Advanced Computer Graphics Summative Assignment - LLLL76

QUESTION ONE

An appearance based metric is centred around using the perceivable difference between two corresponding raster images that are produced by the renderer. The difference can be calculated as the average sum of squared differences between all corresponding pixels, using the euclidean distance between two RGB vectors as representation of the distance between two pixel values. There are more complex methods of difference calculation between two vectors but this works well in this domain. If the difference between the vectors is small then the model is a good representation of appearance in this specific view, a total can be given as the integral over a finite set of viewpoints. The benefits of this method is that similarity of appearance is directly measured and occluded details can be removed without introduction of any error. The problems are that sufficient sampling of the possible viewpoints needs to be done so as to avoid removing perceptually important features, which leads to expensive rendering step sometimes being required, only a reduced number of samples can be taken.

A geometric based metric is based around producing a geometrically faithful representation of the data using techniques derived from function approximation. This does not allow for removal of features that are occluded as this is not known, which leads to an increased number of points being fitted to, however many viewpoints are not calculated as all features are represented.

The appearance based metric should be calculated after a model is displayed, this is towards the end of the pipeline. The geometric based metric should be done after the rendering but before the model is displayed.

QUESTION TWO

QUESTION THREE

QUESTION FOUR

QUESTION FIVE

QUESTION SIX