Abstract

Augmented Realiy (AR) is derivative of Computer Vision so computer can make a virtual object and combine it in real environment using the camera, Head Mounted Display, etc in real time. These days AR need a help tool which is a marker so it can reder the virtual object. The needed marker is a pattern that is known in a system, but the marker isn't natural thing such as face.

In this Final Project study will be developing a system that can catch a movement of natural thing (markerless tracking) which is a face using Particle Filter algorithm, and then make it as a marker in AR. Particle Filter is a objet tracking algorithm that uses the color probability of object as a basis for tracking the object, which is using Hue, Saturation, Value (HSV). Whereas for rendering the virtual object in AR, OpenGL will be used as a basis library.

The test result show the lighting and the number of particle don't have major effect in processing time and tracking performance which using HSV, can differentiate in occlusion and interferention, and object tracking with Particle Filter can be used as a marker in AR with best average error of misplacement x coordinate 4.9863821% and y coordinate 4.287307314%.

Keywords: ***Augmented Reality, Face Tracking, Particle Filter,* OpenGL,**

Markerless Tracking