Unit 9: Introduction to Convolutional Neural Networks (CNNs)
Unit 9 Artefacts

e-Portfolio Activity - CNN Model Activity

Learning Outcomes

- Articulate the legal, social, ethical and professional issues faced by machine learning professionals.

I read the Wall (2019) article and specifically considered the legal, ethical, professional, and social implications of CNN technology.

Legal issues I considered included data privacy especially regarding what data is used for training the CNN models and who controls/protects this. Consent for using data and anonymisation are key concepts here. Another legal consideration is that of intellectual property, i.e. proper licensing of data for model training etc.

Social and ethical implications are fascinating and wide reaching. For example, bias and fairness are crucial concerns. CNN models may inadvertently learn and propagate biases depending on the training data and tuning implications from the ML professional themselves. One needs to remain aware of potential sources of bias from data and themselves because biased models could have wide reaching implications. Unfair treatment of certain groups in applications like facial recognition as described in the article is a serious consequence of this. Other social issues involve accessibility, ensuring the benefits of the CNN technologies are accessible to all and the benefits are shared fairly across society.

Ethical issues include concerns around surveillance and privacy because CNN technology for object recognition can used for population and individual surveillance, which raises concerns about potential abuse and breaches of rights to privacy. Another key pillar of ethical considerations includes transparency and accountability. ML professionals need to be transparent about how the models are used and how the decision-making processes of the model in the human context is used to effect society. Ultimately, who is accountable for the decisions made by the models and the actions taken on these? This is critical in ML development and deployment.

Finally, professional issues include the requirement for responsibility on the part of ML professionals to ensure that the models developed are robust, fair and do not cause harm. Keeping up to date with the latest understanding about the technology and legal/ethical concepts through continuous learning is critical therefore.

I then ran this CNN model - Convolutional Neural Networks (CNN) - Object Recognition.ipynb - and went through the different sections of the algorithm in turn to supplement my learning. I found this very helpful for my individual presentation on CNNs for object recognition. I was tasked with changing the input image for prediction by changing the value of this variable to see whether the model predicts correctly and the results for a couple of experiments are below:

Predicting on single image
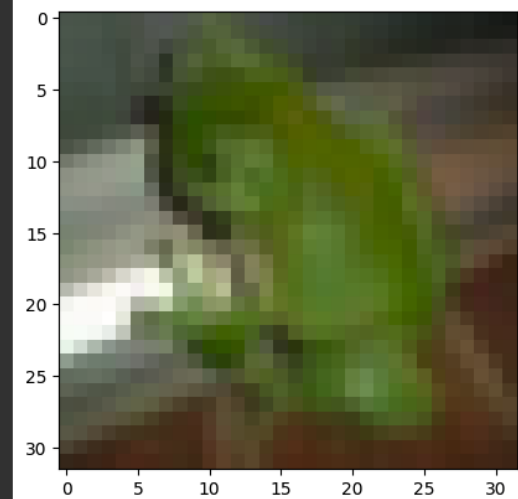
```
plt.imshow(x_test[10])
```

<matplotlib.image.AxesImage at 0x7ee8325ea050>
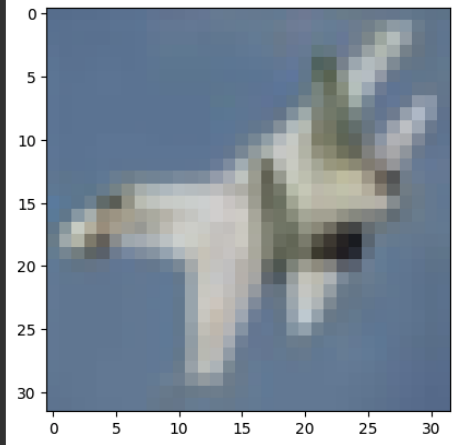
Predicting on single image

```
plt.imshow(x_test[7])
```

<matplotlib.image.AxesImage at 0x7ee8326661a0>

References:

Wall. Biased and wrong? Facial recognition tech in the dock. 2019. Online at:
https://www.bbc.co.uk/news/business-48842750 Accessed on: 23.05.2024