Data Science Ethics

Concepts, Techniques and Cautionary Tales

DAVID MARTENS



Contents

About the Author			xiii
1.	Introduction to Data Science Ethics		
	1.1	The Rise of Data Science (Ethics)	1
	1.2	Why Care?	2
	1.3	Right and Wrong	4
	1.4	Data Science	7
	1.5	Data Science Ethics Equilibrium	10
		The FAT Flow Framework for Data Science Ethics	13
	1.7	Summary	29
2.	Ethical Data Gathering		
	2.1	Privacy as a Human Right	32
		Regulations	36
	2.3	Privacy Mechanisms	45
	2.4	Cautionary Tales: Backdoors and Messaging Encryption	62
	2.5	Bias	70
	2.6	Cautionary Tales: Bumps, Gorillas, and Resumes	75
	2.7	Human Experimentation	77
	2.8	Cautionary Tales: Dating, Happiness, and Ads	81
	2.9	Summary	82
3.	Ethical Data Preprocessing		85
	3.1	Defining and Measuring Privacy	86
	3.2	Cautionary Tales: Re-identification	92
	3.3	Defining and Selecting Variables	102
	3.4	Cautionary Tale: Pregnancy and Face Recognition	104
	3.5	Fair Relabelling	111
	3.6	Cautionary Tale: Biased Language	115
	3.7	Summary	117
4.	Ethical Modelling		121
	4.1	Privacy-Preserving Data Mining	122
		Discrimination-Aware Modelling	136
	4.3	Cautionary Tale: Predicting Recidivism and Redlining	143
		Comprehensible Models and Explainable AI	148
	4.5	Cautionary Tale: Explaining Webpage Classifications	166

		Including Ethical Preferences: Self-Driving Cars Summary	168 170
5.	. Ethical Evaluation		173
	5.1	Ethical Measurement	173
	5.2	Ethical Interpretation of the Results	178
	5.3	Ethical Reporting	182
	5.4	Cautionary Tale of Diederik Stapel	188
	5.5	Summary	189
6.	. Ethical Deployment		191
	6.1	Access to the System	191
	6.2	Different Treatments for Different Predictions	195
	6.3	Cautionary Tales: Censoring Search and Face Recognition	198
		Honesty and DeepFake	200
	6.5	Governance	202
	6.6	Unintended Consequences	205
	6.7	Summary	211
7.	Con	clusion	213
Bibliography			217
Inc	Index		