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Ergonomic Virtual Keyboard

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OUTLINE

RESEARCH BACKGROUND

- Initial studies in gesture recognition focused on basic hand movements and simple gestures, often using early computer vision techniques and specialized hardware.
- The development of more sophisticated sensors, such as RGB-D cameras (e.g., Microsoft Kinect), and improvements in computer vision algorithms have significantly enhanced the accuracy and usability of gesture-based input systems.
- This field integrates principles from human-computer interaction (HCI), computer vision, and machine learning. Here's a detailed look into the research background:

PROBLEM DEFINITION

- The system will use an on-screen keyboard where the current letters will be entered based on hand movements.
- When the index and middle fingers meet on a virtual key, a click is generated, and the desired text is displayed in the corresponding text box.
- Very slow to interact with Computer (Document Typing, Coding, etc.)
- Waste of usable screen area.
- Inconvenient to type in public places.

PROPOSED SYSTEM

- Uses a Camera or Sensors to detect our finger movements and predict which key is typing.
- By detecting both hands and tracking the fingertips trajectories and patterns, the system predicts intended keystrokes with high precision, users interact with this virtual keyboard by mimicking typing motions.
- It is convenient to use at any place.
- Easy to Type as Touch typing.
- Can also be used in Mixed Reality applications.
- Can be paired with both small and large devices.

CONCLUSION

- The research focuses on developing a model for gesture-controlled computing that integrates with hand gestures.
- This model aims to enhance user interaction with computers by leveraging advanced technologies such as Convolutional Neural Networks (CNNs) and MediaPipe.
- The primary objective is to create a versatile and efficient control system with significant applications in typing and coding environments.

REFERENCES

Dr. Mohd Nazeer1, Shri Akshita. G2, *"Gesture Controlled Virtual Mouse and Keyboard using OpenCV"*, International Conference on Emerging Techniques in Computational Intelligence, September 2023