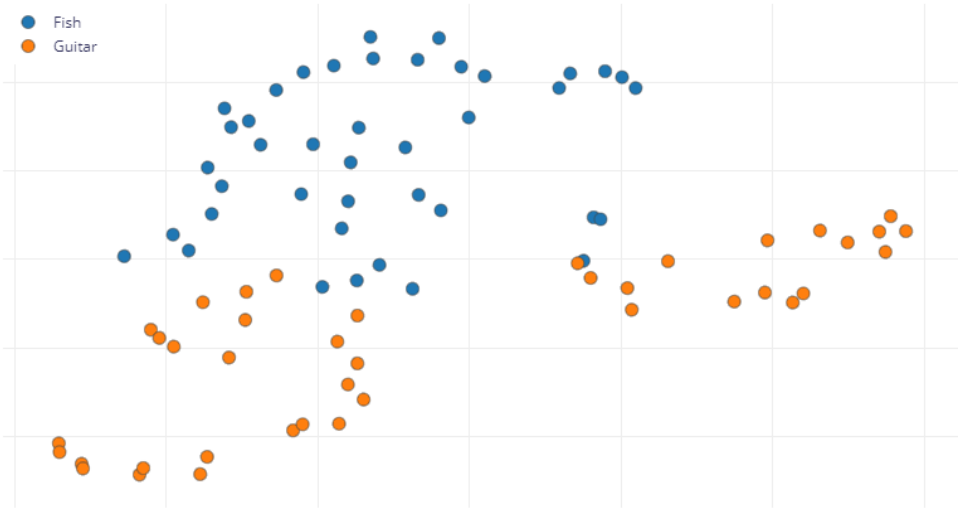
PART A: The construction of a model with only your data.

- The initial data set I have brought to class were 2 objects. One of which was a figurine of a fish from Jamaica. The other was a miniature figure of a guitar. I choose these two objects because they provide their own distinct differences between the two of them. 50 pictures of each.

- In our class assignment, we were tasked with uploading our objects to the website known as Edge Impulse. This platform employs machine learning to train on the uploaded objects, generating graphs and algorithms specific to each object. For instance, after training on a guitar figurine, the model associates any image not featuring a guitar with another object. Conversely, if an image of the trained guitar figurine is presented, the model accurately associates it with a guitar.
- The process began by generating an impulse to determine the desired size for the objects submitted in the image. Approximately 100 pictures were then uploaded to the model. Following the completion of the upload, the model underwent training to discern differences between the two uploaded objects based on the images. The model's accuracy was assessed, and in my case, it achieved a perfect score of 100%. Subsequently, there was an option to retrain the model, but given the flawless performance, there was no need for retraining. To conclude the steps, the model was deployed onto an HTML page, allowing for the testing of its functionalities with a webcam to evaluate its ability to distinguish between the fish and the guitar.
- My model had a success rate of 100%, with its accuracy and precision. I think this is the case because of how distinctly different both objects are.

Feature explorer



On-device performance

PROCESSING TIME
11 ms.

PEAK RAM USAGE
4 KB

Last training performance (validation set)

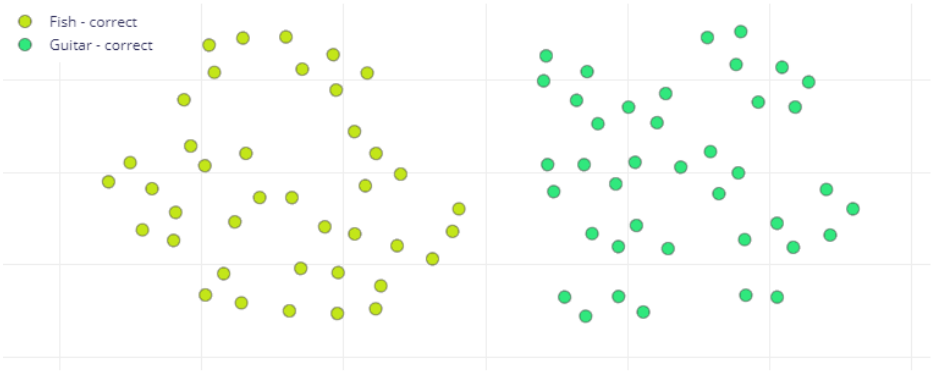
ACCURACY
100.0%

LOSS
0.00

Confusion matrix (validation set)

	FISH	GUITAR
FISH	100%	0%
GUITAR	0%	100%
F1 SCORE	1.00	1.00

Data explorer (full training set)

