**Task A:**

Implemented the PointNet architecture in the model.py file.

**Task B:**

Implemented the CorrNet architecture in the model.py file.

**Task C:**

Implemented the NTcrossentropy loss function in the train.py file.

**Task D:**

***For train\_corrmask = 0 and distance\_threshold = 0.01:***

Best model according to validation accuracy occurred at Epoch: 94, LR: 0.00100000, losses are as follows:

train\_loss: 1025.54915946. train\_acc: 0.59913747.

val\_loss: 1133.87621307. val\_acc: 0.56384957.

test\_loss: 1140.05135345. test\_acc: 0.52675712.

***For train\_corrmask = 0 and distance\_threshold = 0.02:***

Best model according to validation accuracy occurred at Epoch: 97, LR: 0.00100000, losses are as follows:

train\_loss: 930.43209185. train\_acc: 0.94144024.

val\_loss: 1084.11852264. val\_acc: 0.92445910.

test\_loss: 1179.56261444. test\_acc: 0.89423919.

***For train\_corrmask = 0 and distance\_threshold = 0.04:***

Best model according to validation accuracy occurred at Epoch: 51, LR: 0.00100000, losses are as follows:

train\_loss: 1105.07366616. train\_acc: 0.99809322.

val\_loss: 1222.20777130. val\_acc: 0.99764651.

test\_loss: 1316.02962494. test\_acc: 0.99124306.

***For train\_corrmask = 1 and distance\_threshold = 0.01:***

Best model according to validation accuracy occurred at Epoch: 87, LR: 0.00100000, losses are as follows:

Validation set: Average fitted rotation: [ 2.16989206 -2.08670042 -0.66719806]

Test set: Average fitted rotation: [ 2.2429322 1.2680177 -0.95615139]

train\_loss: 0.48254553. train\_acc: 0.76293430.

val\_loss: 0.51418624. val\_acc: 0.75582284.

test\_loss: 0.50977021. test\_acc: 0.76100135.

***For train\_corrmask = 1 and distance\_threshold = 0.02:***

Best model according to validation accuracy occurred at Epoch: 100, LR: 0.00100000, losses are as follows:

Validation set: Average fitted rotation: [ 1.48767515 -6.98372588 -0.76175351]

Test set: Average fitted rotation: [-0.29842349 -1.70647408 0.6873297 ]

train\_loss: 0.52223992. train\_acc: 0.74458625.

val\_loss: 0.53602837. val\_acc: 0.74381924.

test\_loss: 0.53404215. test\_acc: 0.74739879.

***For train\_corrmask = 1 and distance\_threshold = 0.04:***

Best model according to validation accuracy occurred at Epoch: 89, LR: 0.00100000, losses are as follows:

Validation set: Average fitted rotation: [ 3.33971124 -4.5137773 4.3871357 ]

Test set: Average fitted rotation: [1.21715224 0.99535642 2.26499862]

train\_loss: 0.53974576. train\_acc: 0.72567227.

val\_loss: 0.56495960. val\_acc: 0.72649384.

test\_loss: 0.55748304. test\_acc: 0.70353669.

**Task E:**

Implemented the fit\_rotation function in the train.py file.

***For distance\_threshold = 0.01:***

Best model according to validation accuracy occurred at Epoch: 87, LR: 0.00100000

3D rotation angles for the test set: [ 2.2429322 1.2680177 -0.95615139]

***For distance\_threshold = 0.02:***

Best model according to validation accuracy occurred at Epoch: 100, LR: 0.00100000

3D rotation angles for the test set: [-0.29842349 -1.70647408 0.6873297 ]

***For distance\_threshold = 0.04:***

Best model according to validation accuracy occurred at Epoch: 89, LR: 0.00100000

3D rotation angles for the test set: [1.21715224 0.99535642 2.26499862]