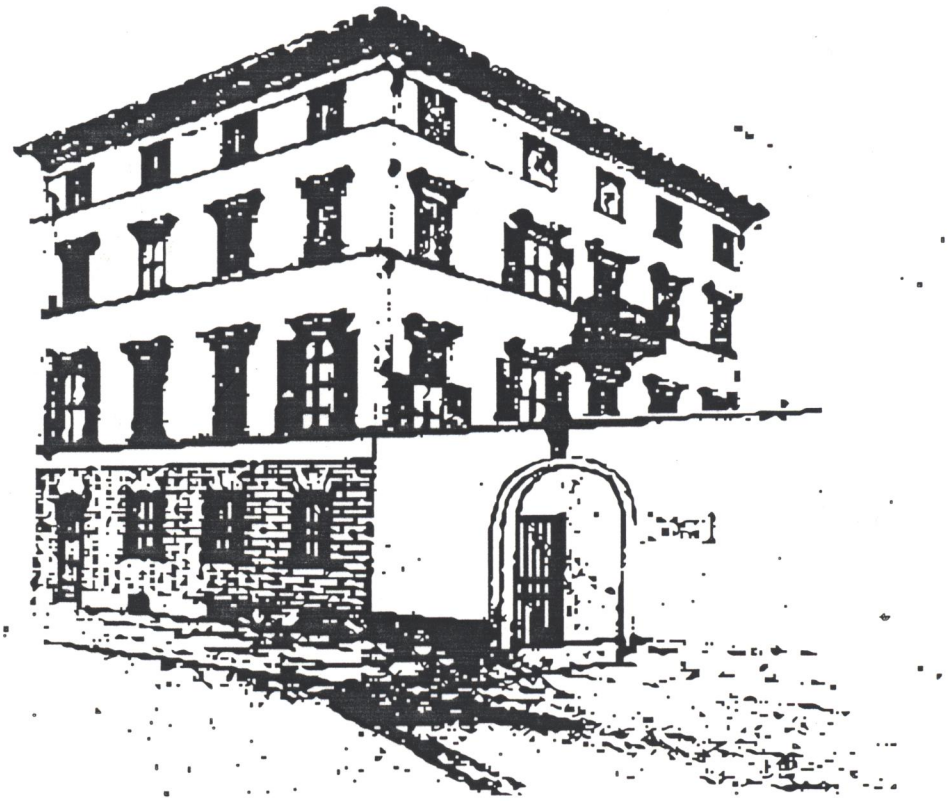
CONSIGLIO NAZIONALE DELLE RICERCHE
National Research Council



I.E.I.

Istituto di Elaborazione della Informazione

Institute for Information Processing

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The origin of IEI

The Origin of IEI

The Polytechnic in Milan and the Istituto per le applicazioni del Calcolo (IAC) of CNR in Rome were the first institutions to equip themselves with electronic computers in the early 50's, and it is not surprising to find nowadays strong research group there.

The example was followed by others, although mainly to fulfil specific applications (typically, nuclear energy).

The origins of the "Istituto di Elaborazione della Informazione" (Institute for Information Processing - IEI) can be traced back to 1954. In this year the University of Pisa took a more courageous step: following a proposal of the great physicist Enrico Fermi, it was decided to use the financial backing which had been offered by a consortium of the University of Pisa and the Districts of Pisa, Lucca and Livorno, to design and realise the first computer in Italy to be dedicated entirely to scientific purposes. With this objective, the "Centro Studi Calcolatrici Elettroniche - C.S.C.E." (Centre for Studies on Electronic Computing) was set up.

This decision was also of great importance in helping to bring Italy into line with the rapid international scientific and technological development in course at that moment.

