

PREFACE

During the last years, chaos theory has been repeatedly applied to a variety of brain electromagnetic signals. Especially in pathological states — like epilepsy — nonlinear time series analysis (NTSA) of the electroencephalogram provides valuable insights and promise important for clinical use. However, despite wide interest from several neuroscience disciplines, many potential users of NTSA are not sufficiently familiar with modern methods. On the other hand, researchers developing new concepts and algorithms for time series analysis often lack the necessary neuroscientific and medical knowledge. Thus, it seemed timely to bring together different physical, mathematical, neuroscientific, and clinical expertise to guarantee successful applications of NTSA methods to brain dynamics, thereby stimulating the exchange of ideas and techniques. We believe that the interdisciplinary workshop on “Chaos in Brain?” held in Bonn from 10 – 12 March 1999, succeeded in doing so. One hundred and thirty-five researchers from ten different countries participated in the workshop; talks and poster contributions collected in the present proceedings give ample evidence for its success.

The workshop was organized by the John von Neumann-Institute for Computing (NIC) at the Forschungszentrum Jülich and the Department of Epileptology of the Bonn University Medical Center. The NIC was founded in July 1998 by the Forschungszentrum Jülich and the Stiftung Deutsches Elektronen-Synchrotron (DESY) to advance supercomputer-oriented scientific research. The NIC is the successor of the Höchstleistungsrechenzentrum (HLRZ) and continues the successful work in the area of supercomputing and its applications. This includes allocation of supercomputing resources for research projects in academia, research institutes, and industry as well as engagement of supercomputer-oriented research in selected areas of physics, chemistry, and other disciplines. The Department of Epileptology of the University of Bonn hosts the only Chair for Epileptology in Germany. In cooperation with the Department of Neurosurgery, it is one of the leading epilepsy centers in the world. One important research project — funded by the Deutsche Forschungsgemeinschaft — focuses on nonlinear EEG analysis to understand brain functions and epileptogenic processes as well as anticipation and prevention of epileptic seizures.

We are very grateful to the financial support from the German Section of the International League against Epilepsy, the German Society for Clinical Neurophysiology, and the Forschungszentrum Jülich which made the workshop possible. But even more important for its frictionless organization was the efficiency and cheerfulness of the conference secretaries H. Frank and A. Deußen, and the help of B. Krahl-Urban from the public relations office of the Forschungszentrum.

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