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Mrs. Secord

ISM 1

25 February 2022

Research Assessment #19

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Subject: Introduction to Hand Gesture Recognition

MLA citation(s):

Benaffane, Yacine. “[Deep Learning] Hand Gesture Recognition.” *Medium*, Becoming Human: Artificial Intelligence Magazine, 18 June 2020,
<https://becominghuman.ai/deep-learning-hand-gesture-recognition-b265f4e6cf02>.

Assessment:

Focusing on my final product of creating a hand gestures recognition project that can perform basic and even some complex functions hands-free on mobile devices and other forms of technology, I decided to explore how hand recognition works as well as the complexities and data management that is required to create my final product. Hence, I was trying to get a deeper understanding on the problems that could possibly come up during the creation of my final product and was thinking of several concepts/verbose to learn in order to get familiar with hand gestures recognition. To find this information about hand gestures recognition, I found the article, “[Deep Learning] Hand Gesture Recognition,” which went over a video that showcased an actual hand gestures project and the basic logic underlying the model as well as some complexities and datasets that I could keep in mind when creating my final product. It also helped build a clearer picture in my head on what direction I could go with this project.

After viewing the article, I was able to learn about how hand gesture recognition works particularly with sign language and was able to obtain a better understanding of certain concepts such as contour, defects, and a convection. Through the video in the article, I was able to learn how we could analyze hand gestures by essentially drawing “boxes” with lines called contours as well as defects such as gaps between our fingers that could be measured and detected by the model (Bannafane). I also learned about how we could visualize this data by only allowing the hand to be seen and removing the extra noise/unnecessary areas. This would help us focus on the hand’s motion and its different fingers rather than accounting for the background or any other particular noise. With my general knowledge of computer vision, this video was able to help me understand how this process could work. I was also able to obtain access to several resources for creating a hand gestures recognition project such as Kaggle machine learning datasets, research datasets with detailed and accurate images, and actual machine learning models that implement hand gestures for sign language professionally. I also learned about some possible complications/problems in computer vision when analyzing hand gestures such as how difficult dynamic analysis is for videos that have hand gestures, or the possible difficulties in the continuous processing of many actions to communicate one single word/task, or even the lack of accountability for facial expression that often completes the story or message we try to create with our hands (Bannafane 4). These different factors must be accounted for in a particular way to create a very accurate and successful model for recognizing hand gestures and with this article, I hope to dig deeper into convolutional neural networks and image analysis to create my final product!

I am planning to view and understand some relevant algorithms, computer vision essentials, and possible machine learning integration in applications to plan and design my final

product's pathway in ISM! I will possibly start working on my final product soon with my learning that I will gain from this essential computer vision research as well as my learning from my original work. I am looking forward to starting my mentor visits virtually and in-person, and starting my final product!