Assignment 3 Part B

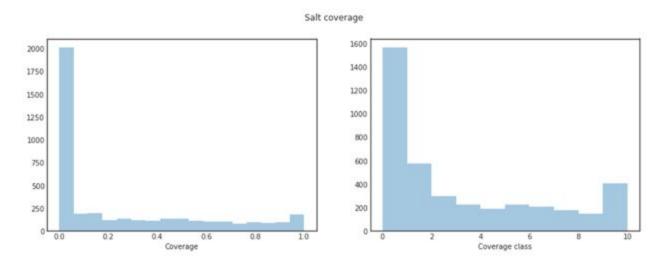
TGS Salt Identification Challenge

-Ayush Chaurasia, 2016MT10617 -Sarthak Vishnoi, 2016CS10336

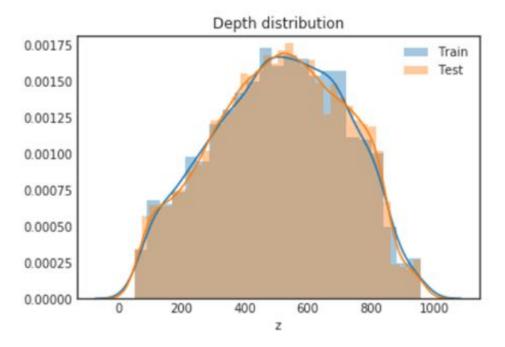
- 1. Used the method of UNet with simple ResNet blocks for solving the problem statement. The IoU (Intersection over Union) metric was used along with **lovasz loss** function for evaluation hence for accuracy calculation and early stopping decision taking.
- 2. Each run of the whole code took anywhere between 6 and 8 hours, so not many trials could be done. The final accuracy that we achieved on the public test dataset was 82.3% which is a lot of improvement from the first run we did in which we could only get an accuracy of 62.7%

Basic Pointers of the code

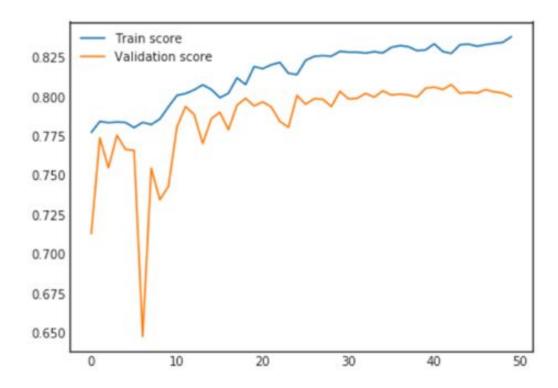
1. Firstly, we divided the images into various classes according to the amount of salt present in each of them. The plot corresponding to this is shown below.



2. Then we divided the images on the basis of their depth



3. Used the iou (intersection over union) metric for evaluation and hence for early stopping with the validation and training set. Validation set was produced based on coverage classes. The following graph shows the score on training data and validation data v/s number of epochs ran



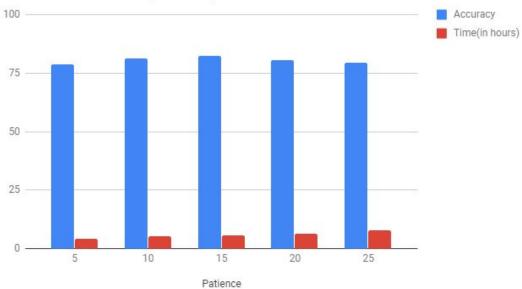
•

- 4. Early stopping criteria was set when the IoU metric didn't improve for a continuous of 15 runs. The number of epochs were kept maximum at 100 epochs. The total time taken to run the whole kernel was 5 hours and 50 minutes.
- 5. Changing the batch size results in the following trend. We chose the best batch size possible which was 128.



6. We kept the patience at 15, ie. if after 15 epochs the IoU metric doesn't improve it'll lead to early stopping. The trade-off in this was between accuracy and time taken to run the code. Smaller patience will lead to poor accuracy and less time, while larger accuracy will lead to higher accuracy or smaller accuracy due to overfitting and large time. The graph for the same is given below.

Accuracy and Time(in hours)



Thus, the observations which we got are listed above and hence we came up with the best architecture which gave us an accuracy of 82.3% on the public leaderboard.