Contents

	Contributors p	<i>age</i> vii
	Preface	xi
1	Semantics of Probabilistic Programming: A Gentle Introduction <i>Fredrik Dahlqvist, Alexandra Silva and Dexter Kozen</i>	1
2	Probabilistic Programs as Measures Sam Staton	43
3	Application of Computable Distributions to the Semantics of Prob- abilistic Programs Daniel Huang, Greg Morrisett and Bas Spitters	- 75
4	On Probabilistic <i>λ</i> -Calculi Ugo Dal Lago	121
5	Probabilistic Couplings from Program Logics Gilles Barthe and Justin Hsu	145
6	Expected Runtime Analyis by Program Verification Benjamin Lucien Kaminski, Joost-Pieter Katoen and Christoph Math eja	h- 185
7	Termination Analysis of Probabilistic Programs with Martingales Krishnendu Chatterjee, Hongfei Fu and Petr Novotný	5 221
8	Quantitative Analysis of Programs with Probabilities and Concen- tration of Measure Inequalities <i>Sriram Sankaranarayanan</i>	- 259
9	The Logical Essentials of Bayesian Reasoning Bart Jacobs and Fabio Zanasi	295

vi	Contents	
10	Quantitative Equational Reasoning Giorgio Bacci, Radu Mardare, Prakash Panangaden and Gordon Plotkin	333
11	Probabilistic Abstract Interpretation: Sound Inference and Appli- cation to Privacy	
	José Manuel Calderón Trilla, Michael Hicks, Stephen Magill, Piotr Mardziel and Ian Sweet	361
12	Quantitative Information Flow with Monads in Haskell Jeremy Gibbons, Annabelle McIver, Carroll Morgan and Tom Schrijvers	391
13	Luck: A Probabilistic Language for Testing Lampropoulos Leonidas, Benjamin C. Pierce, Li-yao Xia, Diane Gallois-Wong, Cătălin Hrițcu, John Hughes	449
14	Tabular: Probabilistic Inference from the SpreadsheetAndrew D. Gordon, Claudio Russo, Marcin Szymczak, JohannesBorgström, Nicolas Rolland, Thore Graepel and Daniel Tarlow	489
15	Programming Unreliable Hardware Michael Carbin and Sasa Misailovic	533