
Preface

Neuro-Fuzzy Associative Machinery for Comprehensive Brain and Cognition Modeling is a graduate-level monographic textbook. It represents a comprehensive introduction into both conceptual and rigorous brain and cognition modeling. It is devoted to understanding, prediction and control of the fundamental mechanisms of brain functioning. The objective of the monograph is to provide a reader with a scientific tool that will enable him/her to actually *perform* a competitive research in brain and cognition modeling.

This book has four Chapters and Appendix. The first Chapter gives an introduction into brain anatomy, physiology and biophysics, as well as psychology and engineering of cognition. It also introduces the functorial meta-language, which is essential for global comprehension of brain and cognition. The second Chapter reviews various approaches (or, functors) currently used for brain and cognition modeling, including: (i) nonlinear dynamics and chaos, (ii) control and complex systems and networks, (iii) intelligent (BDI) agents, (iv) neural networks, (v) cellular automata and genetic algorithms, (vi) fuzzy logic, and (vii) synergetics. The third Chapter develops the neurodynamics, neuro-synergetics and synchronization approach of brain and cognition modeling. The fourth Chapter further develops fuzzy and neuro-fuzzy systems. It also gives our neuro-fuzzy modeling approach to real-life games. The Appendix has two sections: (i) universal language of categories and functors, and (ii) glossary of frequent neurophysiological terms.

Target readership includes all researchers and students interested in brain and cognition modeling (in computer science, engineering, mathematics, physics, chemistry, biology, psychology, sociology, economics, medicine, etc.), working both in industry (i.e., clinics) and academia.

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*V. Ivancevic, Defence Science & Technology Organisation,
Australia, e-mail: Vladimir.Ivancevic@dsto.defence.gov.au*

*T. Ivancevic, School of Mathematics, The University of Adelaide,
e-mail: Tijana.Ivancevic@adelaide.edu.au*

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Ivancevic, V.G.; Ivancevic, T.

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