By 1960, the CEP - the Pisa Electronic Computer - was operational. The studies which had been performed to design and develop the computer also stimulated the development of new skills and the preparation of scientists and technicians in this sector. This growth of expertise was later (1969) to contribute significantly to the establishment of the Institute for Computer Sciences at the University of Pisa, which in 1982 became the Department for Computer Sciences. For the first 5 years of activity the teaching staff of the Institute for Computer Sciences was almost entirely covered by researchers of IEI.

In 1968, the CSCE became an Institute of the Italian National Research Council (CNR), and was made responsible for conducting interdisciplinary theoretical and applied research activities in the information processing sector. This gives to the IEI the peculiar characteristic to be able to conduct activities that range from basic research to the development and realisation of hardware/software prototypes.

Beyond of the above mentioned results, the initiative determined in Pisa a general development of activities in the informatics area, both at theoretical and applied level. The Milestones of this are summarised in Table 1.

That was the antefact and the origin of IEI, the present largest Italian academic research group in computer sciences.

Table 1

Milestones of Informatics in Pisa

1955	• Foundation of CSCE (Centre for Studies in Electronic Computing founded by a Consortium of the University of Pisa and the districts of Pisa, Livorno and Lucca) *Objective: to design and develop the first Italian scientific computer: CEP-Pisa Electronic Computer.*
1961	• Official Inauguration of the CEP
1962	• CSCE becomes part of CNR (Italian National Research Council)
1965	• Foundation of CNUCE (National Computing Centre of the University of Pisa) *Objective: scientific computing (IBM 7090)*
1968	• CSCE becomes the "Istituto di Elaborazione della Informazione" (Institute for Information Processing) of the "Consiglio Nazionale delle Ricerche" (Italian National Research Council) (IEI-CNR) *Objective: research and development in information processing*
1969	• Institution of degree course in Computer Sciences (University of Pisa) Objective: education and training at university level
1973	• Courses in computer sciences are introduced at the Faculty of Engineering as part of the degree course in Electronics (University of Pisa). Objective: education and training at university level
1973	• C.N.U.C.E. becomes CNUCE - Institute of CNR Objective: research and services (IBM 3090, 3081)
1978	• Foundation of the "Istituto di Linguistica Computazionale" (ILC) of CNR (Institute for Computational Linguistics)
1982	• Foundation of the Department for Computer Sciences (University of Pisa)
1987	• Foundation of the Pisa Research Consortium (Aeritalia, Province of Pisa, CNR, Pisa Chamber of Commerce, "Cassa di Risparmio" Bank of Pisa, Pisa City Council, Data Management, Intecs, National Institute for Nuclear Physics (INFN), IRI, Italsiel, Olivetti, Selenia, SOGEI, Systems & Management, "Scuola Normale Superiore", "Scuola Superiore di Studi Universitari e Perfezionamento S. Anna", Tecsiel, University of Pisa).
1989	• Foundation of the "Dipartimento di Ingegneria dell'Informazione", Faculty of Engineering of the University of Pisa.

The organisation of IEI

The Organisation of IEI

The IEI is one of the 27 Institutes reporting to the National Advisory Committee for Physical Sciences.

The scientific and administrative responsibility of the Institute is assigned to the Director, appointed by the President of CNR, following a proposal of the National Advisory Committee for Physical Sciences. The Director is assisted by a Scientific Board, which is composed by 4 experts nominated by the Council of Presidency of CNR, 4 members elected by the personal of the Institute plus the Director, for a total of 9 members.

The CNR staff is of 106 persons, while, considering the visiting professors and part time collaborators, the running staff is about 125 persons.

The Institute is organised in five research and six service departments. The percentage distribution of the personal respect to the departments is illustrated in Table 2.

The different research branches cover areas which are strictly related to information processing and collateral areas interested in the development of applications of the latest data processing technologies.

The main research activities are in applied mathematics, programming languages and software engineering, system architectures, database theory and applications, and image and signal processing. Of particular technical importance are the service activities in the software certification and in the image processing areas.

The present composition of the research and service departments is presented in Tables 3a, b.

