Puzzle Game

Computer Graphics(CS10101001) Project

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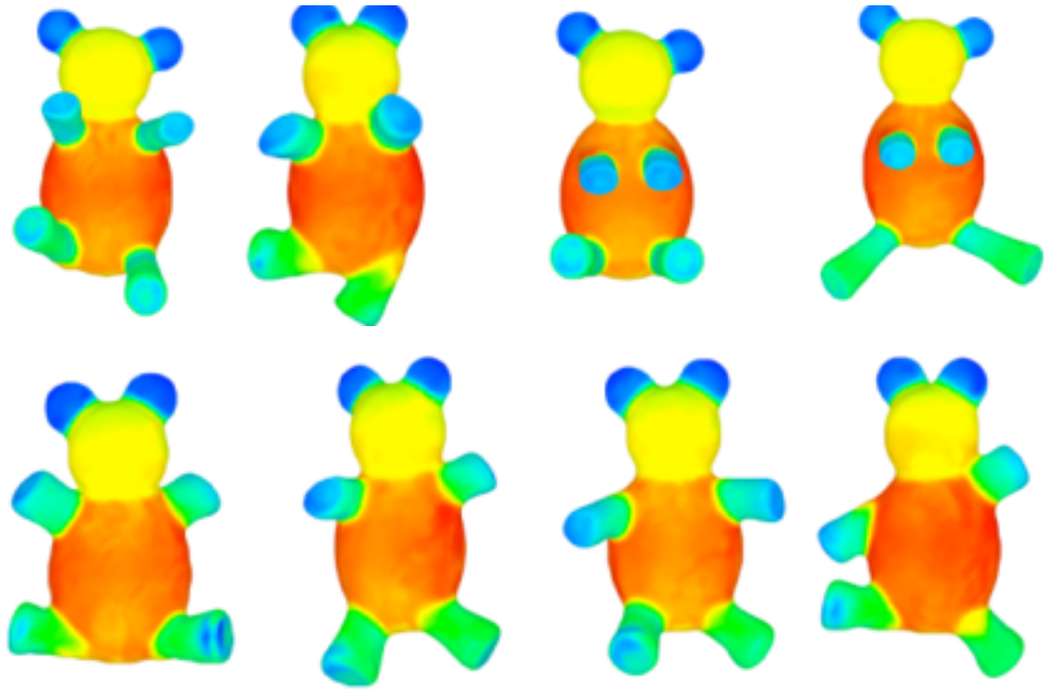
Operation

- Camera Movement
  - Translate using WASD
    - Maintain camera position, target and up direction
- Object Dragment
  - Translate like camera
  - Rotate by Arcball

Model Segmentation

- SDF(Shape Diameter Function)



Model Segmentation

- Post Processing of SDF
  - Assign proper value to facets with no SDF
  - Smoothing (Lowpass Filtering)

Model Segmentation

- Soft Clustering
  - Gaussian mixture model
  - K means and Expectation Maximization

Model Segmentation

- Hard Clustering

$$E(\bar{x}) = \sum_{f \in F} e_1(f, x_f) + \lambda \sum_{\{f,g\} \in N} e_2(x_f, x_g)$$

$$e_1(f, x_f) = -log(max(P(f|x_f), \epsilon))$$

$$e_2(x_f, x_g) = \left\{ \begin{array}{rl} -log(\theta(f, g)/\pi) & x_f \neq x_g \\ 0 & x_f = x_g \end{array} \right\}$$

Combination Judge

- Difference of origin centers of two pieces
- Difference of current centers of two pieces
- Threshold in length and angle of second level difference
- Threshold in difference of rotations of two pieces