Waste Classification

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Why waste classification?

To simplify image identification with a broad spectrum(i.e. Infinite types of waste) into binary classification.

Organic or Recyclable

With infinite type of waste, via Deep Learning, we can classify waste into Organic or Recyclable waste

Assumption:
DNN can predict/classify accurately images of waste

Limitation

Model is GPU accelerated/trained

Models

PC Specs for Deep Learning:
AMD Ryzen 2700X: 8-Core, 16-Thread
NVIDIA GTX 1080: 8GB VRAM, 2560 CUDA cores
64 GB RAM

2 Models with 1 transfer learning each

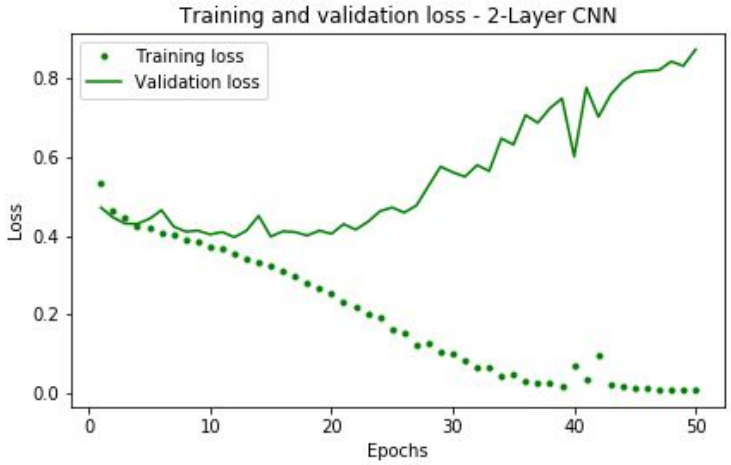
- 2 layer CNN
- 3 Layer CNN

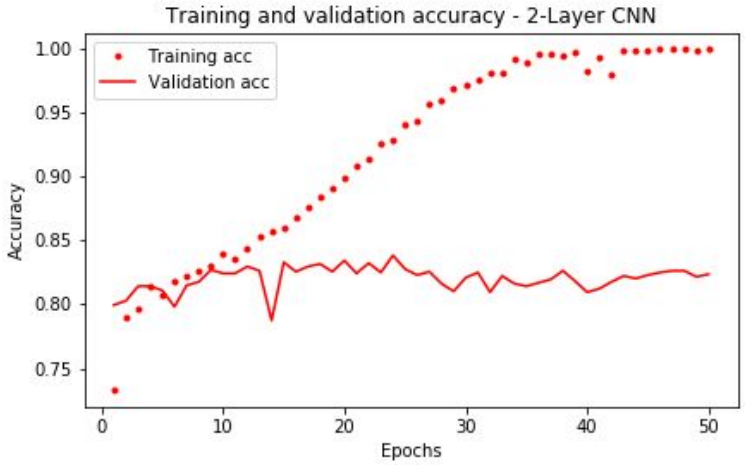
Model Results

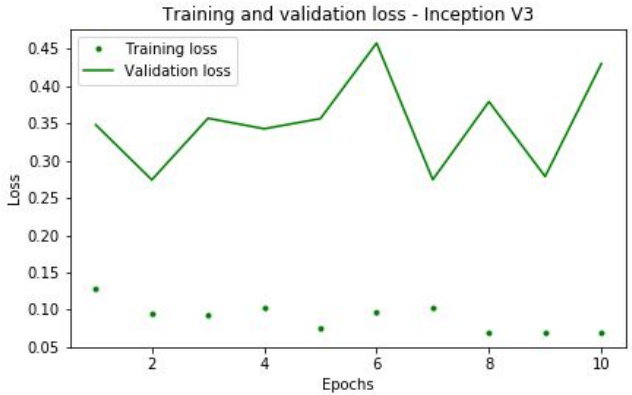
90+ Accuracy

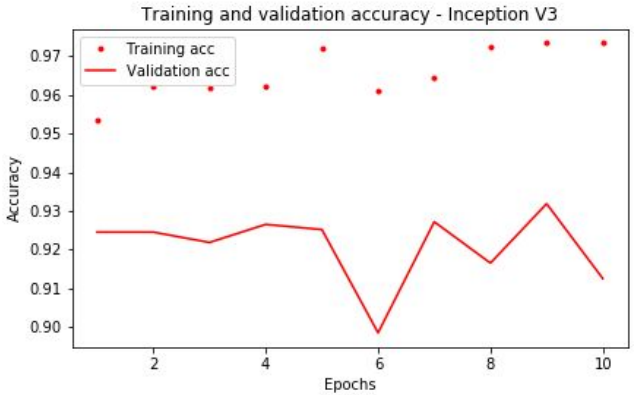
< 0.1 model loss

Model Results

