

## Abstract

Head tracking is a head movement tracking and detecting process by computerized based system using video input which is used to support other needs in each kind of applications. For example in supporting an application of computer vision, intelligence vehicle, multimedia and others. Because of many applications which needs head tracking implementation in supporting their main main functions, it was emerging some problem, such as how to implement a good head tracking process.

In this final project, the method used to implement head tracking is Active Appearance Model (AAM) combining Simultaneous Inverse Compositional (SIC) as a fitting algorithm. AAM will build deformable model which can change, fit and estimate input image (video frames) pose using fitting process. That model is built by using training process from a set of training images which is resulting two representative model, called shape and appearance. Both of them has their own variations or modes of movement which can influence model performance in fitting process. On the other hand, the model initial estimation process influence the fitting process too in reaching convergence.

From the result of the experiment in implementing head tracking on main dataset, can be known that AAM method using the best parameter approximation could implemented head tracking with 95.33% system accuracy.

**Keywords:** head tracking, Active Appearance Model, Simultaneous Inverse Compositional, Shape Model, Appearance Model