



# **COMPUTING THE ENVIRONMENT**

**Digital Design Tools for  
Simulation and Visualisation  
of Sustainable Architecture**

**WILEY**

Brady Peters & Terri Peters

# CONTENTS

## FOREWORD VI-IX

*Phil Bernstein, Yale School of Architecture*

## 1. INTRODUCTION—COMPUTING THE ENVIRONMENT: DESIGN WORKFLOWS FOR THE SIMULATION OF SUSTAINABLE ARCHITECTURE 1-13

Brady Peters and Terri Peters

## 2. NEW DIALOGUES ABOUT ENERGY: PERFORMANCE, CARBON AND CLIMATE 14-27

Terri Peters

## 3. PARAMETRIC ENVIRONMENTAL DESIGN: SIMULATION AND GENERATIVE PROCESSES 28-42

Brady Peters

## 4. DESIGNING ATMOSPHERES: SIMULATING EXPERIENCE 43-57

Brady Peters

## 5. USE DATA: COMPUTING LIFE-CYCLE AND REAL-TIME VISUALISATION 58-73

Terri Peters

## 6. NEAR FUTURE DEVELOPMENTS: ADVANCES IN SIMULATION AND REAL-TIME FEEDBACK 74-93

Terri Peters

## 7. DESIGNING ENVIRONMENTS AND SIMULATING EXPERIENCE: FOSTER + PARTNERS SPECIALIST MODELLING GROUP 94-105

Brady Peters

## 8. MAXIMISING IMPACT THROUGH PERFORMANCE SIMULATION: THE WORK OF TRANSSOLAR KLIMAENGINEERING 106-117

Terri Peters

## 9. DESIGNERS NEED FEEDBACK: RESEARCH AND PRACTICE BY KIERANTIMBERLAKE 118-127

Terri Peters

**10. ARCHITECTURE SHAPES PERFORMANCE: GXN  
ADVANCES SOLAR MODELLING AND SENSING  
128-137**  
Terri Peters

**11. BESPOKE TOOLS FOR A BETTER WORLD: THE ART  
OF SUSTAINABLE DESIGN AT BUROHAPPOLD  
ENGINEERING 138-149**  
Brady Peters

**12. BIG IDEAS: INFORMATION DRIVEN DESIGN 150-162**  
Brady Peters

**13. SIMULATING THE INVISIBLE: MAX FORDHAM  
DESIGNS LIGHT, AIR AND SOUND 162-175**  
Terri Peters

**14. WHITE ARCHITECTS: BUILD THE FUTURE 176-183**  
Terri Peters

**15. CORE: INTEGRATED COMPUTATION AND RESEARCH  
184-191**  
Terri Peters

**16. SUPERSPACE: COMPUTING HUMAN-CENTRIC  
ARCHITECTURE 192-200**  
Brady Peters

**17. ZHACODE: SKETCHING WITH PERFORMANCE 201-209**  
Terri Peters

**18. WEWORK: BUILDING DATA FOR DESIGN FEEDBACK  
210-217**  
Terri Peters

**19. GLOBAL ENVIRONMENTAL CHALLENGES:  
TECHNOLOGY DESIGN AND ARCHITECTURAL  
RESPONSES 218-235**  
Brady Peters and Terri Peters, with contributions from  
Timur Dogan, Werner Sobek, William W Braham, Kiel  
Moe, Neil Katz, and Mostapha Sadeghipour Roudsari

**INDEX 236-242**