Additional results

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1 Introduction

This pdf shows additional results complementary to those presented in the main paper. We provide the results alongside with the topologies used to compute the tables in the experimental section appendix of the work. Tables below show performance over test set. Mixup coefficient for BIRDS, CARS and SVHN is selected with a validation and for CIFAR10 and CIFAR100 is taken from the original work. $\texttt{ARC}(x_1, x_2)$ means that the `ARC` loss is applied over x_1 and x_2 separately while $\texttt{ARC}(\tilde{x})$ indicates that is applied over the Mixup image. This simbol `X` indicates that M = 5-15-30. The results from table 5 in the main work has been computed using a densenet-121 without dropout, with $M = 1$ and $\texttt{V}_1$

2 CIFAR10

CIFAR 10 BASELINES

MODEL	Dropout	baseline		Mixup ($\gamma = 1$)	
		ACC	ECE	ACC	ECE
Densenet-121	0	95.35	2.97	96.55	3.44
Densenet-121	0.2	94.79	3.46	95.48	2.32
ResNet-101	0	94.51	3.92	96.11	3.46
ResNet-101	0.5	94.42	3.93	96.10	4.27
WideResNet-28x10	0	95.93	2.07	97.19	4.65
WideResNet-28x10	0.3	94.48	3.49	95.44	7.57
ResNet-18	0	94.46	3.49	95.66	4.66
ResNet-18	0.5	94.11	3.94	95.53	4.42

CIFAR10 ARC loss

		ARC			ARC +Mixup		
MODEL	Dropout	Hyperparameters	ACC	ECE	Hyperparameters	ACC	ECE
Densenet-121	0	$\mathtt{V}_1$ $M = 1$ $\beta = 1$	95.19	3.10	$\mathtt{V}_1$ $M = 1$ $\beta = 4$ $\mathtt{ARC}(x_1, x_2)$	96.06	1.59
Densenet-121	0.2	$\mathtt{V}_2$ $M = \mathtt{X}$ $\beta = 2$	94.71	3.40	$\mathtt{V}_1$ $M = 1$ $\beta = 2$ $\mathtt{ARC}(x_1, x_2)$	95.62	1.49
ResNet-101	0	$\mathtt{V}_1$ $M = 1$ $\beta = 1$	94.14	4.26	$\mathtt{V}_1$ $M = 1$ $\beta = 4$ $\mathtt{ARC}(x_1, x_2)$	95.94	0.98
ResNet-101	0.5	$\mathtt{V}_2$ $M = \mathtt{X}$ $\beta = 2$	94.53	3.90	$\mathtt{V}_1$ $M = 1$ $\beta = 2$ $\mathtt{ARC}(x_1, x_2)$	95.71	2.08
WideResNet-28x10	0	$\mathtt{V}_1$ $M = 1$ $\beta = 1$	95.99	2.01	$\mathtt{V}_1$ $M = 1$ $\beta = 4$ $\mathtt{ARC}(x_1, x_2)$	97.09	1.03
WideResNet-28x10	0.3	$\mathtt{V}_2$ $M = \mathtt{X}$ $\beta = 2$	95.35	2.99	$\mathtt{V}_1$ $M = 1$ $\beta = 2$ $\mathtt{ARC}(x_1, x_2)$	95.41	2.66
ResNet-18	0	$\mathtt{V}_1$ $M = 1$ $\beta = 1$	94.22	3.68	$\mathtt{V}_1$ $M = 1$ $\beta = 4$ $\mathtt{ARC}(x_1, x_2)$	95.60	2.05
ResNet-18	0.5	$\mathtt{V}_2$ $M = \mathtt{X}$ $\beta = 2$	94.43	3.61	$\mathtt{V}_1$ $M = 1$ $\beta = 2$ $\mathtt{ARC}(x_1, x_2)$	95.79	1.07

