

German Dataset

Data Attributes	
# of data points	1000
Public Label	0 = 1 1 = 2
Sensitive Label	
# of numerical and label features	(1000, 13)
# of one hot encoding features	(1000, 50)
Clean data shape	(1000, 63)
Public label statistics	30.0 percent is 1
Sensitive label statistics	69.0 percent is 1

Represent.		X		Encoder		
		Predictor	Discriminator	Predictor	Discriminator	NMT
Architecture		One-layer NN	One-layer NN	One-Layer NN		
Hyper param.				representation_size = 100		
		batch_size = 60 epochs = 25 learning_rate = 0.01 hidden_size = 100 gamma = 1.0 weight = [0.3,0.7]	batch_size = 60 epochs = 25 learning_rate = 0.01 hidden_size = 100 gamma = 1.0 weight = [0.3,0.7]	batch_size = 60 epochs = 25 learning_rate = 0.01 hidden_size = 100 gamma = 1.0 weight = [0.3,0.7]	batch_size = 60 epochs = 25 learning_rate = 0.01 hidden_size = 100 gamma = 1.0 weight = [0.3,0.7]	batch_size = 60 epochs = 25 learning_rate = 0.01 hidden_size = 100 gamma = 1.0 weight = [0.3,0.7]
Test Acc.	Pred.	0.762		0.768		0.759
	Disc.		0.621		0.626	0.411 (0.32, 0.67)
Represent.		X		Encoder		
		Predictor	Discriminator	Predictor	Discriminator	NMT
Architecture		One-layer NN	Three-layer NN	One-Layer NN		
Hyper param.				representation_size = 64		
		batch_size = 16 epochs = 20 learning_rate = 0.001 hidden_size = 64 gamma = 1.0 weight = 0	batch_size = 16 epochs = 20 learning_rate = 0.001 hidden_size = 64 gamma = 1.0 weight = 0	batch_size = 16 epochs = 20 learning_rate = 0.001 hidden_size = 64 gamma = 1.0 weight = 0	batch_size = 16 epochs = 10 learning_rate = 0.001 hidden_size = 60 gamma = 1.0 weight = 0	batch_size = 60 epochs = 25 learning_rate = 0.01 hidden_size = 100 gamma = 1.0 weight = [0.3,0.7]
Test Acc.	Pred.	0.75		0.732		0.718
	Disc.		0.652		0.626	0.616

Represent.		X		Encoder		
		Predictor	Discriminator	Predictor	Discriminator	NMT
Architecture		One-layer NN	One-layer NN	One-Layer NN		
Hyper param.		batch_size = 60 epochs = 25 learning_rate = 0.01 hidden_size = 100 gamma = 1.0 weight = [0.3,0.7]	batch_size = 60 epochs = 25 learning_rate = 0.01 hidden_size = 100 gamma = 1.0 weight = [0.3,0.7]	representation_size = 100		
				batch_size = 60 epochs = 25 learning_rate = 0.01 hidden_size = 100 gamma = 1.0 weight = [0.3,0.7]	batch_size = 60 epochs = 25 learning_rate = 0.01 hidden_size = 100 gamma = 1.0 weight = [0.3,0.7]	batch_size = 60 epochs = 25 learning_rate = 0.01 hidden_size = 100 gamma = 1.0 weight = [0.3,0.7]
Test Acc.	Pred.	0.762		0.768		0.759
	Disc.		0.621		0.626	0.411 (0.32, 0.67)
Represent.		X		Encoder		
		Predictor	Discriminator	Predictor	Discriminator	NMT
Architecture		One-layer NN	One-layer NN	One-Layer NN		
Hyper param.		batch_size = 60 epochs = 25 learning_rate = 0.01 hidden_size = 100 gamma = 1.0 weight = [0.3,0.7]	batch_size = 60 epochs = 25 learning_rate = 0.01 hidden_size = 100 gamma = 1.0 weight = [0.3,0.7]	representation_size = 100		
				batch_size = 60 epochs = 25 learning_rate = 0.01 hidden_size = 100 gamma = 1.0 weight = [0.3,0.7]	batch_size = 60 epochs = 25 learning_rate = 0.01 hidden_size = 100 gamma = 1.0 weight = [0.3,0.7]	batch_size = 60 epochs = 25 learning_rate = 0.01 hidden_size = 100 gamma = 1.0 weight = [0.3,0.7]
Test Acc.	Pred.	0.762		0.768		0.759
	Disc.		0.621		0.626	0.411 (0.32, 0.67)
Represent.		X		Encoder		
		Predictor	Discriminator	Predictor	Discriminator	NMT
Architecture						
Hyper param.						
Test Acc.	Pred.					
	Disc.					
Represent.		X		Encoder		
		Predictor	Discriminator	Predictor	Discriminator	NMT
Architecture						
Hyper param.						
Test Acc.	Pred.					
	Disc.					

