

## ABSTRACT

Lately, the development of the railway industry in Indonesia greatly increased. Many developments have been carried out in the railway industry such as the MRT, LRT, and super-fast trains. To ensure safety in the railway industry, the train signaling system is the most important part that needs attention. The train signaling system is an electronic system that connects several equipment on the edge of the railroad tracks such as engine points, rail circuits, signal lights, and interlocking systems as controllers.

In this study, the design and simulation of a train signaling system wirelessly will be carried out using an android application. The train that will be used is a miniature train with three stations and infrared (IR) sensors as a train detector. For interlocking system using Finite State Machine (FSM) and using Arduino as controller.

The design of the train signaling system has been able to achieve a 100% success rate on the interlocking system with the average time required to receive data from the Arduino to the Android application and vice versa is 0.472 seconds. Light signals, point machine, and track circuits (train position) can be monitored in real time with the android application. In the train signaling system simulation, the time taken by the train for the AC and CA routes is 6.357 seconds with a braking time of 1.714 seconds. While the travel time for the BC and CB routes is 5.272 seconds with a braking time of 1.629 seconds. All signal lights will be red and the train will not run as long as there is another train in front of the main train or at the destination station. The set route button also won't work if it doesn't match the conditions.

**Keywords:** *Train Signaling System, IR Sensor, Android Application, Finite State Machine, Interlocking System.*