

## ABSTRACT

*Planting shallots sometimes result in crop failure, crop failure has several factors, one of which is that farmers do not understand soil conditions. So farmers are required to understand soil conditions so that the shallot plants grow optimally. There are 3 parameters to make shallot plants grow optimally, namely, soil moisture, soil temperature, and soil pH. In addition to understanding the soil conditions, farmers are also required to be able to control soil conditions. So we need a tool that is able to monitor and control the state of the soil.*

*In this final project, the design of monitoring and controlling soil conditions is based on soil moisture, soil temperature, and soil pH. The system is able to monitor soil conditions and is able to control humidity, temperature and soil pH automatically. For measurements, a capacitive soil moisture sensor, a soil temperature sensor, and a pH probe sensor are required. The values of these sensors will be attached to a smartphone using IoT (Internet of Things) communication. The IoT communication utilizes the IoT Platform as a place for data storage, which will later be sent to the android application. In addition, the sensor values will be processed using context aware algorithms and fuzzy logic methods. The use of the method plays a role in controlling the state of the soil automatically. The use of fuzzy logic methods to make automatic control more reliable. The output value of the fuzzy logic method will later have an effect on pump activity.*

*The tool is able to control soil conditions that are not optimal to being optimal. Obtained control time ranges from 11 different scenarios of 51-287 seconds. data or the value of the three sensors can be displayed on the android application using IoT communication, but IoT communication has a delay between devices. With a total delay of 7 seconds.*

**Keywords:** *Soil monitoring, internet of things, context aware, fuzzy logic, Antares*