CIFAR10 MMCE loss

		MMCE			MMCE +Mixup		
MODEL	Dropout	Hyperparams	Accuracy	ECE	Hyperparams	Accuracy	ECE
Densenet-121	0	$\beta = 0.5$	93.72	2.38	$\beta = 0.4$ $\mathtt{MMCE}(x_1, x_2)$	95.97	3.61
Densenet-121	0.2	$\beta = 0.5$	93.54	1.44	$\beta = 0.4$ $\mathtt{MMCE}(x_1, x_2)$	92.56	7.32
ResNet-101	0	$\beta = 0.5$	93.54	2.99	$\beta = 0.4$ $\mathtt{MMCE}(x_1, x_2)$	95.94	1.42
ResNet-101	0.5	$\beta = 0.5$	93.94	2.97	$\beta = 0.4$ $\mathtt{MMCE}(x_1, x_2)$	93.70	6.72
WideResNet-28x10	0	$\beta = 0.5$	95.58	1.21	$\beta = 0.4$ $\mathtt{MMCE}(x_1, x_2)$	97.02	1.11
WideResNet-28x10	0.3	$\beta = 0.5$	94.98	1.71	$\beta = 0.4$ $\mathtt{MMCE}(x_1, x_2)$	90.04	13.44
ResNet-18	0	$\beta = 0.5$	94.38	2.41	$\beta = 0.4$ $\mathtt{MMCE}(x_1, x_2)$	95.50	1.53
ResNet-18	0.5	$\beta = 0.5$	94.21	2.29	$\beta = 0.4$ $\mathtt{MMCE}(x_1, x_2)$	74.48	10.36

74.480

CIFAR10 MCE (%)

Model	Dropout	Baseline	Baseline+Mixup	MMCE	MMCE +Mixup	ARC	ARC +Mixup
DenseNet-121	0.0	1.8	2.72	0.64	2.03	1.89	0.52
DenseNet-121	0.2	2.28	1.25	0.47	1.20	2.03	0.45
ResNet-101	0.0	2.66	2.44	1.74	0.56	2.94	0.26
ResNet-101	0.5	2.61	3.30	1.54	2.43	2.65	1.08
WideResNet-28x10	0.0	1.23	3.11	0.46	0.73	1.02	0.39
WideResNet-28x10	0.3	1.95	4.65	0.91	9.32	2.02	1.73
ResNet-18	0.0	2.26	2.98	1.34	0.23	2.12	1.52
ResNet-18	0.5	2.52	2.56	1.36	5.30	2.35	0.31

CIFAR10 BS $\times$ 100

Model	Dropout	Baseline	Baseline+Mixup	MMCE	MMCE +Mixup	ARC	ARC +Mixup
DenseNet-121	0.0	0.77	0.56	1.00	0.67	0.78	0.66
DenseNet-121	0.2	0.86	0.71	0.97	1.30	0.86	0.72
ResNet-101	0.0	0.92	0.63	1.00	0.65	0.98	0.66
ResNet-101	0.5	0.94	0.65	0.95	1.29	0.92	0.72
WideResNet-28x10	0.0	0.65	0.47	0.67	0.45	0.62	0.48
WideResNet-28x10	0.3	0.89	0.78	0.78	2.17	0.78	0.74
ResNet-18	0.0	0.91	0.69	0.87	0.70	0.93	0.70
ResNet-18	0.5	0.97	0.72	0.88	3.47	0.92	0.67

CIFAR10 NNL

Model	Dropout	Baseline	Baseline+Mixup	MMCE	MMCE +Mixup	ARC	ARC +Mixup
DenseNet-121	0.0	0.19	0.16	0.22	0.18	0.19	0.17
DenseNet-121	0.2	0.23	0.17	0.21	0.29	0.22	0.17
ResNet-101	0.0	0.27	0.17	0.26	0.16	0.31	0.17
ResNet-101	0.5	0.28	0.18	0.24	0.30	0.28	0.18
WideResNet-28x10	0.0	0.15	0.14	0.15	0.11	0.14	0.12
WideResNet-28x10	0.3	0.22	0.23	0.17	0.44	0.21	0.19
ResNet-18	0.0	0.25	0.19	0.22	0.16	0.24	0.17
ResNet-18	0.5	0.26	0.19	0.21	0.88	0.25	0.16

3 CIFAR100

CIFAR100

MODEL	Dropout	baseline		Mixup ($\gamma = 1$)	
		ACC	ECE	ACC	ECE
Densenet-121	0	79.13	9.02	81.49	3.13
Densenet-121	0.2	78.16	10.99	80.29	1.71
ResNet-101	0	77.40	12.17	81.17	3.63
ResNet-101	0.5	76.62	14.73	81.31	3.23
WideResNet-28x10	0	79.79	5.06	82.34	1.42
WideResNet-28x10	0.3	75.48	13.37	77.49	2.35
ResNet-18	0	74.19	13.08	78.00	10.33
ResNet-18	0.5	76.90	14.13	78.24	3.86