Adult Dataset

Data Attributes	
# of data points	32561
Public Label (index = 14)	0 = <=50K 1 = >50K
Sensitive Label (index = 9)	0 = Male 1 = Female
# of numerical and label features	(1000, 6)
# of one hot encoding features	(1000, 100)
Clean data shape	(1000, 106)
Public label statistics	24.08 percent is 1
Sensitive label statistics	33.08 percent is 1

Biased Dataset

Represent.		X		Encoder		
		Predictor	Discriminator	Predictor	Discriminator	NMT
Architecture		One-layer NN	One-layer NN	One-Layer NN		
Hyper param.		batch_size = 500 epochs = 20 learning_rate = 0.001 hidden_size = 100 gamma = 1.0 weight = 0	batch_size = 500 epochs = 20 learning_rate = 0.001 hidden_size = 100 gamma = 1.0 weight = 0	representation_size = 100		
				batch_size = 500 epochs = 20 learning_rate = 0.001 hidden_size = 100 gamma = 1.0 weight = 0	batch_size = 500 epochs = 20 learning_rate = 0.001 hidden_size = 100 gamma = 1.0 weight = 0	batch_size = 500 epochs = 20 learning_rate = 0.001 hidden_size = 100 gamma = -1.0 weight = 0
Test Acc.	Pred.	0.845		0.850		0.842
	Disc.		0.829		0.828	0.44 (0.32, 0.67)
Represent.		X		Encoder		
		Predictor	Discriminator	Predictor	Discriminator	NMT
Architecture		One-layer NN	Three-layer NN	One-Layer NN		
Hyper param.		batch_size = 16 epochs = 1 learning_rate = 0.001 hidden_size = 64 gamma = 1.0 weight = 0	batch_size = 16 epochs = 1 learning_rate = 0.001 hidden_size = 64 gamma = 1.0 weight = 0	representation_size = 64		
				batch_size = 16 epochs = 1 learning_rate = 0.001 hidden_size = 64 gamma = 1.0 weight = 0	batch_size = 16 epochs = 1 learning_rate = 0.001 hidden_size = 64 gamma = 1.0 weight = 0	batch_size = 16 epochs = 2 learning_rate = 0.01 hidden_size = 64 gamma = -1.0 weight = [0.3,0.7]
Test Acc.	Pred.	0.821		0.845		0.846
	Disc.		0.827		0.852	0.5

For NMT, the prediction is either all 1 or 0.

Represent.		X		Encoder		
		Predictor	Discriminator	Predictor	Discriminator	NMT
Architecture		One-layer NN	Three-layer NN	One-Layer NN		
Hyper param.		batch_size = 500 epochs = 20 learning_rate = 0.001 hidden_size = 100 gamma = 1.0 weight = 0	batch_size = 500 epochs = 20 learning_rate = 0.001 hidden_size = 100 gamma = 1.0 weight = 0	representation_size = 100		
				batch_size = 500 epochs = 20 learning_rate = 0.001 hidden_size = 100 gamma = 1.0 weight = 0	batch_size = 500 epochs = 20 learning_rate = 0.001 hidden_size = 100 gamma = 1.0 weight = 0	batch_size = 500 epochs = 20 learning_rate = 0.001 hidden_size = 100 gamma = -1.0 weight = 0
Test	Pred.					0.849
Acc.	Disc.					0.44
Represent.		X		Encoder		
		Predictor	Discriminator	Predictor	Discriminator	NMT
Architecture						
Hyper param.						
Test	Pred.					
Acc.	Disc.					
Represent.		X		Encoder		
		Predictor	Discriminator	Predictor	Discriminator	NMT
Architecture						
Hyper param.						
Test	Pred.					
Acc.	Disc.					
Represent.		X		Encoder		
		Predictor	Discriminator	Predictor	Discriminator	NMT
Architecture						
Hyper param.						
Test	Pred.					
Acc.	Disc.					

Experiment Note

[illegible]
