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BIBLIOGRAPHY OF SELF-ORGANIZING MAP (SOM) PAPERS: 2002–2005 ADDENDUM

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ABSTRACT: Two comprehensive lists of articles on the Self-Organizing Map (SOM) have been published earlier in the Neural Computing Surveys. They contain references to scientific papers that deal with analyses and applications of the SOM, or have essentially benefited from the SOM. The previous lists together contained 5384 papers from the years 1981-2001. The present addendum contains 2333 new articles on the SOM from the years 2002-2005. We have also provided a keyword index to help finding the articles of interest.

KEYWORDS: self-organizing map, bibliography

1 INTRODUCTION

The Self-Organizing Map algorithm [ii, iii, i]was introduced in 1981. The earliest applications were mainly in the area of engineering. Later the algorithm has become progressively more accepted as a standard data analysis method in a wide variety of fields that can utilize unsupervised learning: clustering, visualization, data organization, characterization, and exploration. The variant called Learning Vector Quantization (LVQ) has additionally been used extensively in supervised tasks, especially classication and supervised pattern recognition.

Two comprehensive lists of articles on the Self-Organizing Map (SOM) have been published earlier in the Neural Computing Surveys [iv, v]. They contain references to scientific papers that deal with analyses and applications of the SOM, or have essentially benefited from the SOM. The previous lists together contained 5384 papers from the years 1981-2001. The present addendum contains 2333 new articles on the SOM from the years 2002-2005.

Many of the papers on SOM analyze the method or present variants or generalizations of it. Most of the papers, however, apply the method or its variants in fields ranging from engineering (including image and signal processing and recognition, telecommunications, process monitoring and control, and robotics) and natural sciences to medicine, humanities, economics and mathematics. The definitive reference to the state of the art in SOMs is [i].

1.1 Collection method

We have been collecting a bibliography of scientic papers on SOM already for many years. Our criterion in selecting papers has been that they should either use or analyze the SOM, or benet from it in some other manner. Our intention has been to exclude papers that merely refer to the algorithm.

Several methods have been used in collecting the bibliography. We have added references to papers that have appeared in the journals and conference proceedings that we personally follow. In addition, several authors have kindly helped us by sending us bibliographies on their own papers. Finally, we have made searches in commonly used bibliographic databases.

We intend to maintain the bibliography in the future. New entries are planned to be included as addenda in this journal. Additionally, the entries will be available in BibTEX format at the WWW address
http://www.cis.hut.fi/research/refs/[1]

Additions to the list and error reports are most welcome; please send any correspondence to the email address biblio@mail.cis.hut.fi.

[1]This address may change in the future due to the restructuring of the university. Helsinki University of Technology will become Aalto University School of Science and Technology from the beginning of year 2010. Presumably the new address will be easily found with some suitable Web search tool using the title as the query.

1.2 Advice on using the bibliography

We have constructed a keyword index to aid in exploring the vast bibliography. Unfortunately, it would have been infeasible to compile manually a complete index of the whole collection of papers, and we have therefore constructed a keyword index. The keywords included are mainly based on the earlier bibliographies. The papers were chosen mostly automatically based on the words that appear in their titles or abstracts, and therefore the index cannot be as well-organized as a manually generated one. For example, all of the papers that treat speech recognition cannot be found using the index entry *speech*. On the other hand, some index terms may contain references to several kinds of papers. For example, it may be clear that all of the papers that contain the word *growing* do not analyze growing SOMs.

Despite the problems mentioned above we felt that it was important to make every possible clue of useful information available; it would be a totally infeasible task to browse through the complete list of papers when searching for papers on a specic topic. We hope that this compilation approves to be useful for all those who conduct research on the theory and applications of the Self-Organizing Map.

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