CIFAR100 ARC loss

		ARC			ARC +Mixup		
MODEL	Dropout	Hyperparameters	ACC	ECE	Hyperparameters	ACC	ECE
Densenet-121	0	$\mathtt{V}_2$ $M = 1$ $\beta = 0.5$	79.12	8.55	$\mathtt{V}_1$ $M = \mathtt{X}$ $\beta = 4.0$ $\mathtt{ARC}(x_1, x_2)$	81.24	3.47
Densenet-121	0.2	$\mathtt{V}_1$ $M = 15$ $\beta = 0.5$	77.67	11.76	$\mathtt{V}_1$ $M = 1$ $\beta = 8.0$ $\mathtt{ARC}(\tilde{x})$	79.73	2.33
ResNet-101	0	$\mathtt{V}_2$ $M = 1$ $\beta = 0.5$	77.82	12.66	$\mathtt{V}_1$ $M = 15$ $\beta = 4.0$ $\mathtt{ARC}(\tilde{x})$	80.16	2.71
ResNet-101	0.5	$\mathtt{V}_1$ $M = 15$ $\beta = 0.5$	77.39	12.83	$\mathtt{V}_1$ $M = 1$ $\beta = 8.0$ $\mathtt{ARC}(\tilde{x})$	79.93	3.83
WideResNet-28x10	0	$\mathtt{V}_2$ $M = 1$ $\beta = 0.5$	80.77	4.73	$\mathtt{V}_1$ $M = 15$ $\beta = 4.0$ $\mathtt{ARC}(\tilde{x})$	82.02	0.98
WideResNet-28x10	0.3	$\mathtt{V}_1$ $M = 15$ $\beta = 0.5$	75.51	13.23	$\mathtt{V}_1$ $M = 1$ $\beta = 8.0$ $\mathtt{ARC}(\tilde{x})$	79.43	1.56
ResNet-18	0	$\mathtt{V}_2$ $M = 1$ $\beta = 0.5$	74.30	13.30	$\mathtt{V}_1$ $M = \mathtt{X}$ $\beta = 1.0$ $\mathtt{ARC}(x_1, x_2)$	77.90	1.96
ResNet-18	0.5	$\mathtt{V}_1$ $M = 15$ $\beta = 0.5$	73.76	13.40	$\mathtt{V}_1$ $M = 1$ $\beta = 8.0$ $\mathtt{ARC}(\tilde{x})$	78.32	2.50

CIFAR100 MMCE loss

		MMCE			MMCE +Mixup		
MODEL	Dropout	Hyperparameters	ACC	ECE	Hyperparameters	ACC	ECE
Densenet-121	0	$\beta = 2.0$	73.02	6.41	$\beta = 0.4$ MMCE(x_1, x_2)	77.13	9.40
Densenet-121	0.2	$\beta = 2.0$	70.77	2.78	$\beta = 0.1$ MMCE(x_1, x_2)	80.04	3.23
ResNet-101	0	$\beta = 2.0$	73.14	2.53	$\beta = 0.4$ MMCE(x_1, x_2)	76.08	4.10
ResNet-101	0.5	$\beta = 2.0$	72.98	2.60	$\beta = 0.1$ MMCE(x_1, x_2)	80.65	7.84
WideResNet-28x10	0	$\beta = 2.0$	74.98	7.04	$\beta = 0.4$ MMCE(x_1, x_2)	81.31	4.46
WideResNet-28x10	0.3	$\beta = 2.0$	74.36	3.15	$\beta = 0.1$ MMCE(x_1, x_2)	77.23	5.81
ResNet-18	0	$\beta = 2.0$	70.77	2.38	$\beta = 0.4$ MMCE(x_1, x_2)	77.20	4.48
ResNet-18	0.5	$\beta = 2.0$	71.38	2.78	$\beta = 0.1$ MMCE(x_1, x_2)	78.51	4.52

CIFAR100 MCE (%)

Model	Dropout	Baseline	Baseline+Mixup	MMCE	MMCE +Mixup	ARC	ARC +Mixup
DenseNet-121	0.0	3.98	0.60	0.87	2.35	3.55	0.64
DenseNet-121	0.2	4.72	0.43	0.50	0.76	4.89	0.38
ResNet-101	0.0	5.33	0.57	0.47	0.69	5.79	0.69
ResNet-101	0.5	7.42	0.52	0.50	3.16	5.70	0.82
WideResNet-28x10	0.0	2.36	0.46	1.18	0.70	2.25	0.31
WideResNet-28x10	0.3	5.96	0.37	0.54	0.65	6.27	0.20
ResNet-18	0.0	4.97	1.47	0.40	0.53	5.07	0.47
ResNet-18	0.5	6.88	0.92	0.41	0.63	4.71	0.78

