

CONTENTS

Introduction	vii
Nomenclature	xx
List of Contributors	xxii
1 A brief introduction to some simple stochastic processes <i>Benjamin Lindner</i>	1
2 Markov chain models of ion channels and calcium release sites <i>Jeffrey R. Groff, Hilary DeRemigio, and Gregory D. Smith</i>	29
3 Stochastic dynamic bifurcations and excitability <i>Nils Berglund and Barbara Gentz</i>	65
4 Neural coherence and stochastic resonance <i>André Longtin</i>	94
5 Noisy oscillators <i>Bard Ermentrout</i>	124
6 The role of variability in populations of spiking neurons <i>Brent Doiron</i>	153
7 Population density methods in large-scale neural network modelling <i>Daniel Tranchina</i>	181
8 A population density model of the driven LGN/PGN <i>Marco A. Huertas and Gregory D. Smith</i>	217
9 Synaptic ‘noise’: Experiments, computational consequences and methods to analyse experimental data <i>Alain Destexhe and Michelle Rudolph-Lilith</i>	242
10 Statistical models of spike trains <i>Liam Paninski, Emery N. Brown, Satish Iyengar, and Robert E. Kass</i>	272
11 Stochastic simulation of neurons, axons, and action potentials <i>A. Aldo Faisal</i>	297

12	Numerical simulations of SDEs and SPDEs from neural systems using SDELab	344
	<i>Hasan Alzubaidi, Hagen Gilsing, and Tony Shardlow</i>	
	Index	367