

**IMPLEMENTASI SISTEM *MOUSE VIRTUAL*
BERBASIS KLASIFIKASI POSE TANGAN
BERDASARKAN *HAND LANDMARK MODEL*
DAN FITUR *EUCLIDEAN DISTANCE***

Oleh

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ABSTRAK

Interaksi manusia dan komputer yang alami dan intuitif menjadi kebutuhan penting di era teknologi modern. Penelitian ini mengusulkan implementasi sistem *mouse virtual* berbasis klasifikasi pose tangan yang memanfaatkan *hand landmark model* dan fitur *Euclidean distance*. Sistem ini dirancang untuk mengenali enam kelas pose tangan secara *real-time* menggunakan *webcam*, tanpa memerlukan perangkat keras tambahan. Proses pengembangan melibatkan deteksi 21 *landmark points* tangan dengan memanfaatkan modul *MediaPipe*, ekstraksi fitur spasial berbasis *Euclidean distance*, dan proses klasifikasi dengan algoritma *Support Vector Machine* (SVM). Pengujian dilakukan menggunakan *confusion matrix* dan *blackbox testing*, dengan menghasilkan nilai akurasi sebesar 93,65%, dengan performa stabil pada kecepatan pemrosesan 5 FPS dan latensi di bawah 100 ms. Sistem ini menawarkan solusi interaksi manusia dan komputer yang efisien dan fleksibel, dengan potensi aplikasi di bidang teknologi.

Kata kunci: *Mouse Virtual*, *Pose Tangan*, *Hand Landmark Model*, *Euclidean Distance*, *Support Vector Machine*, *Interaksi Manusia dan Komputer*.

***VIRTUAL MOUSE SYSTEM IMPLEMENTATION
BASED ON HAND POSE CLASSIFICATION
BASED ON HAND LANDMARK MODEL
AND EUCLIDEAN DISTANCE ALGORITHM FEATURES***

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ABSTRACT

Natural and intuitive human-computer interaction is an important need in the modern technology era. This study proposes the implementation of a virtual mouse system based on hand pose classification that utilizes the hand landmark model and Euclidean distance features. This system is designed to recognize six classes of hand poses in real-time using a webcam, without the need for additional hardware. The development process involves the detection of 21 hand landmark points using MediaPipe, spatial feature extraction based on Euclidean distance, and the classification process using the Support Vector Machine (SVM) algorithm. Testing was carried out using confusion matrix and blackbox testing, resulting in an accuracy value of 93.65%, with stable performance at a processing speed of 5 FPS and latency below 100 ms. This system offers an efficient and flexible human-computer interaction solution, with potential applications in the field of technology.

Keyword: Virtual Mouse, Hand Pose, Hand Landmark, Euclidean Distance, Support Vector Machine, Human-Computer Interaction.