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Complex-Valued Neural Networks

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Complex-Valued Neural Networks

► **Latest research on Complex-valued Neural Networks**
► **2nd enlarged and revised edition**
► **Written by a leading expert in the field**

This book is the second enlarged and revised edition of the first successful monograph on complex-valued neural networks (CVNNs) published in 2006, which lends itself to graduate and undergraduate courses in electrical engineering, informatics, control engineering, mechanics, robotics, bioengineering, and other relevant fields.

In the second edition the recent trends in CVNNs research are included, resulting in e.g. almost a doubled number of references. The parametron invented in 1954 is also referred to with discussion on analogy and disparity. Also various additional arguments on the advantages of the complex-valued neural networks enhancing the difference to real-valued neural networks are given in various sections.

The book is useful for those beginning their studies, for instance, in adaptive signal processing for highly functional sensing and imaging, control in unknown and changing environment, robotics inspired by human neural systems, and brain-like information processing, as well as interdisciplinary studies to realize comfortable society. It is also helpful to those who carry out research and development regarding new products and services at companies. The author wrote this book hoping in particular that it provides the readers with meaningful hints to make good use of neural networks in fully practical applications. The book emphasizes basic ideas and ways of thinking. Why do we need to consider neural networks that deal with complex numbers? What advantages do the complex-valued neural networks have? What is the origin of the advantages? In what areas do they develop principal applications? This book answers these questions by describing details and examples, which will inspire the readers with new ideas.