Real Time Screen Control Using Gesture, Image and Voice Control 2024

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*Abstract* -The project aims to revolutionize the way users interact with their screens by providing a seamless and intuitive control system utilizing gestures, images, and voice commands in real-time. presents a cutting-edge system designed to revolutionize user interaction with screens by integrating gesture recognition, image recognition, and voice control functionalities. Leveraging the power of artificial intelligence (AI) and deep learning models, our system enables users to control their screens effortlessly and intuitively in real-time. Through the use of convolutional neural networks (CNNs) for gesture recognition, object detection models for image recognition, and deep learning-based speech recognition models, users can perform a wide range of actions, including scrolling, clicking, opening applications, and navigating menus, simply by gesturing, displaying specific images, or issuing voice commands. This innovative approach enhances user productivity and accessibility across various domains, such as presentations, gaming, and home automation. By addressing challenges such as data availability, model complexity, and privacy concerns, our system ensures robust performance and user satisfaction, providing a seamless and natural screen control experience for users of all levels of expertise.

*Index Terms* – Artificial Intelligence, Control System, Deep Learning, Gesture Recognition, Image Recognition, Interaction, Natural, Productivity, Real-time, Screen, Speech Recognition, System, User Interface, Voice Control

I. INTRODUCTION

Gesture-based interaction systems have significantly advanced human-computer interaction by offering a natural and intuitive communication mode, transcending the limitations of traditional input devices like keyboards and mice. These systems employ gesture recognition algorithms to interpret human gestures, finding applications across virtual reality, gaming, robotics, and assistive technology. Notably, gesture recognition facilitates screen control and sign language detection. The former allows users to control the cursor and execute screen commands through hand gestures, while the latter employs machine learning algorithms to recognize sign language gestures, enhancing communication for the deaf community.

In this paper, we introduce a system that leverages gesture recognition for both screen control and sign language detection. Utilizing the MediaPipe framework for hand tracking and machine learning models for gesture classification, our system includes a gesture-based mouse controller and a sign language character recognizer. Implemented primarily in Python, the system leverages libraries such as OpenCV, scikit-learn, PyAutoGUI, and NumPy. This development not only advances gesture recognition technology but also holds significant implications for improving human-computer interaction and accessibility for individuals with disabilities.

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TABLE I

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|  |  |  |
| --- | --- | --- |
| Points | Type of Text | Type Styles |
| 8  10  8  8  8  10  10  10  10  10  10  11  24 | Table text  Figure and Table Headings  Figure and Table Captions  Footnote  Reference list  Abstract  Index Terms  Section Titles  Main Text and Equations  Subheadings  Author email  Author name  Title | UPPERCASE  Small Caps  **Bold**  **Small Caps, Bold**  *Italic*, Left justified  Title Case |



Figure I

Logo of the Institute for Electrical and Electronics Engineers

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*2jk ∂u/∂z = ∂2u/∂x2 + k2 (n2* - β*2) u*  (1)

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