**Documentation for 3-D deformable-model-based Localization and Recognition of road vehicles**

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 1. **HOG**

compute best two directions o1 and o2

2. **pose**

compute bounding box and its X,Y **(still not finished)**

compute seita using **HOG** which provide o1 and o2

compute projection matrix with X,Y,seita and therefore compute model dots in MCS&WCS coordinate systems

3. **model**

using generated 12 parameters, it forms a 3-D vehicle model within range

4.**draw\_model\_new**

using **model**, compute the coordinate axis's of every dot of the vehicle model within MCS.

And draw the 3-D model so it is visualized.

5. **fitness**

calculate FES which will be used in **EMNA\_for\_deformable\_models.**

6. **EMNA\_for\_deformable\_models**

generate many generations of vehicle models using **model**, and use **fitness** to get FES of each individual of each generation, find the best individual with optimum 12 parameters that fit the vehicle in bounding box best.

7. **judge**

using **sedan, suv**, and **hatchback**, by comparison, find which type the vehicle is.

8. **sedan**

sedan model. With vehicle model as input, calculate the difference between sedan and itself.

9.**suv**

suv model. With vehicle model as input, calculate the difference between suv and itself.

10. **hatchback**

hatchback model. With vehicle model as input, calculate the difference between hatchback and itself.