CIFAR100 BS $\times$ 100

Model	Dropout	Baseline	Baseline+Mixup	MMCE	MMCE +Mixup	ARC	ARC +Mixup
DenseNet-121	0.0	0.31	0.26	0.38	0.36	0.31	0.27
DenseNet-121	0.2	0.33	0.28	0.40	0.28	0.34	0.29
ResNet-101	0.0	0.35	0.27	0.37	0.33	0.35	0.29
ResNet-101	0.5	0.37	0.27	0.37	0.29	0.35	0.29
WideResNet-28x10	0.0	0.29	0.26	0.36	0.28	0.28	0.26
WideResNet-28x10	0.3	0.37	0.33	0.35	0.33	0.38	0.30
ResNet-18	0.0	0.39	0.33	0.40	0.32	0.39	0.31
ResNet-18	0.5	0.38	0.31	0.39	0.31	0.39	0.30

CIFAR100 (NNL)

Model	Dropout	Baseline	Baseline+Mixup	MMCE	MMCE +Mixup	ARC	ARC +Mixup
DenseNet-121	0.0	0.87	0.72	0.98	0.98	0.86	0.74
DenseNet-121	0.2	0.98	0.73	1.02	0.74	1.00	0.76
ResNet-101	0.0	1.07	0.73	0.95	0.94	1.11	0.80
ResNet-101	0.5	1.25	0.75	0.96	0.79	1.10	0.78
WideResNet-28x10	0.0	0.81	0.70	0.92	0.74	0.79	0.72
WideResNet-28x10	0.3	1.17	0.92	0.90	0.96	1.16	0.84
ResNet-18	0.0	1.20	0.93	1.06	0.87	1.20	0.88
ResNet-18	0.5	1.26	0.86	1.05	0.87	1.20	0.86

SVHN

MODEL	Dropout	baseline		Mixup ($\gamma = 0.6$)	
		ACC	ECE	ACC	ECE
Densenet-121	0	96.63	2.31	96.79	6.65
Densenet-121	0.2	96.59	2.60	96.75	1.52
ResNet-101	0	96.27	2.30	96.68	2.30
ResNet-101	0.5	96.20	2.33	96.39	4.78
WideResNet-16x8	0	96.64	0.62	96.97	4.91
WideResNet-16x8	0.3	97.07	0.50	96.38	12.72
ResNet-18	0	95.73	2.16	95.65	3.95
ResNet-18	0.5	95.47	2.33	95.66	3.18

SVHN ARC loss

		ARC			ARC +Mixup		
MODEL	Dropout	Hyperparameters	ACC	ECE	Hyperparameters	ACC	ECE
Densenet-121	0	$\mathtt{V}_1$ $M = 1$ $\beta = 1.0$	96.69	2.21	$\mathtt{V}_1$ $M = 15$ $\beta = 16$ $\mathtt{ARC}(x_1, x_2)$	96.82	2.20
Densenet-121	0.2	$\mathtt{V}_1$ $M = 1$ $\beta = 1.0$	96.56	2.20	$\mathtt{V}_1$ $M = \mathtt{X}$ $\beta = 1$ $\mathtt{ARC}(x_1, x_2)$	96.62	0.84
ResNet-101	0	$\mathtt{V}_1$ $M = 1$ $\beta = 1.0$	96.27	2.32	$\mathtt{V}_1$ $M = 15$ $\beta = 16$ $\mathtt{ARC}(x_1, x_2)$	96.23	2.05
ResNet-101	0.5	$\mathtt{V}_1$ $M = 1$ $\beta = 1.0$	95.96	2.56	$\mathtt{V}_1$ $M = \mathtt{X}$ $\beta = 1$ $\mathtt{ARC}(x_1, x_2)$	96.67	1.49
WideResNet-16x8	0	$\mathtt{V}_1$ $M = 1$ $\beta = 1.0$	96.60	0.61	$\mathtt{V}_1$ $M = 1$ $\beta = 20$ $\mathtt{ARC}(x_1, x_2)$	96.55	0.82
WideResNet-16x8	0.3	$\mathtt{V}_1$ $M = 1$ $\beta = 1.0$	97.08	0.37	$\mathtt{V}_1$ $M = \mathtt{X}$ $\beta = 1$ $\mathtt{ARC}(x_1, x_2)$	94.74	6.75
ResNet-18	0	$\mathtt{V}_1$ $M = 1$ $\beta = 1.0$	95.52	2.35	$\mathtt{V}_1$ $M = 15$ $\beta = 16$ $\mathtt{ARC}(x_1, x_2)$	95.50	1.80
ResNet-18	0.5	$\mathtt{V}_1$ $M = 1$ $\beta = 1.0$	95.44	2.35	$\mathtt{V}_1$ $M = \mathtt{X}$ $\beta = 1$ $\mathtt{ARC}(x_1, x_2)$	95.06	1.41