IEI possesses several computing systems and equipment for general application and digital signal processing: SUN/3, Silicon Graphics, HP and RISC Workstations, Macintosh and MS-DOS compatible PC. In addition, special systems for image acquisition and processing, particularly oriented towards territorial surveying and medical applications, have been developed at the IEI itself and patented.

Most of the systems are connected via an ETHERNET Local Area Network. The IEI LAN is linked, by a 2Mb/sec line, to CNUCE and to the GARR network. This makes high performance computing resources (including parallel processing) available to all the IEI researchers and insert the Institute in the international networking system.

Table 2

General information

Total surface area 4,500 sq.m.

Personnel The CNR staff of the Institute is 106
The full staff at the Institute is about 125

Percentage distribution of the CNR personnel

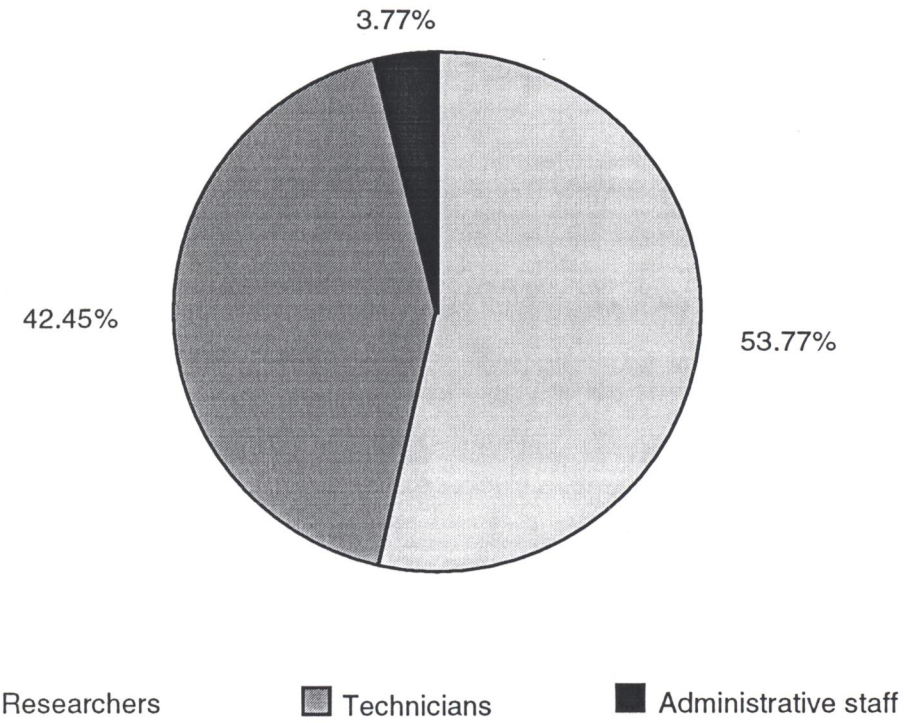

Table 3a

Internal Organisation of the Istituto di Elaborazione della Informazione (Institute for Information Processing)

Director: Prof. Franco Denoth
e-mail denoth@iei.pi.cnr.it

Management support
Secretariat: G. Tedeschi
Documentation: C. Peters.

RESEARCH DEPARTMENTS

1) Operating Systems and Languages

Head: P. Asirelli: e-mail Asirelli@iei.pi.cnr.it
P. Asirelli, A. Bertolino, M. Fusani, S. Gnesi, P. Inverardi, N. Lijtmaer, F. Mazzanti.

2) Image and Signal Processing

Head: M. Bramanti: e-mail Bramanti@iei.pi.cnr.it
L. Azzarelli, L. Bedini, G. Bertini, S. Bottini, E. Bozzi, M. Bramanti, M. Chimenti, L. Dall'Antonia, F. Denoth, F. Fabbrini, R. March, E. Salerno, O. Salvetti, A. Tonazzini, A. Vaccarelli.

