

## ABSTRACT

In various fields, such as mining, agriculture, and the environment consider the information about the important of soil content. Many methods can be done to determine soil content under the surface. One of the method is Ground Penetrating Radar (GPR). GPR is a radar system that use to detect an object on the ground without having to dig it out. The GPR antenna sends an electromagnetic signal to the ground and then touches the object or target and then generates a wave of reflection that is then sent back by the receiver antenna.

At this time to move the GPR worked manually by moving itself, based on my colleague's experience is very ineffective most of them get a result that is not maximized and should be re-detection, because the movements inaccurate and unprecise. To solve this problem, an automatic control system is required to make the Mechanical Movement 2D for Ground penetrating Radar. Stepper Motor as the actuator for the GPR antenna movement and Arduino as the brain from the command maker of the tool, it can be made the GPR antenna that moves automatically.

In this thesis the shifting distance of mechanical movement system produces an accuracy value of 90.24% when the tool moves forward, and 88% when the tool moves backward. The precision movement value is 97% when the tool moves forward, and 91% when the tool moves backward. The recall value of tool performance is 92 % when the tool moves forward, and 94 % when the tool moves backward. The proposed mechanical movement is expected to provide a contribution in facilitating the detection of GPR and getting more accurate data.

Keywords: GPR, Radar System, Stepper Motor, Arduino