SVHN MMCE loss

		MMCE			MMCE +Mixup		
MODEL	Dropout	Hyperparameters	ACC	ECE	Hyperparameters	ACC	ECE
Densenet-121	0	$\beta = 0.1$	96.65	1.76	$\beta = 0.3$ MMCE(x_1, x_2)	96.01	4.43
Densenet-121	0.2	$\beta = 0.1$	96.58	2.29	$\beta = 0.2$ MMCE(x_1, x_2)	96.46	5.15
ResNet-101	0	$\beta = 0.1$	96.10	2.36	$\beta = 0.3$ MMCE(x_1, x_2)	96.73	3.05
ResNet-101	0.5	$\beta = 0.1$	96.38	2.15	$\beta = 0.2$ MMCE(x_1, x_2)	96.79	1.71
WideResNet-16x8	0	$\beta = 0.1$	96.65	0.49	$\beta = 0.3$ MMCE(x_1, x_2)	96.85	2.06
WideResNet-16x8	0.3	$\beta = 0.1$	96.90	0.49	$\beta = 0.2$ MMCE(x_1, x_2)	97.17	3.69
ResNet-18	0	$\beta = 0.1$	95.45	2.37	$\beta = 0.3$ MMCE(x_1, x_2)	96.45	1.75
ResNet-18	0.5	$\beta = 0.1$	95.49	2.33	$\beta = 0.2$ MMCE(x_1, x_2)	96.24	0.85

SVHN MCE (%)

Model	Dropout	Baseline	Baseline+Mixup	MMCE	MMCE +Mixup	ARC	ARC +Mixup
DenseNet-121	0.0	6.66	4.23	1.07	2.41	1.54	1.75
DenseNet-121	0.2	1.91	0.83	1.52	1.37	1.48	0.27
ResNet-101	0.0	1.56	1.58	1.48	2.42	1.52	1.47
ResNet-101	0.5	1.55	3.63	1.46	1.10	1.58	1.03
WideResNet-16x8	0.0	0.31	2.55	0.25	1.18	0.32	0.44
WideResNet-16x8	0.3	0.18	3.24	0.34	1.36	0.17	1.35
ResNet-18	0.0	1.33	3.41	1.39	1.44	1.34	1.52
ResNet-18	0.5	1.35	2.58	1.43	0.42	1.36	1.08

SVHN BS $\times$ 100

Model	dropout	Baseline	Baseline+Mixup	MMCE	MMCE +Mixup	ARC	ARC +Mixup
DenseNet-121	0.0	0.59	0.57	0.55	0.70	0.57	0.51
DenseNet-121	0.2	0.60	0.55	0.59	0.76	0.59	0.57
ResNet-101	0.0	0.64	0.55	0.65	0.54	0.63	0.59
ResNet-101	0.5	0.64	0.60	0.61	0.53	0.67	0.52
WideResNet-16x8	0.0	0.54	0.53	0.53	0.51	0.55	0.54
WideResNet-16x8	0.3	0.48	0.85	0.49	0.50	0.47	0.90
ResNet-18	0.0	0.70	0.70	0.74	0.57	0.72	0.68
ResNet-18	0.5	0.73	0.66	0.73	0.59	0.73	0.77

SVHN NNL

Model	Dropout	Baseline	Baseline+Mixup	MMCE	MMCE +Mixup	ARC	ARC +Mixup
DenseNet-121	0.0	0.17	0.18	0.15	0.20	0.16	0.14
DenseNet-121	0.2	0.20	0.15	0.18	0.21	0.17	0.15
ResNet-101	0.0	0.18	0.15	0.19	0.15	0.18	0.15
ResNet-101	0.5	0.18	0.18	0.18	0.14	0.19	0.14
WideResNet-16x8	0.0	0.13	0.16	0.13	0.13	0.14	0.14
WideResNet-16x8	0.3	0.12	0.26	0.13	0.14	0.12	0.23
ResNet-18	0.0	0.19	0.20	0.21	0.15	0.20	0.17
ResNet-18	0.5	0.20	0.18	0.20	0.15	0.20	0.19

