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| CNNs - JOURNAL |  |
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This lab assignment required training a Convolutional Neural Network (CNN) to differentiate between Chihuahua’s and muffins. This task might be basic for humans, but it takes quite some time and computations to help a neural network learn with just 50% accuracy. This lab used a CNN designed for handling image data.

CNNs differ from the traditional neural networks in several ways, CNNs utilize convolutional layers to detect patterns such as edges, texture, and shapes in images. It slides filters across the image and learns important visual features for classification. CNNs help retain valuable information without significant increase in computational load, this is a significant difference from traditional neural networks because, they apply dense layers and treat each pixel individually, which leads to more computational power.

Based on my results, CNN gave better accuracy and efficiency, with better results when epochs, and learning rates were modified. With about 10 epochs, the model displayed impressive proficiency in identifying dogs and muffins. The major observation was that the accuracy decreased on photos that had extra lighting and blur.

A collage of different dogs

Description automatically generated

CNNs have unlimited real-world applications such as in auto industry, medical imaging, security systems, and manufacturing. In the auto industry, it can be applied to autonomous vehicles for object detection, which is crucial for safety in transportation. It can also be applied to manned vehicles in systems like automatic braking, blind spot detection, etc. The health industry will benefit from increased efficiency in identifying anomalies such as cancers, tumors, etc. Security systems like facial recognition and weapons detection will help keep lives and properties safe.

The development of CNNs raises ethical concerns, like all things in life, there are some shortcomings that will need to be addressed to please as many people as possible. An ethical area is bias. Training data must lack bias for it to not uphold social inequalities. It is important that publicly available models must be trained on diverse data. Another area is privacy, violation of privacy is something a lot of people do not take lightly and it is imperative that models are deployed with proper oversight.

In conclusion, this lab provided a hands-on experience regarding the complexity of CNNs. I bear full witness to the differences between traditional neural networks, and CNNs, I gained additional knowledge and understanding about neural networks by reflecting on the lab, experimenting with the codes, and understanding ethical disadvantages.

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**Works Cited**

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