

# Preface

**The Laboratory of Computer and Information Science (CIS, informaatiotekniikan laboratorio)** is one of the research and teaching units of the Department of Computer Science and Engineering at Helsinki University of Technology. The laboratory has its roots in the Electronics Laboratory, established in the 1960's by Professor Teuvo Kohonen. For more than 30 years, the research in the laboratory has concentrated on neurocomputing, especially associative memories, self-organization, and adaptive signal and image processing, as well as on their applications on pattern recognition.

**The Neural Networks Research Centre (NNRC, neuroverkkojen tutkimusyksikkö)** was established by Professor Kohonen in 1994 as a separate research unit with its own funding and own administrative position. It was selected as one of the first national Centers of Excellence in research in 1995. The Academy of Finland extended its Center of Excellence status for the years 2000 to 2005 under the research proposal "New Information Processing Principles". This status also implies financial resources from the Academy, Tekes, and HUT, which are gratefully acknowledged.

The Neural Networks Research Centre operates within the Laboratory of Computer and Information Science, coordinating the major part of its research activities. It is not possible to separate the personnels of these two units, as the teaching staff of the LCIS also participate in some research project of the NNRC. Professor Erkki Oja is presently the director of NNRC, with Professor Olli Simula the vice-director, and Professor Juha Karhunen participating in its research projects. In addition, 18 post-doctoral researchers, 34 graduate students, and a number of undergraduate students are working in the NNRC projects.

Professor Heikki Mannila joined the CIS laboratory in 1999. He is partner and vice-director of the **From Data to Knowledge research unit (FDK, Datasta tietoon - tutkimusyksikkö)**, a joint effort between Helsinki University of Technology and the University of Helsinki. Also this research group was selected as a national Center of Excellence from the beginning of 2002. Although the Neural Networks Research Centre and the From Data to Knowledge research unit are financially separate and stem from different research traditions, there is an overlap in the research directions and projects between these two Centers of Excellence. This overlap has already produced fruitful joint research which is expected to increase in the future.

The present report covers the activities during the years 2002 and 2003. Basically, the report is divided in two parts. In the first part, the research of the NNRC is reviewed. In the second part, those projects of the FDK research unit are reviewed, that pertain to the research activities in the CIS laboratory. The main reason for this separation is that the present booklet also serves as the official report of the NNRC to its sponsors, and it is important to clearly distinguish exactly what work has been done under those finances.

The earlier status of the NNRC, up to the end of 2001, was thoroughly explained in the triennial reports 1994 - 1996 and 1997 - 1999 as well as the biennial report 2000 - 2001. The web pages of the laboratory, <http://www.cis.hut.fi/> also contain up-to-date texts.

To briefly list the main numerical achievements of the period 2002 - 2003, the laboratory produced 8 D.Sc. (Eng.) degrees, 2 Lic.Tech. degrees, and 33 M.Sc. (Eng.) degrees. The number of scientific publications appearing during the period was 229, of which 59 were journal papers. Compared to the previous two-year period 2000 - 2001, the number of doctoral degrees increased by 2, the number of publications by 35, and the number of journal papers by 21. It can be also seen that the impact of our research is clearly increasing, measured by the citation numbers to our previously published papers and books, as well as the number of users of our public domain software packages.

A large number of talks, some of them plenary and invited, were given by our staff in the major conferences in our research field. We had several foreign visitors participating in our research, and our own researchers made visits to universities and research institutes abroad. The research staff were active in international organizations, editorial boards of journals, and conference committees. During the reporting period, Professor Erkki Oja was President of the European Neural Network Society. Also, some prices and honours, both national and international, were granted to members of our staff.

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