BIRDS

MODEL	Dropout	baseline		Mixup ($\gamma = 0.4$)	
		ACC	ECE	ACC	ECE
Densenet-121	0	78.72	2.17	79.96	15.97
Densenet-121	0.2	79.74	1.62	80.91	14.11
ResNet-101	0	79.84	2.51	80.88	11.83
ResNet-101	0.5	80.31	4.34	82.09	10.14
ResNet-50	0	78.50	1.94	79.53	15.05
ResNet-50	0.5	79.44	2.64	80.55	13.10
ResNet-18	0	74.42	2.15	75.56	16.74
ResNet-18	0.5	77.13	1.77	77.60	16.90

BIRDS

		ARC			ARC +Mixup		
MODEL	Dropout	Hyperparameters	ACC	ECE	Hyperparameters	ACC	ECE
Densenet-121	0	$\mathtt{V}_1$ $M = 15$ $\beta = 0.5$	78.81	2.14	$\mathtt{V}_1$ $M = \mathtt{X}$ $\beta = 30$ $\mathtt{ARC}(\tilde{x})$	79.01	11.60
Densenet-121	0.2	$\mathtt{V}_1$ $M = 15$ $\beta = 0.5$	79.76	2.11	$\mathtt{V}_2$ $M = 15$ $\beta = 20$ $\mathtt{ARC}(\tilde{x})$	81.00	9.80
ResNet-101	0	$\mathtt{V}_1$ $M = 15$ $\beta = 0.5$	79.67	3.12	$\mathtt{V}_1$ $M = \mathtt{X}$ $\beta = 30$ $\mathtt{ARC}(\tilde{x})$	81.48	4.18
ResNet-101	0.5	$\mathtt{V}_1$ $M = 15$ $\beta = 0.5$	80.32	4.44	$\mathtt{V}_2$ $M = 15$ $\beta = 20$ $\mathtt{ARC}(\tilde{x})$	82.45	1.28
ResNet-50	0	$\mathtt{V}_1$ $M = 15$ $\beta = 0.5$	78.46	2.05	$\mathtt{V}_1$ $M = \mathtt{X}$ $\beta = 30$ $\mathtt{ARC}(\tilde{x})$	79.41	4.50
ResNet-50	0.5	$\mathtt{V}_1$ $M = 15$ $\beta = 0.5$	79.62	3.04	$\mathtt{V}_2$ $M = 15$ $\beta = 20$ $\mathtt{ARC}(\tilde{x})$	81.08	1.60
ResNet-18	0	$\mathtt{V}_1$ $M = 15$ $\beta = 0.5$	74.34	2.67	$\mathtt{V}_1$ $M = \mathtt{X}$ $\beta = 30$ $\mathtt{ARC}(\tilde{x})$	75.41	3.11
ResNet-18	0.5	$\mathtt{V}_1$ $M = 15$ $\beta = 0.5$	77.22	2.05	$\mathtt{V}_2$ $M = 15$ $\beta = 20$ $\mathtt{ARC}(\tilde{x})$	78.08	3.50

BIRDS

		MMCE			MMCE +Mixup		
MODEL	Dropout	Hyperparameters	ACC	ECE	Hyperparameters	ACC	ECE
Densenet-121	0	$\beta = 0.5$	79.55	1.72	$\beta = 0.3$ MMCE(x_1, x_2)	80.70	12.05
Densenet-121	0.2	$\beta = 0.5$	79.98	1.83	$\beta = 0.5$ MMCE(x_1, x_2)	81.41	11.35
ResNet-101	0	$\beta = 0.5$	80.00	2.18	$\beta = 0.3$ MMCE(x_1, x_2)	81.81	10.41
ResNet-101	0.5	$\beta = 0.5$	80.64	3.28	$\beta = 0.5$ MMCE(x_1, x_2)	82.41	10.93
ResNet-50	0	$\beta = 0.5$	78.88	1.71	$\beta = 0.3$ MMCE(x_1, x_2)	80.15	11.97
ResNet-50	0.5	$\beta = 0.5$	79.63	1.91	$\beta = 0.5$ MMCE(x_1, x_2)	80.83	12.95
ResNet-18	0	$\beta = 0.5$	74.41	1.45	$\beta = 0.3$ MMCE(x_1, x_2)	75.27	14.92
ResNet-18	0.5	$\beta = 0.5$	77.13	1.53	$\beta = 0.5$ MMCE(x_1, x_2)	77.36	14.35

BIRDS MCE (%)

Model	Dropout	Baseline	Baseline+Mixup	MMCE	MMCE +Mixup	ARC	ARC +Mixup
DenseNet-121	0.0	0.39	1.61	0.38	1.09	0.35	1.20
DenseNet-121	0.2	0.52	1.41	0.48	1.06	0.67	1.07
ResNet-101	0.0	0.60	1.44	0.35	1.10	0.69	0.67
ResNet-101	0.5	1.01	1.12	0.99	1.05	1.17	0.34
ResNet-50	0.0	0.46	1.49	0.34	1.21	0.62	0.66
ResNet-50	0.5	0.95	1.31	0.60	1.33	1.00	0.29
ResNet-18	0.0	0.37	1.76	0.25	1.57	0.41	0.41
ResNet-18	0.5	0.36	1.77	0.27	1.43	0.31	0.59

BIRDS BS $\times$ 100

Model	Dropout	Baseline	Baseline+Mixup	MMCE	MMCE +Mixup	ARC	ARC +Mixup
DenseNet-121	0.0	0.17	0.18	0.16	0.17	0.17	0.16
DenseNet-121	0.2	0.16	0.17	0.16	0.16	0.16	0.15
ResNet-101	0.0	0.16	0.16	0.16	0.15	0.16	0.14
ResNet-101	0.5	0.16	0.15	0.16	0.15	0.16	0.13
ResNet-50	0.0	0.17	0.18	0.17	0.17	0.17	0.15
ResNet-50	0.5	0.16	0.17	0.16	0.16	0.16	0.14
ResNet-18	0.0	0.19	0.21	0.19	0.20	0.19	0.17
ResNet-18	0.5	0.18	0.19	0.17	0.19	0.18	0.15

BIRDS NNL

Model	Dropout	Baseline	Baseline+Mixup	MMCE	MMCE +Mixup	ARC	ARC +Mixup
DenseNet-121	0.0	1.03	1.14	1.01	1.06	1.03	0.91
DenseNet-121	0.2	0.99	1.06	0.98	1.01	1.00	0.82
ResNet-101	0.0	1.00	1.03	0.98	0.98	1.00	0.75
ResNet-101	0.5	0.98	0.97	0.97	0.96	0.99	0.69
ResNet-50	0.0	1.04	1.13	1.02	1.06	1.05	0.84
ResNet-50	0.5	1.02	1.05	1.00	1.04	1.02	0.75
ResNet-18	0.0	1.17	1.29	1.15	1.27	1.17	0.96
ResNet-18	0.5	1.06	1.18	1.04	1.16	1.08	0.82

CARS

MODEL	Dropout	baseline		Mixup ($\gamma = 0.4$)	
		ACC	ECE	ACC	ECE
Densenet-121	0	88.24	4.04	88.12	20.00
Densenet-121	0.2	89.13	2.57	89.45	18.10
ResNet-101	0	87.45	1.67	87.75	17.34
ResNet-101	0.5	88.02	2.12	88.93	14.42
ResNet-50	0	85.98	1.68	86.35	19.90
ResNet-50	0.5	87.07	1.75	87.54	16.65
ResNet-18	0	82.73	1.71	81.72	19.60
ResNet-18	0.5	85.26	0.98	83.52	19.07

CARS

		ARC			ARC +Mixup		
MODEL	Dropout	Hyperparameters	ACC	ECE	Hyperparameters	ACC	ECE
Densenet-121	0	$\texttt{V}_1$ $M = 15$ $\beta = 10$	89.06	2.62	$\texttt{V}_2$ $M = \texttt{X}$ $\beta = 46$ $\texttt{ARC}(x_1, x_2)$	90.14	2.56
Densenet-121	0.2	$\texttt{V}_2$ $M = 1$ $\beta = 10$	90.09	1.92	$\texttt{V}_2$ $M = \texttt{X}$ $\beta = 28$ $\texttt{ARC}(x_1, x_2)$	91.13	2.40
ResNet-101	0	$\texttt{V}_1$ $M = 15$ $\beta = 10$	88.39	2.90	$\texttt{V}_1$ $M = \texttt{X}$ $\beta = 46$ $\texttt{ARC}(x_1, x_2)$	90.30	2.13
ResNet-101	0.5	$\texttt{V}_2$ $M = 1$ $\beta = 10$	89.11	4.15	$\texttt{V}_2$ $M = \texttt{X}$ $\beta = 28$ $\texttt{ARC}(x_1, x_2)$	90.97	2.87
ResNet-50	0	$\texttt{V}_1$ $M = 15$ $\beta = 10$	87.61	2.57	$\texttt{V}_2$ $M = \texttt{X}$ $\beta = 46$ $\texttt{ARC}(x_1, x_2)$	89.77	3.78
ResNet-50	0.5	$\texttt{V}_2$ $M = 1$ $\beta = 10$	88.02	3.71	$\texttt{V}_2$ $M = \texttt{X}$ $\beta = 28$ $\texttt{ARC}(x_1, x_2)$	90.11	3.84
ResNet-18	0	$\texttt{V}_1$ $M = 15$ $\beta = 10$	84.79	2.40	$\texttt{V}_2$ $M = \texttt{X}$ $\beta = 46$ $\texttt{ARC}(x_1, x_2)$	86.15	2.73
ResNet-18	0.5	$\texttt{V}_2$ $M = 1$ $\beta = 10$	85.18	1.84	$\texttt{V}_2$ $M = \texttt{X}$ $\beta = 28$ $\texttt{ARC}(x_1, x_2)$	88.45	2.38