3) System Architectures

Head: E. Martinelli: e-mail Martinelli@iei.pi.cnr.it
P. Ciompi, F. Di Giandomenico, F. Grandoni, E. Martinelli, M. C. Pinotti, E. Rigobon, L. Strigini.

4) Advanced Information Processing Techniques

Head: C. Thanos: e-mail Thanos@iei.pi.cnr.it
M. B. Baldacci, A. Baldini, D. Castelli, V. Lami, E. Locuratolo, C. Meghini, M. Mennucci, D. Musto, F. Rabitti, E. Ricciardi, F. Sebastiani, C. Thanos.

5) Computational Mathematics

Head: C. Montani: e-mail Montani@iei.pi.cnr.it
B. Biagi, B. Codenotti, P. Favati, G. Fiorio, C. Montani.

Table 3b

Internal Organisation of the Istituto di Elaborazione della Informazione (Institute for Information Processing)

SERVICE DEPARTMENTS

1) Scientific Support

Head: A. Baldini
M. Mennucci Bernardini, A. Passerotti, G. Rossini

2) Administration

Head: A. Baldini
S. Bensi, R. Diciotti, A. Lenzi, S. Miconi, C. Pastoris, G. Ricci.

3) Technical Support

Head: A. Vaccarelli: e-mail Vaccarelli@iei.pi.cnr.it
G. Gagliardi, C.A. Giorgi, P. Guerrini, A. Landucci, A. Moretto, M. Moretto, C. Ori, P. Pardella, A. Pinelli, A. Ribolini, G. Serchiani, A. Tozzi.

4) Documentation

Head: M. Mennucci: e-mail Mennucci@iei.pi.cnr.it
S. Giannini, M. Jurek, P. Venerosi.

5) Programming and Computing Support

Head: V. Lami: e-mail Lami@iei.pi.cnr.it
S. Biagioni, C. Carlesi, C. Lami, C. Navona, F. Stiavetti, P. Stiavetti, S. Zaccagnini.

6) Image Processing Service

Head: L. Azzarelli: e-mail Azzarelli@iei.pi.cnr.it
M. Ballati, R. Bozzi, S. Cerri, E. Fantini, R. Panicucci, L. Pardi.

An overview of the 1993 activities

The 1993 activities

Primary objectives

Interdisciplinary, theoretical and applied research activities in information processing area are carried on at the IEI. In particular the following sectors are covered:

- applied mathematics
- programming language, and software engineering
- system architectures
- data base theory and applications
- image and signal processing

Both basic and applied research activities are mainly performed within the framework of several national and international research projects and programs.

Research (basic and applied)

The Institute participates in many national and international research activities. Within Italy, it is involved in the "Progetti finalizzati" and "Progetti strategici" of the Italian National Research Council: special projects financed for applied researches in areas considered to be "strategic" at National level. The "Progetti finalizzati" are collaborations between CNR Institutes, Universities, Industries and Public Administrations , whereas the "Progetti strategici" are mainly restricted to collaborations between CNR Institutes.

At international level, IEI actively participates in ESPRIT programs (European Strategic Programme for Research and Development in Information Technology), the computer science programme founded by the Commission of the European Communities to promote applied research projects in the Information Technology field.

Furthermore, the Institute is a partner in a number of bilateral agreements with foreign research institutions operating in the public and private sectors. IEI has also been appointed by CNR as its official representative in ERCIM, the European Research Consortium for Informatics and Mathematics.

The Institute also has numerous contacts with Industries and Governmental Institution which range from collaborations of a strictly scientific nature to the certification of hardware and software products on commission from the Italian Ministero delle Finanze.

