PREFACE FOR THE SPECIAL ISSUE OF MATHEMATICAL BIOSCIENCES AND ENGINEERING, BIOCOMP 2012

The International Conference *"BIOCOMP2012 - Mathematical Modeling and Computational Topics in Biosciences"*, was held in Vietri sul Mare (Italy), June 4-8, 2012. It was dedicated to the Memory of Professor Luigi M. Ricciardi (1942-2011), who was a visionary and tireless promoter of the 3 previous editions of the BIOCOMP conference series. We thought that the best way to honor his memory was to continue the BIOCOMP program. Over the years, this conference promoted scientific activities related to his wide interests and scientific expertise, which ranged in various areas of applications of mathematics, probability and statistics to biosciences and cybernetics, also with emphasis on computational problems. We are pleased that many of his friends and colleagues, as well as many other scientists, were attracted by the goals of this recent event and offered to contribute to its success.

Like its predecessors, BIOCOMP2012 was conceived as a program of invited lectures, selected contributed papers and round table discussions for specialists in Biomathematics and related fields, aiming to promote interaction between experts on different branches of science, and to encourage the transfer of knowledge and insight among applied mathematicians, theoretical biologists and physicians. Topics included mathematical models, stochastic approaches and computational tools in information processing and neuronal coding, in ecology and population dynamics. The invited talks addressed retrospective and prospective studies on cybernetics, biophysics, artificial intelligence, and bio-computation (K. Nicholas Leibovic, Roberto Moreno-Díaz and Paul Cull), collective behavior (Simon A. Levin and Masayasu Mimura), neuronal models and coding (Henry C. Tuckwell, Frank Hoppensteadt and Petr Lánský), modeling of viral infections and epidemic models (Alan Perelson and Odo Diekmann), and new biological and medical problems (Shun-ichi Amari, Alan Hastings, Vincenzo Capasso, Kazuyuki Aihara, Iwasa Yoh, Joaquín Marro).

This volume contains 13 articles chosen from about sixty papers submitted for the conference proceedings. These were selected with a careful eye to their scientific quality and relevance to the specific topics of the conference, or more general methods and tools for biomathematics. The articles explore a variety of topics, including: collective behavior in a population of interacting stochastic agents; mathematical, physical and computer-based studies of neuronal models and of related information processing and transmission; stochastic and statistical descriptions of single or small network of neurons; processes underlying the synchronization in the pacemaker of circadian system; neural network models and synchronous activity within networks; various topics in population dynamics and ecology, with a special view on computation, decision and optimization issues.

We are grateful to the Institutions and all those who have supported the conference, and in particular the members of the organizing committee, for their dedication and activity. We would like to thank the authors for their valuable contributions, the referees for their priceless efforts of reviewing the manuscripts, and Professor Yang Kuang for encouraging us and making this volume realized.

In the spirit of the conference, we dedicate this issue to Luigi, a great man, an enormously appreciated scientist and a generous mentor.

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Guest Editors:

Aniello Buonocore
Dipartimento di Matematica e Applicazioni "Renato Caccioppoli"
Università di Napoli Federico II, Italy
E-mail address: aniello.buonocore@unina.it

Antonio Di Crescenzo
Dipartimento di Matematica
Università di Salerno, Italy
E-mail address: adicrescenzo@unisa.it

Alan Hastings
Department of Environmental Science and Policy
University of California, USA
E-mail address: amhastings@ucdavis.edu