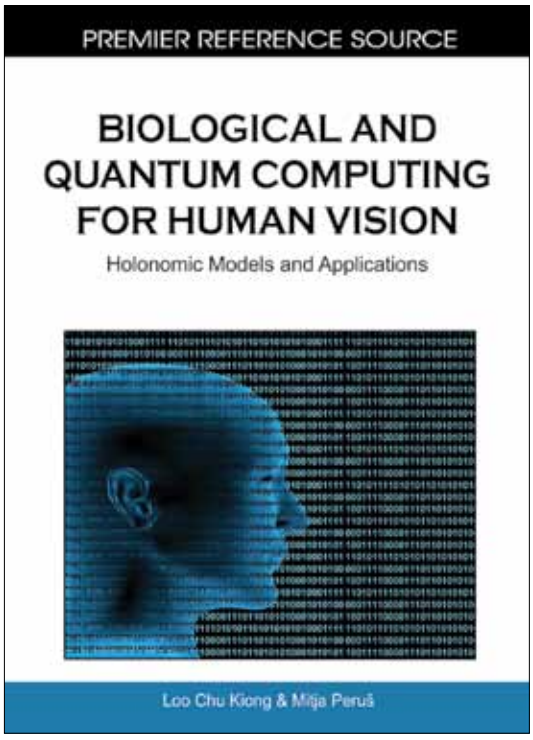
An Excellent Addition to Your Library!

Released: November 2010

Biological and Quantum Computing for Human Vision: Holonomic Models and Applications



ISBN: 9781615207855; © 2011; 314 pp.
Print: US $245.00 | Perpetual: US $365.00 | Print + Perpetual: US $490.00

Mitja Peruš (University of Ljubljana, Slovenia) and
Chu Kiong Loo (Multimedia University, Malaysia)

Many-body interactions have been successfully described through models based on classical or quantum physics. More recently, some of the models have been related to cognitive science by researchers who are interested in describing brain activity through the use of artificial neural networks (ANNs).

Biological and Quantum Computing for Human Vision: Holonomic Models and Applications presents an integrated model of human image processing up to conscious visual experience, based mainly on the Holonomic Brain Theory by Karl Pribram. This work researches possibilities for complementing neural models of early vision with the new preliminary quantum models of consciousness in order to construct a model of human image processing.

Topics Covered:

- Applications of quantum associative network
- Convolution, correlation and matrix-processing
- Holonomic brain processing.
- Holonomic theory of vision
- Maximal presentation of information
- Quantum associative network
- Quantum neural information processing
- Retinopic mapping
- The holonomic model of visual perception
- Visual processing and neuroscience

Market: This premier publication is essential for all academic and research library reference collections. It is a crucial tool for academicians, researchers, and practitioners and is ideal for classroom use.

Mitja Peruš has developed the ideas presented in this book since the time of his PhD studies of physics and cognitive (neuro)science at the University of Ljubljana, Slovenia, and research work at the National Institute of Chemistry and Institute BION, both in Ljubljana, Royal Holloway and Bedford New College of the University of London, Eastern Illinois University at Charleston, and during post-doc (EU's Marie Curie project) at the Institute for Computer Vision and Graphics of the Graz University of Technology, Austria. He has also been a consultant to the director of the IT company Stroka Ltd., among others. He is affiliated with the Laboratory for Cognitive Modelling of the Faculty for Computer and Information Science in Ljubljana, among others, and lectures also at the Sigmund Freud University in Vienna. This book emerged out of Peruš's PhD dissertation "Conscious Image Processing – A Holonomic Model" under supervision of the world-renowned pioneer brain scientist Professor Karl H. Pribram, Stanford and Georgetown Universities, USA. It is acknowledged in the literature that Peruš pioneered (since 1992-5), together with researchers like Professors Subhash Kak, Walter Schempp and Dan Ventura, the field of quantum neural networks and organized the first conferences on the topics. This had a huge echo in the nineties, leading to many publications even before, and independently to, the quantum computing boom. Collaboration with Assoc.-Prof. Dr. Loo Chu Kiong and his team brought further simulational and applicational development of this model. Dr. Peruš published three books and about 60 papers on topics related to this book; he lectured at about 40 scientific conferences, received two awards for these topics, which are also widely cited. He worked and lectured on the model during visits at several scientific institutions all over the world. He established the Slovene Society for Cognitive Sciences. Peruš's research experience includes neural networks, cognitive, information and vision sciences (object recognition, especially), biophysical foundations of brain and cognitive sciences, statistical physics of spin systems and other complex (bio)systems, foundations of quantum theory, quantum information theory.

Section 1:

Section 2: