Explanation	Action
Visible	The anchor point is visible from the coarse viewpoint.	Annotate the anchor point in the image by using the button "Label Anchor Point".
Self-occluded	The anchor point is occluded due to self-occlusion of the object.	Click the radio button "Self-occluded".
Occluded-by	The anchor point is occluded by other objects. For example, a portion of a car is occluded by a tree.	Click the radio button "Occluded-by".
Truncated	The anchor point is outside the image border.	Click the radio button "Truncated".
Unknown	The anchor point does not belong to any of the above statuses.	Click the radio button "Unknown".

The following are a few screenshots while using the annotation tool for a few classes in the dataset - PASCAL 3D+.

anchor_annotator

20   2.5

Next CAD

Prev CAD

Left

Right

Up

Down

OK

Load CAD Model

Open Img Dir

Open Anno Dir

Next

Prev

0.1
0.05
0
-0.05
-0.1
-0.3 -0.2 -0.1 0 0.1 0.2 0.3   -0.2 -0.1 0 0.1 0.2

Next Ten Img

/Users/GowriL/Desktop/3-2/CV/CV_project/code/Ca
tegoryShapes-master/data/PASCAL3D+_release1.0/
Images/aeroplane_pascal

/Users/GowriL/Desktop/3-2/CV/CV_project/code/Ca
tegoryShapes-master/data/PASCAL3D+_release1.0/
Annotations/aeroplane_pascal

291.3805   147.7091

Clear Anchor Point

Label Anchor Point

rudder_upper

Anchor status
- ● Visible
- ○ Self-occluded
- ○ Occluded-by
- ○ Truncated
- ○ Unknown

Next Anchor

Prev Anchor

Save Annotation

Compute Viewpoint

Nov 18, 2006 10:55

number of anchor less than 2

Annotation saved, total 2

HOME   PLOTS   APPS   EDITOR   PUBLISH   VIEW

Search Documentation   Gowri

New Open Save   Find Files   Compare   Print   Go To   Find   Comment Indent   Breakpoints   Run Run Section

FILE   NAVIGATE   EDIT   BREAKPOINTS

/ ▶ Users ▶ GowriL ▶ Desktop ▶ 3-2 ▶ CV ▶ CV_project ▶

Current Folder
Name
- anchor_annotator.fig
- anchor_annotator.m
- project_3d.m
- show_annotation_pasc...
- show_cad_overlay.m
- user_manual.pdf

Editor – /Users/GowriL/Desktop/3-2/CV/CV_pro...
startup.m

```
9  -     currDir = pwd;
10 -     BASE_DIR = [currDir '/'];
11 -     cachedir   = fullfile(currDir,'cache'
12 -     datadir    = fullfile(currDir,'data')
13 -     PASCAL_DIR = fullfile(currDir,'data'
14 -     PASCAL3Ddir = fullfile(currDir,'data
15
16 -     folders = {'main','sirfsPrior/','nrs
17           'visualize/','basisShapes/','uti
18 - ⊟ for i=1:length(folders)
19 -         addpath(genpath(folders{i}));
20 -   end
21 -   mkdirOptional(cachedir);
22 -   clear i;
23 -   clear currDir;
```

Command Window
>>

Details

anchor_annotator

0   0

Next CAD

Prev CAD

Left

Right

Up

Down

OK

Load CAD Model

Open Img Dir

Open Anno Dir

Next

Prev

Next Ten Img

/Users/GowriL/Desktop/3-2/CV/CV_project/code/Ca
tegoryShapes-master/data/PASCAL3D+_release1.0/
Images/tvmonitor_pascal

/Users/GowriL/Desktop/3-2/CV/CV_project/code/Ca
tegoryShapes-master/data/PASCAL3D+_release1.0/
Annotations/tvmonitor_pascal

408.4681   304.1001

Clear Anchor Point

Label Anchor Point

front_bottom_right

Anchor status
- ● Visible
- ○ Self-occluded
- ○ Occluded-by
- ○ Truncated
- ○ Unknown

Next Anchor

Prev Anchor

Save Annotation

Compute Viewpoint

2008_000309.jpg(373, 500)