Foreword

Wireless Sensor Network (WSN) technology is gaining popularity due to its use in the design of several natural systems such as environmental monitoring, natural disaster monitoring, human intrusion detection and more importantly in medical systems using implantable sensors. These systems require sustainable operation without power interruption or power failure. Therefore uninterrupted energy delivery has become an important objective in the design of new wireless sensor networks. This objective may be achieved through new and upcoming technologies in wireless computing such as energy harvesting mechanisms. Energy harvesting provides sustainable energy management features in wireless sensor networks. The first inspiration for energy harvesting comes from solar energy harvesting, which itself has roots in the study of biological objects looking towards the sun for their energy needs and the photosynthesis process by plants. This attracted researches to look for more biologically-inspired energy harvesting solutions ranging from human foot striking vibration energy and tree trunk swaying inspired wind energy.

Therefore, biologically-inspired computing can provide potential solutions for wireless sensor networks to extend sensor lifetime. Besides that, efficient energy harvesting mechanisms and energy transmissions techniques are also essential to address the stated problems in wireless sensor networks. An extensive literature on energy harvesting applications, energy harvesting mechanisms, energy transmission techniques, green information and green databases provided in this book can be a potential guide for researchers in this vast and emerging field. Besides that, bio-sensors and bio-fuel cells are also gaining popularity in the context of renewable energy.

This book assists the academic and industrial communities with up to date information about recent advances in sustainable energy with focus on energy harvesting, renewable energy and green computing. Further, it discusses various biologically-inspired solutions for autonomic computing such as self-healing and self-sustainability through energy-efficient computing. In addition, this book encourages more research in biologically-inspired solutions for sustainable energy management.

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