

Regression													
Simple Fully Connected Model	LR: 1e-5 Epochs: 100	Weight Decay: 1e-5			CPU vs GPU (Extra Credit)	Speedup: 8.5X for 30 epochs of training							
Result (MSE)	a: 0.000468	b: 0.000459											
				Colorization				Transfer Learning					
Hyperparameter Tuning:	Can be done by monitoring validation loss or a simple grid search, we will be performing grid search								Epochs: 1000	LR: 1e-3	Weight Decay: 1e-5, Optimizer: Adam		
Three models: CNN1,2,3 (Different No Of Feature Maps)				Same Model Architecture but different activations						MSE Results			
Grid Search for Epochs: [100, 300, 500]	Learning Rates: [1e-3, 1e-4, 1e-5]	Weight Decay: Fixed at 1e-5	Adam Optimizer, MSE Loss, ReLU Activation	Grid Search for Epochs: [100, 300, 500]	Learning Rates: [1e-3, 1e-4, 1e-5]	Weight Decay: Fixed at 1e-5	Adam Optimizer, MSE Loss			Regression	a	b	
										ReLU	0.00134	0.00094	
										Tanh	0.00164	0.00098	
CNN1	Aggregate MSE Validation Losses of [a,b]			ReLU	PSNR						Colorization		
Epoch/LR	1.00E-03	1.00E-04	1.00E-05	Epoch/LR	1.00E-03	1.00E-04	1.00E-05				PSNR Results		
100	0.000196	0.000195	0.1877	100	34.5892	34.4374	34.46079				a	b	
300	0.000183	0.000197	0.1553	300	34.12332	34.6032	34.37195				SSIM Results		
500	0.000198	0.000196	0.14998	500	34.57603	34.59363	34.30788			Colorization	a	b	
										Sigmoid	22.97336	24.74351	
CNN2				Sigmoid						Tanh	24.7877	25.2298	
Epoch/LR	1.00E-03	1.00E-04	1.00E-05	Epoch/LR	1.00E-03	1.00E-04	1.00E-05				SSIM Results		
100	0.0001594	0.000128	0.000138	100	34.424	34.66826	33.6417			Colorization	a	b	
300	0.000135	0.000128	0.0001218	300	34.5579	34.67858	34.6108			Sigmoid	0.706159	0.80465	
500	0.0001313	0.000128	0.000108	500	34.62515	34.435	34.4634			Tanh	0.80334	0.83706	
											MSE Results		
CNN3				Tanh (Extra Credit)						Colorization	a	b	
Epoch/LR	1.00E-03	1.00E-04	1.00E-05	Epoch/LR	1.00E-03	1.00E-04	1.00E-05			Sigmoid	0.005042	0.003354	
100	0.000114	0.000109	0.000142	100	35.4374	35.5301	32.1824			Tanh	0.00332	0.00299	
300	0.000129	0.000109	0.000136	300	35.6492	35.3373	34.9099				Best Model and hyperparameters:		
500	0.0001108	0.000138	0.000135	500	35.75838	35.1595	34.8064				Result (MSE)		
											Result (PSNR)		
Best Model and hyperparameters:	Model: CNN2	LR: 1e-5 Epochs: 500 Weight Decay: 1e-5	This model and set of hyperparameters will be used for transfer learning	Best Model and hyperparameters:	Model: Sigmoid	LR: 1e-3 Epochs: 500 Weight Decay: 1e-5	This model and set of hyperparameters will be used for transfer learning				Result (MSE)		
Result (MSE)	a: 6.2262e-05	b: 0.000172		Result (PSNR)	a: 34.69402	b: 33.90814					Result (MSE)		
				Result (MSE)	a: 0.000339	b: 0.000406					Testing best model (CNN2) with Tanh (Extra Credit)		
Testing best model (CNN2) with Tanh (Extra Credit)	a: 4.40178e-05	b: 0.000129	Model: CNN2 LR: 1e-5 Epochs: 500 Weight Decay: 1e-5	Testing best model with Tanh (Extra Credit) (PSNR)	a: 36.5217	b: 34.1997	Model: Tanh LR: 1e-3 Epochs: 500 Weight Decay: 1e-5				Result (MSE)		
				Result (MSE)	a: 0.000222	b: 0.000380					Result (MSE)		