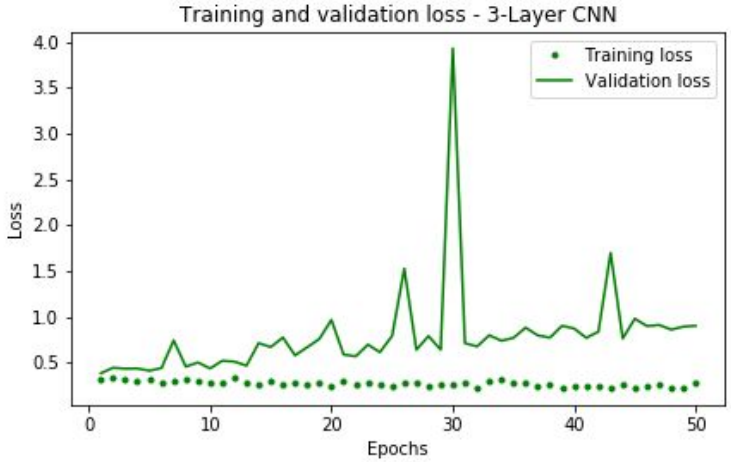


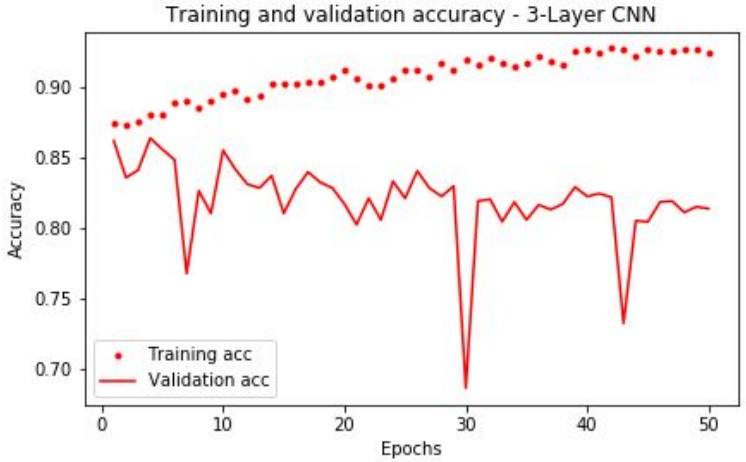


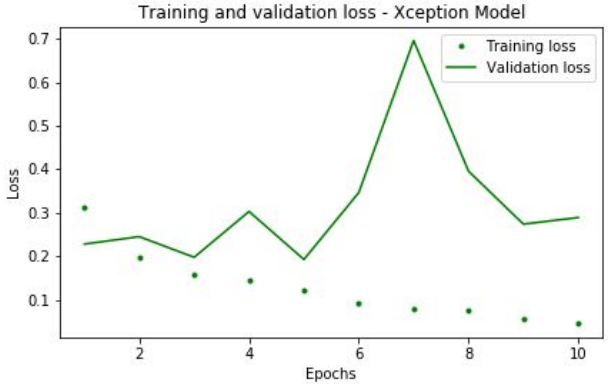


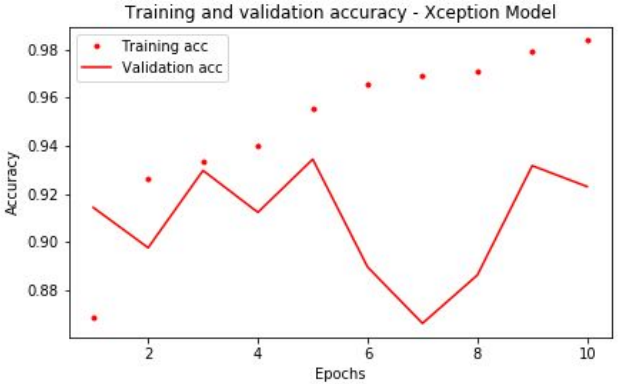


Model Results









Challenges:

The model is still confused with some images

1. Confusing images that resembles either organic or recyclable confused the model (i.e. a styrofoam ball)
2. Some images makes different models conflict each other (2-2 split or 3-1 in classifying images

90% is very acceptable!

Conclusion

All CNN models were performing at desirable and feasible rates. Model improvement and further complex classification should be considered on top of the working models i.e multiclass with multiple types (i.e. metal and recyclable, plant product and organic)

What will I do next?

Utilize deeper CNN and include confusing images with training the model

Utilize other Keras pre-trained application