International co-operation

The Institute participate to international project mainly through:

ESPRIT projects:

- BRA FIDE
- COMANDOS
- DELTA-4
- LOTOSPHERE P2304\
- MIRO
- MULTOS
- PDCS
- TODOS

Bilateral projects

- Brown University Dept. of Computer Science (USA)
- Harbin Shipbuilding Engineering Institute - Harbin (Cina)
- University of Erlangen Nuernberg Lehrstuhl fuer Informatik (Germany)
- University of Manchester Dept. of Computer Science (UK)
- University of Southern California Signal & Image Processing Institute (USA)
- University of Sussex Computer Science (UK)
- Advanced Software Technology Dept. AT&T Bell Lab. (USA)

International agreements

- Aarhus University -Denmark
- Bell Communication Research - Morristown - New Jersey - USA.
- Brown University - Providence - USA
- CERFACS - France
- Computing Learning Center - Dallas - USA
- ERIA - Spain
- ESLAI - Republica Argentina
- ICL - UK
- IITB Fraunhofer Institut - Germany
- INESC - Portugal
- INRIA-Sophie Antipolis - France
- Institute for Computer Sciences - Crete - Greece
- LAAS - Toulouse - France
- LGI/IMAG - Grenoble - France
- Manchester University - UK
- Sussex University - UK
- Trinity College of Dublin - Eire
- University of Glasgow - UK
- University of Hamburg - Germany
- University of Paris XI - France
- University of St. Andrews - UK

A short description of the above mentioned activities, is reported in the following pages.

Teaching and Training

IEI is responsible for didactic and professional training activities and provides lecturers to the University of Pisa and Siena for courses in Mathematics, Engineering and Computer Sciences. About 15 students are yearly present at the Institute, attending, under the guidance of researchers of the Institute, to their master or PhD degrees.

Editorial

Since 1964 IEI is the Editor of the periodical "C ALCOLO".

"CALCOLO" is published quarterly and the international editorial board consider for publication papers on the following subjects: numerical mathematics, programming systems, automata theory, theory of computation, combinatorial problems, graph theory, artificial intelligence.

Other activities

The Institute is involved in other significant activities:

- data and image processing for external users from both public and private sectors
- hardware and software certification of digital equipment.

The Institute is also a reference for many activities (mainly: electronics laboratory, library, certification laboratory) in the setting up of the CNR Research Area, that is expected to become operative during 1995.

OPERATING SYSTEMS AND LANGUAGES DEPARTMENT

Research staff: 6
Technical staff: 1

Area of Activity:

The main activity of the department is the development of formal models and related methodologies to support system design and analysis: the aim is to develop theories, identify methodologies and construct prototype tools based on the employment of formal methods for improving the software production process. This problem is examined not only with reference to sequential systems but also for concurrent and/or distributed systems.

Different methods and approaches are employed, such as logic programming; operational, denotational and algebraic semantics; modal logics, term rewriting systems and quality testing.

Software tool prototypes are constructed so that the theoretical results can be tested.

Objectives:

- Theories, methodologies, prototype tools for improving the software production process

Research themes:

- Semantic models for concurrent systems, behavioural equivalencies and modal logics
- Logic databases and integrity constraints checking
- Verification techniques and tools for communication protocols
- Various formal aspects concerning deductive databases to build systems for software specification and verification
- Various aspects in equational reasoning
- Methods and tools for the validation and the certification of products and the development process in the software technology
- Programs testing
- Methods and tools for the human computer interface
- Techniques for designing the run time support of different distributed applications

IMAGE AND SIGNAL PROCESSING DEPARTMENT

Research staff: 14
Technical staff: 1

Area of Activity:

The research activity of the department, in connection to basic research projects as well as to scientific co-operation agreements with industry and government agencies, is carried out along these directions:

- study and experimentation of techniques, algorithms and systems for the acquisition and processing of one and two-dimensional signals with reference to several problems which are typical of physics and engineering, and particular to applications in the biomedical sector and in system diagnostics in industrial environments;
- development of physical, mathematic and numeric methodologies for image acquisition, processing and rendering;
- design of digital techniques for data acquisition, processing and storing.

