CONTENTS

1.	INTR	RODUCTION		
2.	BACI	BACKGROUND AND RELATED WORK		
	2.1	Variatio	onal Autoencoders	3
		2.1.1	Artificial Neural Networks	3
		2.1.2	Autoencoders	9
		2.1.3	Variational Inference	11
		2.1.4	Bringing it Together	12
		2.1.5	Recent Advances	14
	2.2	t-Distributed Stochastic Neighbor Embedding		15
		2.2.1	SNE	15
		2.2.2	t-SNE	16
		2.2.3	Parametric t-SNE	19
3.	METI	METHOD		
	3.1	Learnir	ng a Parametric Embedding Using VAE Sampling	20
	3.2	Robust	ness to Sparse and Noisy Data	23
	3.3	Sampling from Hidden Layers		
	3.4	Inference with the Generative Model		
	3.5	Implementation		26
4.	EXPE	EXPERIMENTS		
	4.1	Data Sets		
	111	4.1.1	MNIST	
		4.1.2	Fashion-MNIST	
		4.1.3	Mass Cytometry	
	• •		tion Metrics	
		4.2.1	Nearest Neighbor Classifier	
		4.2.2	Trustworthiness	
	4.3		k Structure and Parameters	30
	4.4	Learning		31
	4.5	Comparisons		
		4.5.1	Embedding Quality	
		4.5.2	Scalability	
	4.6	Robust	ness to Sparse Data	
	4.7	Robustness to Noisy Data		
	4.8	Sampling from Hidden Layers		
	4.9	Inference with the Generative Model		
5.	CON		NS	40
KE.	FEKEN	CES		42