Course : Big Data Content Analytics

Assignment – Final Project Report

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Description

We are currently working on a project based on Lip Reading theme. It can be used for diverse research fields like visual both speech recognition and face detection. Lip Reading allows us to listen to a speaker by watching the speaker's face to figure out his speech words, movements and expressions. Furthermore, learning to lip read can also include reading and evaluating the information provided by facial expressions, body language and gestures in conjunction with the words being said. Moreover, we can always use vision to assist with listening. Last but not least we can also use prior knowledge to fill in the gaps that can occur in understanding since it is impossible to read every word said.

Our **target** in this project is to set up and train a model which can predict specific words that speakers said. Our Lip Reading dataset was downloaded from kaggle web site and includes both depth and color images. In other words, fifteen speakers (five men and ten women) positioned in the frustum of a MS Kinect sensor and utter ten times a set of ten words and ten phrases. Each instance of the dataset consists of a synchronized sequence of color and depth images.

Reasons which we chose to investigate Lip Reading are numerous. Some people have difficulties in speaking, therefore they are practically impossible to read. However, most people are much easier to read. Moreover, due to the fact that lip reading depends on visual cues, lip readers must have good eyesight. Lip readers need clear light since it is impossible to read in the dark. In addition, Lip Reading as a technique is quite exhaustive for the brain. We are usually unaware of the influence of visual cues on heard speech. We can spot the connection only when they contradict the auditory information. For example, when watching a poorly dubbed movie: the late or early onset of the speaker's lip movements hampers our ability to hear what is otherwise a clean auditory signal. Another reason which makes Lip Reading interesting is that Lip Reading is not merely figuring out the lip movements. It is an extensive study of the context and body language too. Even the most talented lip readers are not able to gather a full message based solely on lip reading. Irrespective of their good skills at interpreting facial cues, they need to observe body language and context to figure it all out. Another important reason is that Lip reading is easier in case of soft tones compared to loud voice. The enunciation slows down when the speaker whispers, making the vowels more pronounced and elongated, which makes lip reading easier. The longer the information, the easier it is to lip read. Talking about short speeches, there is no context or sentence flow to work with to fill the gaps of any missed words. That's why elaborate thoughts and sentences work best.

Reading the lips is not a simple matter. There are just some situations that make it impossible to lip read all the content, but what is important is to understand and communicate as much as possible. But there some tips that make Lip Reading more effective. Being able to see the person's entire face, expressions, gestures and even body movement can help with reading and better communication. Facial expressions, in particular, can give very important clues about the topic and the speaker's mood. Lip Readers may be aware of the position of the speaker and try to stand in position six feet or less from the speaker since this will make it easier to see body language, lip and facial movements. Another approach that Lip Readers may follow is that they should make an attempt to relax when needing to lip read since tension and stress can make it harder to concentrate on the other person and they do not put pressure on theirselves to read the other person's lips, expressions or gestures. Lip Readers should try to identify the topic as early as

possible. Knowing the topic of the conversation will help them fill in a lot of what is missed during lip reading. Last but not least, readers also do not attempt to read every word said. Instead, they can focus on the topic of the conversation and in full sentences. This will help with figuring out the rhythm of the speech patterns and help with overall lip reading.