Objectives:

- Proposal of methods for signal processing with reference also to several problems encountered in physics and engineering, particularly in the biomedical and industrial field.

Research themes:

- Image formation and acquisition
- Study and development of visual languages
- Data structures and pictorial data bases
- Study of solution methods for inverse problems
- Neural networks

Technological transfer activities:

- Contracts of scientific collaboration between IEI and Centre for Thermal and Nuclear Research (CRTN) of Italian Energy Agency (ENEL).

Main topics:

- Real time monitoring of unburned content in power plant combustion processes (United States Patent, Patent number 4. 754, 214, Assignes: CNR, ENEL).

- Tomographic reconstruction of thermal maps in power plant combustors by means of acoustic and electromagnetic techniques.
- Advanced instrumentation for density measurements in free-board region of fluidized-bed combustors and in pneumatic transport lines of pulverised coal. (Patent pending, Assignees: CNR, ENEL).

- Contracts of scientific collaboration between IEI-CNR and Alenia, Aeritalia & Selenia, Pomigliano d'Arco, Napoli

Main topics:

- development of automatic procedures for material and defect characterisation using ultrasound inspection techniques
- development of a robot-based workstation for the inspection of three-dimensional shaped specimen
- design and development of an information structure with real-time and parallel acquisition, processing and analysis of multidimensional and multispectral signals
- development of procedures for 3D rendering of US reluctance maps

- Contracts of scientific collaboration between IEI-CNR and Leglertex (Bergamo), Mahlo (Saal a.Donau) and Scriba (Torino) in the frame of the European Brite Project "Automatic on-line systems for detection, evaluation and mapping of defects and variation monitoring of finished fabrics".

Main topics:

- design and development of a HW/SW architecture capable of real-time inspection, analysis and classification of defects
- implementation of a database containing all the defect features in function of various fabrics, different environmental conditions and recording instrumentation

- Contracts of scientific collaboration between IEI-CNR and MBB (Munich), Fokker (Amsterdam), Sabca (Bruxelles), Casa (Madrid) in the frame of the European Brite Project "Non contact methods for NDT of aeronautic structures", a co-operation is carrying on in the field of diagnostic imaging using thermographic inspection of complex material.

Main topics:

- design and development of a HW/SW architecture capable of real-time, parallel and distributed thermal image acquisition and processing
- implementation of a dedicated environment for algorithm testing/debugging and for working in a problem-oriented context
- integration of different kinds of data (images, models, graphs, etc.) and of different methods of inspection (pulsed thermography, stationary thermography, etc.)

- Participation of IEI-CNR to the Finalised Projects "Robotics" and "Information Systems and Parallel Computation" promoted by CNR

- Participation to the Finalised Projects "Robotics" and "Information Systems and Parallel Computation" promoted by CNR

SYSTEM ARCHITECTURE DEPARTMENT

Research staff: 8

Area of Activity:

The basic research is concentrated on the theory of system architectures for general and special applications. The main objectives are both speculative, with the investigation of basic research themes, and applicative, aimed at the definition of project methodologies able to meet the revolution to which processing systems are today subjected as a result of continuous technological developments. In particular these topics are covered:

- design of VLSI algorithms and structures with optimal area-time complexity, and high parallelism degree to enhance processing speed;
- study of methodologies for reliable and dependable software systems design, stressing constraints from critical applications such as real time and hazardous industrial plants.

Objectives:

- Definition of design methodologies to meet the evolution of processing systems as a result of technological developments

Research themes:

- High speed VLSI arithmetic structures
- Study of highly reliable algorithms for diagnosis, reconfiguration, recovery and communication in distributed systems
- Study of hardware and software of fault tolerant systems.
- Definition of parallel algorithms and complexity evaluation of their implementation on parallel shared-memory machines (PRAMs)

Technological transfer activities:

- CNR Special Project "Computing Systems and Parallel Processing": Definition of parallel data structures
- CNR Special Project "Design environments and architectures for distributed computing systems"
- Contract in the frame of ESPRIT Basic Research Action "PDCS": definition of methodologies and design criteria for the improvement of dependability and safety of computing systems.

