6DOF Homework

Problem 2

The experiments I have done and the validation metrics are shown below:

Experiment	Iteration	cls_accuracy	cls_R_accuracy	cls_t_accuracy	cls_R_t_acc
Basic Model	40000	0.540578	0.066025	0.298487	0.046768
Cropped Images as Input	46000	0.865199	0.496561	0.755158	0.442916
6D Rotation Representation & Loss	93000	0.466300	0.044017	0.287483	0.027510
Multiple Heads for Different Object Classes	47000	0.477304	0.160935	0.235213	0.071527
Ensemble of All Modifications	65000	0.723521	0.412655	0.316369	0.235213

My final model is the Cropped Images as Input one which comprises just the basic model architecture and the default training recipe and hyperparameters. The only modification I made is that I just cropped the input images to their boundng boxes.

Hyperparameter	Value	Description
`lr`	1e-4	Learning Rate
`weight_decay`	1e-4	Weight Decay for optimizer
`output_dir`	`runs/basic/`	Output Directory
`data_dir`	`data/ycbv/v1/`	Data Directory

Hyperparameter	Value	Description
`batch_size`	16	Batch Size
`seed`	2	Random seed
`max_iter`	100000	Total Iterations
`val_every`	1000	Iterations interval to validate
`save_every`	50000	Iterations interval to save model
`preload_images`	1	Whether to preload train and val images
`lr_step`	[60000, 80000]	Iterations to reduce learning rate

The plot validation metrics of my best model is shown below: