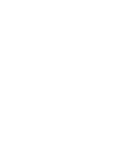
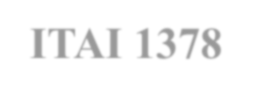
1



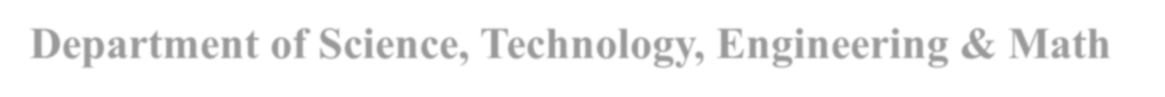
# Sharise Griggs



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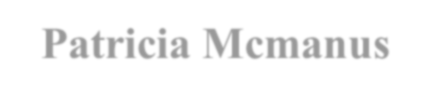
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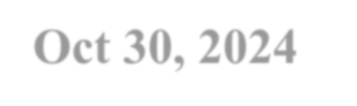
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**REFLECTION:**

**Reflection Journal: Object Detection with VOC2007 and SSD MobileNet V2**

In this lab, I learned how object detection differs from basic image classification. While classification assigns a label to an entire image, object detection locates and identifies multiple objects within a single image. This made it exciting, as I could see bounding boxes around detected objects, which felt like the model was “seeing” them. Uploading my own image and watching the model’s responses made the lab feel more personal and interactive.

We used the SSD MobileNet V2 model for this exercise, a lightweight model suitable for devices with limited computing power. I learned that SSD (Single Shot Detector) models are designed for speed, which makes them a good choice when resources are tight. However, this comes with trade-offs, as SSD MobileNet V2 may miss smaller or overlapping objects because it prioritizes speed over high precision. This model would work well in simpler applications, but for more complex tasks, a more powerful model might be needed.

To manage the large VOC2007 dataset, the find\_images\_with\_classes function came in handy. This function filters for specific classes of objects, allowing us to focus on particular categories, which was helpful in organizing such a large dataset. The threshold setting in the plot\_detections function also played a role; setting it to 0.5 meant that only objects with at least 50% confidence were displayed, which helped reduce clutter and focus on the more certain detections. Additionally, the heatmap visualization provided insight into the model’s confidence in its predictions, helping me understand where the model was most certain about its detections.

Running the model on different images, including my own, gave me a sense of where it performed best and where it struggled. It detected large, clear objects like people or vehicles quite accurately, but smaller objects or those in cluttered backgrounds were often missed or incorrectly boxed. For example, in my uploaded image, the model detected [specific objects if any], but it missed [any specific instances if applicable], likely due to lighting or background distractions. This experience made me curious about how the model might improve if trained on the entire VOC2007 dataset. More data could help the model recognize a wider range of objects and become more accurate overall.

Reflecting on this, I think I could modify the code to detect only specific objects, like animals or vehicles, by adjusting it to focus on certain class labels in class\_names. However, training an object detection model from scratch would require more than code modifications. It would need a labeled dataset, a powerful model architecture, and significant computing power. Key challenges would include handling large datasets and managing the time it takes to train such a model, especially for detailed or high-accuracy detections.

Despite its limitations, SSD MobileNet V2 could be useful in real-world applications where quick, general detections are enough, such as in traffic monitoring or people counting. For detailed object detection tasks, though, a more precise model would be necessary. Researching other models on TensorFlow Hub showed that each model has its trade-offs between speed and accuracy, with more accurate models requiring more resources. Comparing my results from this lab with a more powerful model’s results would likely show that SSD MobileNet V2 performs faster but with less detail.

Overall, this lab gave me a foundational understanding of object detection, allowing me to see how models work in recognizing and locating objects within images. The hands-on experience, especially with uploading my own image, made the learning process engaging and highlighted the practical challenges and possibilities in AI-based vision tasks.

References: [Lab9VOC2007\_\_Dataset\_student\_Notebook\_LAB\_Object\_Detection\_transfer\_learning\_(1) (1).ipynb - Colab (google.com)](https://colab.research.google.com/drive/1zmMQiM9KAnFh0zEPXBfnkOrphtaPWM1z)