ADVANCED INFORMATION PROCESSING TECHNIQUES DEPARTMENT

Research Staff: 13

Area of Activity:

The activity of the department is directed towards the study of modelling and linguistic aspects of data and knowledge bases, the study of the operational and architectural aspects of advanced database/knowledge base systems and the study of the computational properties of knowledge representation languages. In particular the following arguments are covered as research themes:

- data base and object oriented programming languages integration;
- representation and management of multimedia information;
- knowledge representation and non monotonic reasoning.

Objectives:

- Design of high performance object stores
- Logic-based modelling of multimedia information retrieval

Research themes:

- Definition of models, languages, and architectures for advanced database systems
- Definition of new algorithms for operational aspects of advanced database systems (concurrency control, access control, optimisation of query execution)
- Definition of languages and systems for knowledge representation and manipulation; studies of the computational properties of terminological knowledge representation languages and models of non-monotonic reasoning
- Formal Specification methods for Database Applications Design

Technological transfer activities:

- Contract in the frame of ESPRIT Basic Research Action "Formally Integrated Data Environment - FIDE": to develop the foundations for an integrated data environment
- Contract in the frame of ESPRIT Basic Research Action "Formalisation and Experimentation on the Retrieval of Multimedia Information - FERMI": to develop and evaluate a formal theory of multimedia information retrieval (MIR)

- Sub-contract in the frame of ESPRIT "Advanced System and Software Engineering Enabling Technologies - ASSET": to implement a multivendor distributed open systems environment

The Department is a node of the **Network of Excellence** "Information and Data on Open Media for Network of Users - IDOMENEUS" funded by CEC ESPRIT Basic Research Actions.

COMPUTATIONAL MATHEMATICS DEPARTMENT

Research Staff: 7

Area of Activity

The activity of the department mainly concerns the analysis and synthesis of algorithms with particular reference to numerical and graphic algorithms and to the relative data structures.

With the recent diffusion of parallel and vectorial computing, the analysis and synthesis has been essentially directed at parallel computing models and VLSI algorithms, integer programming and heuristic solutions of NP complete problems, computer graphics in parallel environments.

Objectives

- Solutions to the problem of designing low-complexity sequential and parallel algorithms for numerical, combinatorial and graphic problems.

Research themes:

- Parallel algorithms in numerical linear algebra
- Sequential and parallel algorithms for combinatorial problems
- Numerical integration
- Algorithms and data structures for scientific visualisation
- Mathematical models for the environmental and territorial studies

SCIENTIFIC SERVICES

Technical and Administrative Staff: 5

Scientific services mainly supports research departments in scientific and technical activities that can be summarised in:

- Preparation of financial budgets of the research activities, organisation of databases, and preparation of tables and work programmes using office automation tools (WP, Data Base, Spreadsheet).
- Organisation of conferences, workshops, courses and seminars
- Editing and translation of scientific articles and technical reports in English
- Editing and publishing of the scientific international journal "CALCOLO"
- Secretarial support for research activities

ADMINISTRATION

Technical and Administrative Staff: 6

The administrative service provides

- Administrative support to the scientific activity
- Computerised management of the Institute's accounts
- Computerised management of ordinary and special finances (ordinary and special budgets, services for external users, CEC and other contracts)
- Computerised management of staff travel, working hours and holidays.

The Administration is also responsible for the maintenance agreements for the scientific equipment.

