

Camera Based Touchless Interface

Degree project report



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CERTIFICATE

We accept the work contained in the degree project report titled (Camera Based Touchless Interface) as a confirmation to the required standard for the partial fulfillment the degree of BCE.

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Acknowledgement

I would like to express my sincere thanks to Dr. Usman Akram for their encouragement, guidance and advice throughout my project. I immensely benefited from their technical insights, vision and profound thinking. He is my great teacher.

Dedication

Umar Jamal, Bilal Ahmad Khan

This Thesis is lovingly dedicated to our respective parents who have been our constant source of inspiration. They have given us the drive and discipline to tackle any task with enthusiasm and determination. Without their love and support this project would not have been made possible.

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Abstract

Natural user interface is one of the major focuses of research in computer vision because of computers enlarge integration in our daily lives. For intuitive human-computer interaction, hand gestures are the appealing option rather than face or eye gaze. To achieve this goal, computer should be made responsive and visually intelligent so it can recognize hand gestures. Hand recognition is complex and challenging problem due to its high degree of freedom.

Many preceding research shows the detection based on edge, texture, and color to classify an object. Those techniques were less efficient. This thesis show a low-level approach which focus on hand detection and tracking with Haar-like features and AdaBoost algorithm. The Haar-like features are used to get the appearance properties of objects. The adaboost algorithm speeds up the training and constructs accurate strong classifier by combining weak classifiers. Different hand postures are recognized by parallel cascading. The acquired coordinates are used to generate touch events in different computer screens which virtually create a touchless interface. With implementation of this system, virtual objects can be manipulated by different hand movements. An application of this robust identification system is that different inputs can be generated by different postures.

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