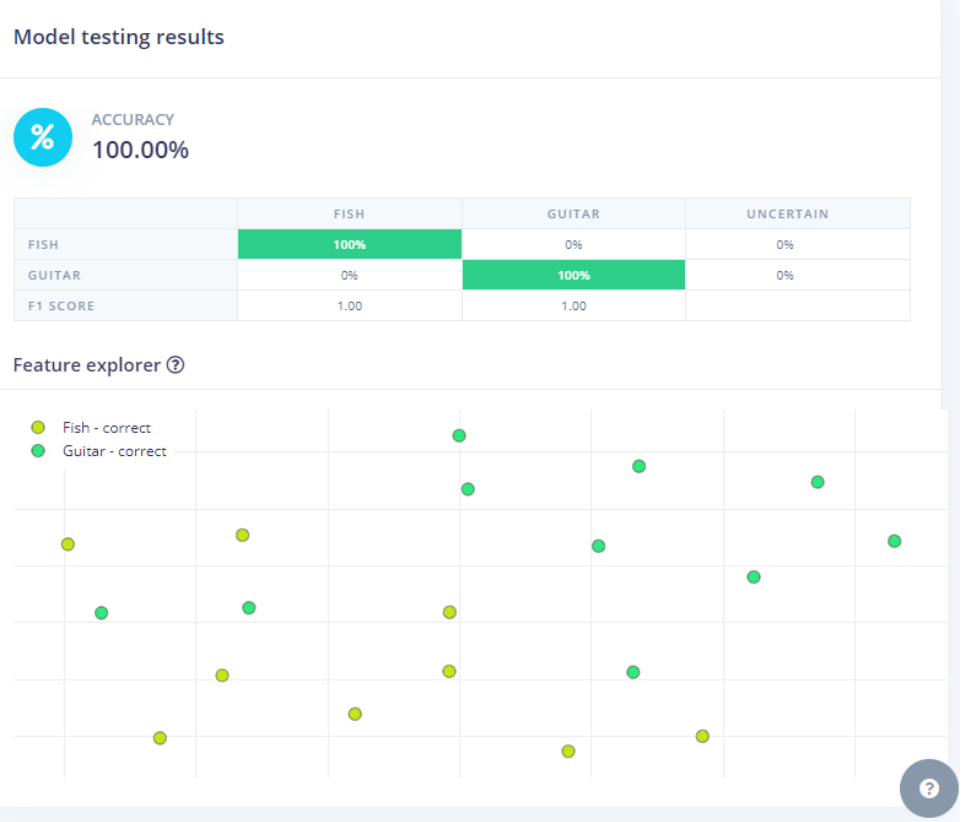


On-device performance

INFERENCING TIME
9762 ms.

PEAK RAM USAGE
756.6K

FLASH USAGE
951.0K



- As illustrated in the initial graph, the model effectively differentiated between the presented objects, grouping them based on their distinctive characteristics. The second graph showcases 100% accuracy in discerning whether the objects are a fish or a guitar, with the fish positioned on one side and the guitar on the other. In the third graph, a perfect score of 1 is depicted, indicating the model's flawless ability to distinguish between the objects without any uncertainties noted in the test.
- Given that my model achieved the highest score, further enhancement could involve gaining a deeper understanding of the tested scenario. This understanding could be augmented by incorporating real-world knowledge or insights from external sources. Reflecting on the insights gained from the model testing, there is potential for improvement by expanding the scope of testing. This may include introducing additional objects or incorporating objects with more complex geometry. Exploring such avenues of inquiry can contribute to refining and advancing the capabilities of the model in future iterations.

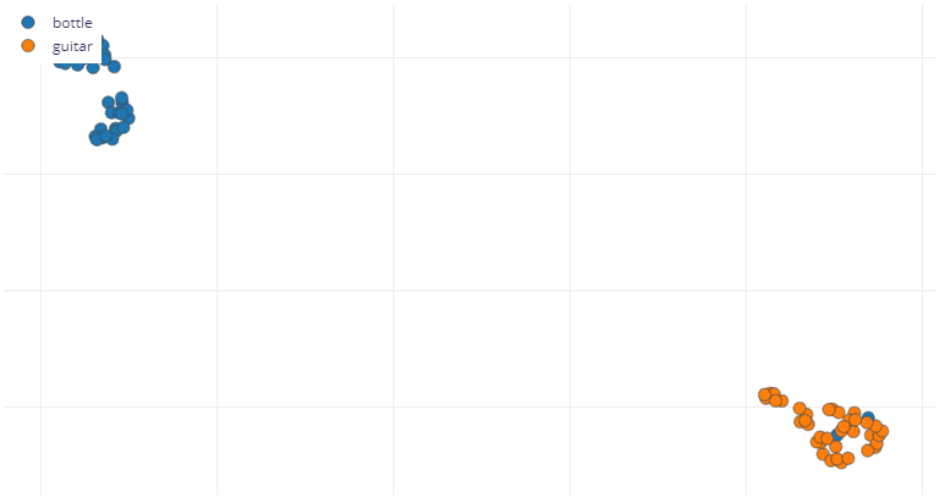
PART B: The construction of a model with one of your objects and one of someone else's objects:

- I utilized the same set of 50 images each for constructing this model, featuring a guitar and an unrelated object belonging to someone else; bottle. The selection of these two distinct objects for the second model was intentional, aiming to assess the model's ability to differentiate between objects with no apparent commonalities.


