



# 6DOF Homework

## Problem 2

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

Experiment	Iteration	cls_accuracy	cls_R_t_accuracy	overall
Basic Model	40000	0.540578	0.046768	0.951857
Cropped Images as Input	46000	0.865199	0.442916	2.559835
6D Rotation Representation & Loss	93000	0.466300	0.027510	0.825309
Multiple Heads for Different Object Classes	47000	0.477304	0.071527	0.944979
Ensemble of All Modifications	65000	0.723521	0.235213	1.687758

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 bounding 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
batch_size	16	Batch Size
seed	2	Random seed

Hyperparameter	Value	Description
<code>max_iter</code>	100000	Total Iterations
<code>val_every</code>	1000	Iterations interval to validate
<code>save_every</code>	50000	Iterations interval to save model
<code>preload_images</code>	1	Whether to preload train and val images
<code>lr_step</code>	[60000, 80000]	Iterations to reduce learning rate

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

