Republic of Iraq
Ministry of Higher Education and Scientific Research
University of Babylon
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Department of Information Networks

التحكم في الكمبيوتر بإيماءة اليد باستخدام الذكاء الاصطناعي

Controlling Computer with a Hand Gesture Using Artificial Intelligence

مشروع التخرج هو احد متطلبات الحصول على درجة البكالوريوس في تخصص شبكات المعلومات في تكنولوجيا المعلومات.

A Project
Submitted to the University of Babylon / College of information technology / Department of Information Networks in Partial Fulfilment of the Requirements of the bachelor's degree in Information Networks

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2024

Abstract

Hand gesture recognition is a rapidly developing field of artificial intelligence that is being used to create innovative new ways for people to interact with devices. This paper proposes a hand gesture-controlled virtual mouse system that uses AI algorithms to recognize hand gestures and translate them into mouse movements. This system is intended to offer an alternative interface for users who struggle with traditional mice. The proposed system uses a camera to capture images of the user's hand, which are then processed by an AI algorithm to recognize the gestures being made. The system is trained on a dataset of hand gestures to learn to recognize different gestures. Once a gesture is recognized, it is translated into a corresponding mouse movement, which is then executed on the virtual screen. This system is designed to scale and adapt to various environments and devices. All input operations can be virtually controlled using dynamic or static hand gestures, or in combination with a voice assistant. The system uses machine learning and computer vision algorithms to recognize hand gestures and voice commands, and does not require any additional hardware. The system is implemented using a convolutional neural network (CNN) and the MediaPipe framework. It has potential applications such as enabling hands-free operation of devices in hazardous environments and providing an alternative interface for people with disabilities. Overall, the hand gesture-controlled virtual mouse system offers a promising approach to enhancing user experience and improving accessibility through human-computer interaction.