DASANI
100%
RECYCLED BOTTLE

- The assigned task involved working with two objects, one of our own and one from someone else, with the objective of creating a model that produces outcomes distinct from our initial model.

Feature explorer



On-device performance

PROCESSING TIME
1 ms.

PEAK RAM USAGE
4 KB

Model

Model version: Quantized (int8)

Last training performance (validation set)

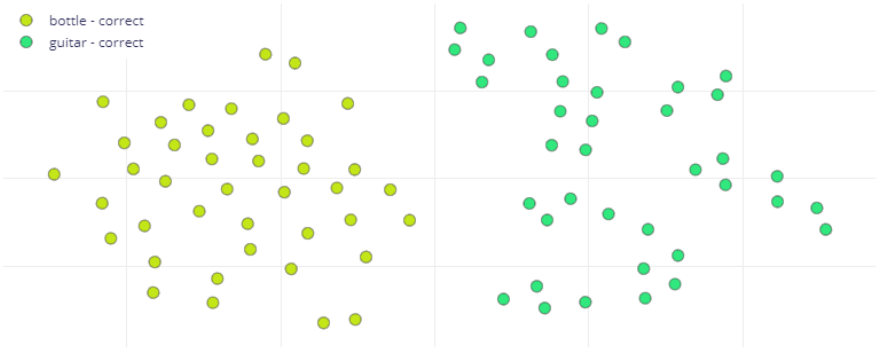
ACCURACY
100.0%

LOSS
0.00

Confusion matrix (validation set)

	BOTTLE	GUITAR
BOTTLE	100%	0%
GUITAR	0%	100%
F1 SCORE	1.00	1.00

Data explorer (full training set)



On-device performance

INFERENCING TIME
1353 ms.

PEAK RAM USAGE
1.5M

FLASH USAGE
2.5M

- In the initial graph, guitars were positioned in the top left, while the bottle occupied the bottom right, indicating a clear distinction between the two objects. However, there were instances where the model grouped two guitar images with the bottle, possibly suggesting a perceived resemblance. The second graph reveals a 100% accuracy in discerning between the two objects, with a noticeable separation. The third graph displays a score of 1, signifying the model's high confidence in distinguishing between the guitar and the bottle.
- The model exhibited consistent performance comparable to that in part A, maintaining the same level of accuracy across both instances. However, a noteworthy difference is evident in the initial graph, where the model incorrectly grouped two guitar images with the bottle. In contrast, the other model consistently grouped similar objects together in both parts.

PART C: Think of how to integrate this task:

- You live in a world of dreams where cutting-edge Object detection algorithms play a vital role in this universe.
  What: Anyone can deploy Object Detection to identify and interpret dreams that have occurred within the universe. This technology can be used to interpret dreams to understand what they truly mean in the dreaming world.
  Why: In this world, individuals use this technology for personal exploration within dreams and get a better grasp of the dream world. This technology also enhances those who use it to decipher the symbolism and emotions coming from those who dream.
  Where: This world is a world where diverse backgrounds come together to explore one's dreams.
  Whom: The Object Detection algorithms not only analyze individual dreams but also identify

common motifs, fostering a shared dreamscape where the collective imagination of the community converges.

- **Storyboard:**

- **Panel 1:** The narrator introduces the concept of the universe and the role of dreams in this universe.
- **Panel 2:** We get a zoomed in shot of what happens behind the scenes in this universe uncovering the advanced AI.
- **Panel 3:** We see that of a young boy going to sleep. We also then see another man watching over him with the object detection algorithm, hopeful to catch his dreams and study them.
- **Panel 4:** The object Detection Algorithm highlights each element in the boy's dream with careful precision.
- **Panel 5:** As the boy dreams, the Object Detection Algorithm provides information about the dreamer's emotional and symbolic significance of their dream.
- **Panel 6:** As the man studies the boys' dreams, he identifies common objects and themes, fostering a shared dreamscape.
- **Panel 7**: The boy continues to weave dreams, while the man continues to study his dreams, pushing the boundaries of what is possible in the dreaming world using the most advanced Object Detection Algorithm in the universe.