

Hand Gesture Recognition in Images and Video

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Abstract- As the integration of digital cameras within personal computing devices becomes a major trend, a real opportunity exists to develop more natural Human-Computer Interfaces that rely on user gestures. In this work, we present a system that acquires and classifies users' hand gestures from images and videos. Using inputs from low resolution off-the-shelf web cameras, our algorithm identifies the location and shape of the depicted hand gesture and classifies it into one of several predefined gestures. Our algorithm first applies image processing techniques on the images in order to cancel background and noise effects on the image, it then extracts relevant features for classification and finally classifies the gesture features using a multiclass Support Vector Machine classifier. The algorithm is robust and operates well on several different backgrounds, lighting and noise conditions. Our method achieves an average 97.8% accuracy rate in several cases and it is suitable for both real-time and offline classification.



1. INTRODUCTION

Digital cameras are now integrated into personal computers, mobile cellular devices and handheld computers. These devices usually include a powerful microprocessor, capable of performing millions of computations per second. As microprocessor and digital camera technologies advance, it is now possible to use these resources in order to create new human computer interfaces that are based on recognition of users' gestures. Gesture recognition interfaces can be used as a natural communication channel between humans and machines and give rise to a plethora of applications such as hardware-free remote controls, sign language interpretation [8] and other human welfare applications [1].