**Assignment 02**

**Part A**

1. The two image datasets used for the class were a corgi plushie and a novel. I took 50 images for each object. I decided to use these objects because I could take a variety of interesting pictures with them (e.g., showing different pages of the book.)

Here is an image of the corgi plushie: Here is an image of the book:

A stuffed dog on a wood floor

Description automatically generated A book on a wood surface

Description automatically generated

1. For this assignment, we are asked to create an image detection AI model to put objects into their specified category.
2. These are the steps used to train the model:
   1. First, I created an account on Edge Impulse
   2. I added a device that can access the training models.
   3. I uploaded the image folders of each object, plus a third folder named Others with 50 pictures of random objects, all folders had the option of dividing their content for training and testing (i.e., 80% of images of each folder were used for training and 20% were used for testing), I also added labelling on each object.
   4. After uploading the images, I created an impulse for the model.
   5. After creating the impulse, I ensured the raw images were on RGB and then generated their features.
   6. Once their features were generated, I selected neural network settings and a model and then started training the object detection model.
   7. After transferring images into the model, I enabled EON Tuner and selected the most accurate architecture that does not exceed the performance limits of the model.
   8. After selecting the architecture, I retrained the model.
   9. Once retrained, I did a live classification by loading several samples from each image category.
   10. Once I tested the image samples, I did the model testing to verify the model's accuracy.
3. My model had very good results (i.e., 90% accuracy with model testing), but it was not 100% perfect. How well did your dataset do in terms of **Accuracy, Precision and Recall**?
4. Take screen grabs of the graphs available through the Feature Explorer for both the training and test/ live classification sets. Discuss the graphs in detail.
5. I think better is about accuracy. It is when the model can distinguish the images and associate them with its specified label.

Provide brief postulations for how you think you could get your model to perform better. What does better mean?

Part B **The construction of a model with one of your objects and one of someone else’s objects:**

1. I used Pat's image dataset for the second part of the assignment. This dataset contained three object folders: fork pictures, pin pictures and miscellaneous items. Each folder contained 50 images. Pat had the generosity of sharing their images with our group, so I used their dataset for the assignment. Because I have no idea of what the images look like, I decided to use the fork and miscellaneous items folders from Pat’s dataset, so I am sure I am not biasing any results. I combined them with my corgi image folder because the colour tones between the fork and the plushie are similar (or at least in the same range of colour.)

Here’s an image of the fork: Here’s an image of the corgi plushie:

A wooden fork on a white surface

Description automatically generated A stuffed dog on a wood floor

Description automatically generated

1. For this part of the assignment, the goal was to train a model by using someone else image dataset and verify if there are any issues within both datasets while generating with unknown images. It allows us to verify any biases involved within the previously trained model and make sure that the images from both datasets provide accurate or reliable results.
2. I have noticed that my model was more accurate with my dataset than theirs. How well did your revised dataset do in terms of **Accuracy, Precision and Recall**?
3. Take screen grabs of the graphs available through the Feature Explorer for both the training and test/ live classification sets. Discuss the graphs in detail.
4. As mentioned previously, the model I trained on my dataset gave a higher accuracy percentage than Pat’s. Provide brief postulations for how this model performed in contrast to PART A. Why?

**Part C**

I think this type of object recognition model can be used to collect data about the fauna of a forest and see if there’s a risk of endangered animals within the environment. For example, if we do not detect many beings of a certain species, it can be an indicator of extinction.

And provide a storyboard describing the scenario above as well.

Once the folders were uploaded, I selected the position of the object in each image and labelled them with their specific category