CARS

		MMCE			MMCE +Mixup		
MODEL	Dropout	Hyperparameters	ACC	ECE	Hyperparameters	ACC	ECE
Densenet-121	0	$\beta = 0.5$	88.29	3.96	$\beta = 2.0$ MMCE(x_1, x_2)	88.47	11.56
Densenet-121	0.2	$\beta = 0.5$	89.40	2.70	$\beta = 2.0$ MMCE(x_1, x_2)	88.43	12.64
ResNet-101	0	$\beta = 0.5$	87.15	1.41	$\beta = 2.0$ MMCE(x_1, x_2)	87.23	13.82
ResNet-101	0.5	$\beta = 0.5$	88.15	2.04	$\beta = 2.0$ MMCE(x_1, x_2)	87.24	12.34
ResNet-50	0	$\beta = 0.5$	86.26	1.90	$\beta = 2.0$ MMCE(x_1, x_2)	86.20	14.25
ResNet-50	0.5	$\beta = 0.5$	87.18	1.50	$\beta = 2.0$ MMCE(x_1, x_2)	86.18	12.62
ResNet-18	0	$\beta = 0.5$	82.98	2.19	$\beta = 2.0$ MMCE(x_1, x_2)	81.30	13.94
ResNet-18	0.5	$\beta = 0.5$	85.28	2.12	$\beta = 2.0$ MMCE(x_1, x_2)	83.22	13.37

CARS MCE (%)

Model	Dropout	Baseline	Baseline+Mixup	MMCE	MMCE +Mixup	ARC	ARC +Mixup
DenseNet-121	0.0	0.58	1.98	0.52	1.12	0.82	0.91
DenseNet-121	0.2	0.42	1.84	0.35	1.14	1.21	1.64
ResNet-101	0.0	0.75	1.69	0.81	1.35	1.72	1.45
ResNet-101	0.5	1.08	1.45	1.29	1.23	2.15	1.87
ResNet-50	0.0	0.39	1.98	0.34	1.30	1.42	2.46
ResNet-50	0.5	0.71	1.61	0.73	1.18	1.74	2.50
ResNet-18	0.0	0.32	2.13	0.35	1.62	1.24	1.22
ResNet-18	0.5	0.23	1.79	0.33	1.32	0.27	1.54

CARS BS $\times$ 100

Model	Dropout	Baseline	Baseline+Mixup	MMCE	MMCE +Mixup	ARC	ARC +Mixup
DenseNet-121	0.0	0.097	0.125	0.096	0.105	0.091	0.078
DenseNet-121	0.2	0.089	0.110	0.087	0.105	0.080	0.069
ResNet-101	0.0	0.099	0.119	0.099	0.115	0.091	0.074
ResNet-101	0.5	0.093	0.105	0.092	0.112	0.089	0.071
ResNet-50	0.0	0.108	0.136	0.106	0.124	0.097	0.080
ResNet-50	0.5	0.100	0.120	0.099	0.120	0.094	0.079
ResNet-18	0.0	0.130	0.166	0.130	0.157	0.117	0.107
ResNet-18	0.5	0.109	0.150	0.109	0.140	0.112	0.087

CARS NNL

Model	dropout	Baseline	Baseline+Mixup	MMCE	MMCE +Mixup	ARC	ARC +Mixup
DenseNet-121	0.0	0.49	0.70	0.49	0.59	0.47	0.42
DenseNet-121	0.2	0.45	0.61	0.44	0.59	0.42	0.38
ResNet-101	0.0	0.50	0.66	0.50	0.63	0.49	0.38
ResNet-101	0.5	0.48	0.58	0.48	0.60	0.49	0.41
ResNet-50	0.0	0.54	0.75	0.53	0.68	0.51	0.45
ResNet-50	0.5	0.50	0.65	0.50	0.64	0.50	0.46
ResNet-18	0.0	0.66	0.91	0.66	0.86	0.61	0.58
ResNet-18	0.5	0.54	0.80	0.54	0.75	0.56	0.45