ABSTRACT

The role that birds play in natural ecosystems is crucial. Our obligation to preserve our flora and fauna requires that we consider the current state of our environment and the rapid expansion of industrialization. Numerous species of birds have been impacted, and some are already on the brink of extinction. The white starling or *Acridotheres melanopterus* and the suren starling *or Javan pied myna (Gracupica jalla)* are on the IUCN red list of endangered species maintained by the International Union for the Conservation of Nature and Natural Resources.

Bird tracking technology is one way to preserve their ecosystem. In this final project, a bird tracking system designed specifically for the transmitter will be developed. This system is equipped with a wearable antenna, allowing it to be integrated into the animal's body or accessories. The antenna proposed in this final project has a nylon-based textile substrate, making it flexible, lightweight, and inexpensive. To extend the range, the antenna will serve as a replacement antenna for the existing Wi-Fi module or WeMos D1 Mini Pro ESP8266 antenna, resonating at 2.4 GHz, Wi-Fi, or ISM frequency band.

The greater range is achieved when the developed antenna's gain is greater than the existing antenna's gain, which was 2 dBi. This antenna employs copper thread on the rectangular patch and the ground plane, sewn together using copper thread. This wearable antenna has achieved the expected results. The free-space simulation has a VSWR value of 1,069, a bandwidth of 270 MHz, a gain value of 4,538 dBi, and a unidirectional radiation pattern. While in the measurement, the VSWR value obtained an increase of 0.131 with a narrowing of the bandwidth of 70 MHz.

Keywords: Wearable antenna, nylon, copper yarn, ISM, SAR, tracking.