# ABSTRACT

Due to the increasing crime rate in crowded places such as public facilities, security camera systems have been installed in public facilities to act and prevent crimes from occurring. Videos from security systems are used to find crimes such as violence, theft, and so on.

In this final project, a system is designed that can tracking facial objects using a webcam and two servo motors. This face tracking system works by detecting the coordinates of the facial object's point on the webcam, then the servo motor will move the webcam according to the coordinates of the detected object. After getting the coordinates, the data will be modeled through the System Identification Toolbox to obtain Armax Polynomial Models and State Space Models.

The face tracking system succeeded in generating models as close as possible to the original data and obtaining state space models and polynomial models of armax. In horizontal or pan the accuracy value on state space models is 77,92% and on Armax models is 77.46%. Meanwhile, from the vertical or tilt the accuracy value for state space models is 64,05% and for Armax models is 79.42%.

***Keywords: Armax, Tracker, Servo Motor, Webcam***