TECHNICAL SERVICES

Technical Staff: 12

- Technical support for the scientific activities
- Ordinary and special maintenance services
- Hardware certification of fiscal meters

The technical support for the scientific activities, includes the following tasks:

- design and development of electronic equipment
- study of technical tools
- design and construction of mechanical parts
- supply of material
- technical documentation provided by computational support

The service also provides for:

- technical office
- building maintenance
- work safety
- light maintenance

Finally, the service is responsible for the hardware certification of digital equipment for fiscal metering and supplies technical support (repairs and calibration) for equipment used by other CNR and university institutes.

Some of the services are provided not only to the IEI, but to the whole CNR Research Area of Pisa.

DOCUMENTATION SERVICES

Technical Staff: 3

The library currently contains more than 7000 books and subscribes to 387 scientific reviews and 19 abstracting journals, which makes it one of the most complete in Europe in computer sciences. Reports, pre-prints, microfilm and microfiche are also available. The books are classified according to the classification scheme of the Cambridge Communication Corporation and the catalogue is organised according to the cataloguing rules of the Library of U.S. Congress. Every two years, the library publishes a catalogue of all its periodicals which is distributed to Italian organisations working in different areas of computer science. The library is open to visitors for consultation from 9.00-12.30, Monday to Friday. The library can be consulted using an information retrieval system, designed and developed at the Institute.

User can search the documentation they need in:

- the author and title catalogue
- the subject catalogue
- DIALOG, an on-line catalogue, designed and developed at IEI, which contains bibliographic data for the publications acquired by the library since 1979
- an automatic catalogue of the journals and internal reports of the Institute.

The users of the library are mainly CNR research and technical staff and university students and professors, in particular from CNUCE and the Department for Computer Science of the University of Pisa.

The library constitutes the main nucleus of the Research Area Library and is one of the most complete in Europe in Computer Science

PROGRAMMING AND COMPUTING SUPPORT

Technical Staff: 7

The service is responsible for:

- Technical support to the scientific activity
- Assistance in the installation and running of distributed computing systems
- Certification of software for fiscal meters
- Management of an intelligent node of the OSIRIDE network with the UNYSIS 2200 system.

As a support to the scientific activities of the Institute, service duties are:

- library automation
- acquisition and processing of biomedical signals
- automatic management of hospital case-histories
- software engineering

The service is also responsible for:

- collaborations with university institutes and clinics and with local authorities
- development and maintenance of procedures for the automation of the Institute's administrative services.

IMAGE PROCESSING SERVICE

Technical Staff: 6

The Image Processing Service is a highly specialised service, responsible for four different activities:

- technical assistance and maintenance of the computing systems of the Institute;
- data and image processing activities for external users from both the public and private sectors
- design and development of specialised software for numerical image processing;
- design and development of structures and devices for image acquisition, processing and restitution.

The Service operates computing systems and workstations for image manipulation and restitution, and is responsible for specialised tools and workstations for the acquisition and digital processing of images oriented towards different application sectors.

Much of this equipment, which has made IEI one of the leading European figures in this sector, has been designed and developed by the Service in close co-operation with the Image and Signal Processing Division, within the frameworks of "Progetti finalizzati e strategici" of CNR and in scientific and technical collaborations with various public and private institutions.

WORKING GROUP FOR CERTIFICATION AND CHECKING OF DIGITAL APPARATUS

Research staff: 1
Technical assistants: 4

The activity was begun in response to a request from the President of the Ministerial Commission of the Italian Ministero delle Finanze for the approval of digital equipment for fiscal metering.

The working group makes use of expertise acquired in various sectors of information processing and related disciplines, in particular in software engineering and system reliability.

The main areas of activity are strictly integrated:

Hardware	- reliability evaluation; safety;
	- MTBF of context dependent systems;
	- quality checking;
Software	- study of reliability evaluation criteria;
	- life cycle analyses;
	- criteria for project methodological analysis;
	- quality checking.

The work is divided into the following activities:

1) Participation in national and international organisations which propose and establish certification standards

2) Development of certification methodologies

3) Application of the standards and methodologies to the certification service