**Reflective journal – Chi or Muffin**

The objective of this lab is to help develop fundamental knowledge on image classification, and neural networks. After completing this lab, I have gained some knowledge, and practical skills on neural networks, as well as the necessary libraries required for neural networks, such as PyTorch. There is a lot more to learn when it comes to convolutional neural networks (CNNs), however, this lab helped get my feet wet regarding the functionality of neural network training.

            During the lab, I utilized techniques such as data augmentation, data preprocessing, etc. These processes improve the quality of the training data, removing the need to get more data. Learned more about the usefulness of jupyter notebook, as it aided my learning experience with an interactive coding environment.

            Key concepts I learned during the lab include:

-        Convolutional neural networks

-        Image classification

-        Transfer learning

-        Data augmentation

-        Data preprocessing

**Convolutional neural networks (CNNs):** They are necessary for the breakdown of digital images to recognize key features of an image. This process is done through multiple processes such as identifying the shapes, colors, edges, etc. It is one of the many complex concepts in computer vision. CNNs are still tricky, however, I have an idea of their role in AI training.

**Image classification**: Another important concept I learned is categorizing images in predefined classes. I understood how AI models interpret pixel values and identify patterns.

**Transfer learning**: I learned a method of learning known as transfer learning; this involves utilizing pre-trained models on small datasets.

**Data Augmentation**: This is a method whereby training data is manipulated manually to reduce the need to collect more data. The size and diversity of the data can be changed by applying different transformations.

**Data preprocessing**: This process involves resizing images to a uniform size to speed up the training process.

            Given the fact that this is all new and complex information, I did experience some challenges while working the lab. The major challenge was understanding what I was doing in the first place, and what I was supposed to achieve after running each code cell. I have gained some understanding; however, I still have a lot of questions and personal research to do to comprehend the concepts properly. While working through the lab, I utilized the internet to help me with errors I got while running certain codes, and it also helped me understand the cells with long lines of code, and I gained a good comprehension of how each line corporates with others to progress in the lab.

            At the end of the lab, I trained an AI model to differentiate between chihuahuas and muffins with average accuracy. I plan on playing around with the lab later, to try and improve the accuracy.

            It is imperative that I get a good comprehension of neural networks and deep learning because there are many ways it can be applied to the real world. Three important sectors it can be applied to are the auto industry, healthcare, and security.

Improving the technology can help individuals commute safely as sophisticated machines have better reflexes than humans, there will be a decrease in road accidents if accident precursors such as object detection and lane assists are improved.

Computer vision can help save lives by detecting tumors and other anomalies in X-rays, CT scans, etc. A sophisticated object detection machine will be able to detect faces regardless of environmental factors in public areas. This will improve security and prevent catastrophes.

Overall, I am glad I worked through this lab; I look forward to gaining more knowledge as I progress through this class.

**Works Cited**

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