

# HMM-based phoneme speech recognition system for control and command of industrial robots

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## Abstract

Speech recognition is a prominent technology, which helps us to develop a Natural language interface through speech for the Human-Robot Interaction (HRI). It allows the computer to take the spoken instructions, interpret it, and generate text from it. In this paper, we propose a phoneme based speech recognition system to control industrial robots. Speech recognition has become one of the popular interfaces when it comes to reducing robot operator's efforts to control and command the robot. This paper intends to investigate the potential of Linear Predictive coding technique to develop a stable and robust phoneme speech recognition system for robotics applications. Our system is divided into three segments: a microphone array, a voice module, and a 3-DOF robotic arm. To validate our approach, we have performed tests with simple and complex sentences for various robotics activities like manipulating a cube and pick and place tasks. Moreover, we also analyzed the test result to rectify the problems and limitations in our approach. The paper presents all the test results which we have achieved through conducting experiments on our project.

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