ABSTRACT

The application that builded ini this final project is a pointer controller using eye movement (eye pointer). This application is one of image processing application, where the users just have to move their eye to control the computer pointer. This eye pointer is expected able to assist the usage of manual pointer during the presentation.

Since the title of this final project is using gaze tracking that follow the eye movement, so that is important to detect the center of the pupil. To track the gaze, it is necessary to detect the center of the pupil if the eye image is from the input camera. The gaze tracking is detected using the three-step hierarchy system. First, motion detection, object (eye) detection, and then pupil detection. For motion detection, the used method is identify the movement by dynamic compare the pixel ago by current pixel at t time. The eye region is detected using the Haar-like feature detection scheme, where the sistem must be trained first to get the cascade classifier that allow the sistem to detect the object in each frame that captured by camera. The center of pupil is detect using integral projection.

The final step is mapping the position of center of pupil to the screen of monitor using comparison scale between eye resolution with screen resolution. When detecting the eye gaze on the screen, the information (the distance and angle between eyes and a screen) is necessary to compute pointing coordinates on the screen. In this final project, the accuracy of this application is equal to 80% at eye movement with speed 1-2 second. And the optimum mean value is between 5 and 10. The optimum distance of user and the webcam is 40 cm from webcam.

Key word: Eye pointer, motion detection, image processing, object detection, Haar cascade, Haar like feature.