• Princess Chulabhorn Science High School Chonburi

DEVELOPING A MODEL FOR THE ACOUSTIC TYPE OF GRAND RECYCLING WASTE WITH LEARNING THAT CAN BE APPLIED

Chittiphat Lamdaun, Nontakon Prempree

Advisor:Kittitad ThongYam

PROBLEM

Global Waste Management Issues: Lack of Waste Separation in Thailand Affects Recycling The project uses Machine Learning to separate recyclable waste, reducing environmental impacts and increasing recycling efficiency.

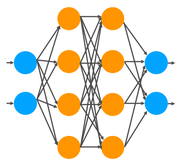
FRAMEWORK

Study and research related content

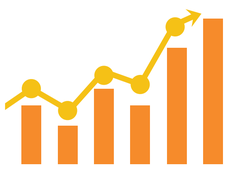
Record and label sound

Import audio files into Program

Convert sound to spectrogram

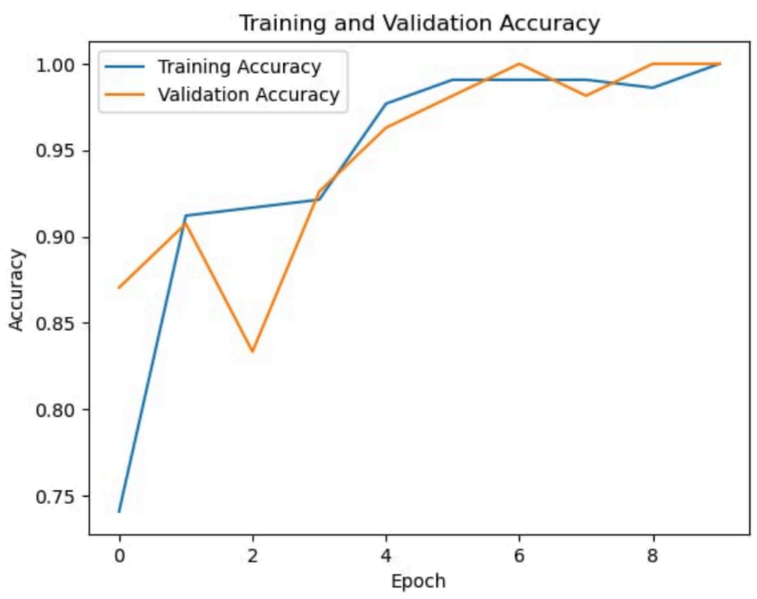


Build a central neural network model



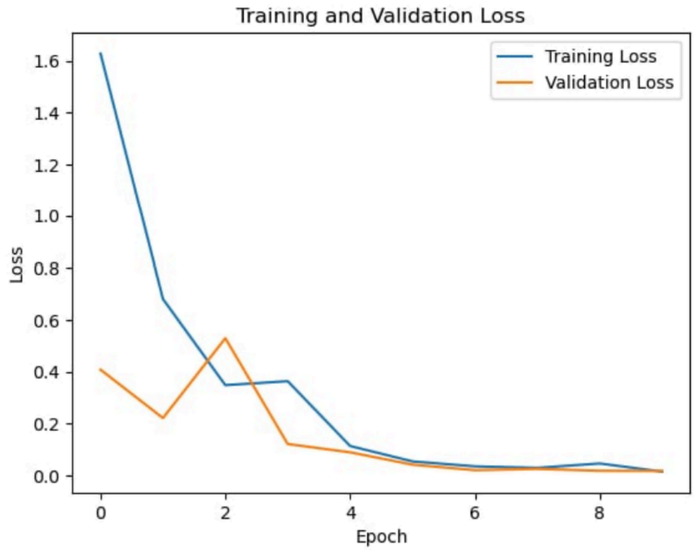
Create a graph comparing the accuracy and training loss.

FINDING



This graph shows the model's increasing accuracy for both training and validation sets, with both nearing 1.0, indicating effective learning. While there are occasional slight drops in validation accuracy, it ultimately aligns closely with the training accuracy.

FINDING(continue)



The graph shows that both training and validation losses decrease over time, indicating the model is learning well. Although the validation loss occasionally increases in some epochs, it ultimately converges with the training loss.

INTERPRETATION AND CONCLUSION

The development of a waste sound classification model using machine learning technology began with the preparation of a sound dataset consisting of 90 samples each for plastic bottles, cans, and glass bottles. The model was trained for 10 epochs, and initial performance testing showed promising results. The model was then tested 50 times for each waste type, and it was found that the model was most accurate in predicting the sound of plastic bottles, followed by cans and glass bottles, respectively. The overall accuracy of the model was 94%.

REFERENCE