**A Real-time Hand Gesture Recognition Algorithm For an Embedded System**

**ABSTRACT**

With rapid developments in technology, intelligent robotics has been used in a wide range of fields. However, robotics must become easier to use for general users in order to expand the scope of applications of intelligent robotics in our everyday life. A motion authoring method using hand, robot interaction is capable of authoring robot motion according to the hand fingers. With the exception of language, the hand is most frequently used for human communication among our body parts such as hands, eyes, mouth, arms and legs. This project explains how robot motion can be controlled according to the hand and verifies the effectiveness of the proposed approach based on implementing through ARM Cortex-A9 with our algorithm. The project is especially for disabled persons, who cannot perform actions as normal people. But in this project we have implemented a gesture algorithm such to control a system by giving their hand gestures.

**Existing Work:**

In the existing work, the system was developed using a skin color model and GMM which are very inaccurate techniques for hand gesture detection as well as no practical implementation of robot device control using gestures were done.

**Proposed Work:**

In the proposed system, we will implement the Hand Gesture recognition based on Convex Hull Method over a ARM Cortex A9 processor board. The Convex hull algorithm may be defined as the intersection of all convex sets containing over the gesture image which is very accurate in defining the exact gesture by the user, and will implement 4 gestures to control the robot, i.e. Start, Stop, Front, Back.

**BLOCK DIAGRAM**

**Hardware:**

ARM Cortex-A9, USB Camera (UVC Compatible), Robotic platform, Zigbee

**Software:**

**OS:** Embedded Linux, **Language:** C/ C++, **IDE:** Qt Creator, Open CV Algorithms

**Applications:**

Handicap Persons, Remote device control.

**Advantages:**

* As Cortex -A9 quad core CPU is used; future modification is done easily according to our need.
* It can be modified & can be applied to other robotic applications also.