

## ABSTRACT

*The rapid development of information and communication technology has directed society towards the use of more practical and flexible systems. One of the rapidly advancing fields in IT today is artificial intelligence (AI). The use of AI has been applied to various sectors, including manufacturing, healthcare, transportation, and personal computers. Technological advancements are also found in computers, including the mouse.*

*In this final project, a virtual mouse system based on digital image processing using a hand landmark model has been constructed. This system can detect hand gestures as the output function for the cursor in operating a computer. The system is built using the Python programming language, along with the OpenCV library and the MediaPipe Framework. Gestures are detected through a camera or webcam as real-time object detection.*

*From the conducted testing, this final project demonstrates the ability of the virtual mouse to operate a computer with significant accuracy under various conditions. The system functions well in both indoor and outdoor environments, whether in bright or dark conditions, achieving a 100% accuracy rate at a distance of 100 cm from the webcam for all cursor functions on the virtual mouse. With the potential to reduce the limitations of physical mouse device usage, the design of the virtual mouse offers an interesting alternative in computer interaction development.*

**Keywords:** *Artificial intelligence, Hand landmark model, Virtual Mouse,*