

## HUSAT - 21 YEARS OF HCI

### THE HUMAN SCIENCES & ADVANCED TECHNOLOGY RESEARCH INSTITUTE

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#### THE INSTITUTE

The Human Sciences and Advanced Technology (HUSAT) Research Institute is the largest centre for the study of human factors and advanced technology in Europe. Established on 1 August 1970, it has grown rapidly in recent years and now has 46 member and 5 associated scientists, supported by 16 secretarial and administrative staff. The 51 researchers have a wide range of skills, experience and training in ergonomics, psychology, computer and information sciences, and engineering. The Institute is led by five Directors (Prof. Brian Shackel, Leela Damodaran, David Davies, Brian Pearce & Prof. Ken Eason). The full-time research staff are employed by the University on fixed term personal contracts not tied to the external contracts.

The multi-disciplinary nature of the group ensures that a broad approach can be taken to research problems and facilitates an integrated 'systems design' view of applications projects and consultancy work. The Institute undertakes research on the human issues associated with emerging forms of advanced technology, for example on the human user aspects of continuous speech recognition and of electronic publishing, but is also particularly concerned with the translation of research into practice. In its balance between research and application HUSAT seeks to influence technological systems as they are developed; it aims to work directly on systems development or to convert research results into forms suitable for use by system designers.

#### AIMS

The 'Mission and Aims' of HUSAT are:

1. To undertake research studies and consultancy on the human aspects and implications of advanced technology.
2. To use the concepts and methodology of the various human sciences, where appropriate, in the design, implementation and use of advanced technology.

3. To disseminate our knowledge of human factors and ergonomics, and also the information and experience gained from continued involvement in the above activities.

Last year 1990 HUSAT reviewed the position of human factors in the design of IT systems and concluded (as have others) that it is still a situation of 'too little too late'. We consider this problem of technology transfer to be a crucial issue for this decade; therefore, we have set a general HUSAT 'Mission' for the 90s to be the Institutionalising of Human Factors into the Design Process.

#### WORK AREAS

Following from the three aims stated above, the work of the Institute can be divided into three broad categories: research, consultancy and information dissemination. In these three categories the Institute aims for about 40% of effort to be on research, 40% on consultancy or application projects and 20% on dissemination. This balance is intended to ensure that research concentrates on real issues, that application projects can benefit from the most recent research findings, and that dissemination builds upon results of both research and application projects (ie. basically as in the original aims of 1970).

HUSAT's areas of research and application cover the complete range of ergonomic and human factors issues involved in the design, installation and use of computer systems and advanced technology. Typical examples include the design and evaluation of hardware/software interfaces; workstation design and evaluation; environmental factors including vision and lighting; usability assessment; job design and work organisation; facilitating and evaluating the process of introducing new technology; and assisting the integration of the human factors contribution into IT design processes.

#### SOME THEMES

Some of the main themes of HUSAT'S past and present work are now briefly outlined below. Because of our particular concern with the translation of research into practice, these themes are discussed under headings relevant to the areas of technological application.

### Mobile Information Systems

The work includes accident analysis, the effects of introducing in-vehicle technology into the driving environment, and the design of the in-vehicle interface across a range of applications, from carphones to screen-based technology such as route navigation and guidance systems. Particular emphasis is placed on rapid prototyping techniques for interface development and evaluation. A multi-disciplinary approach is taken to the analysis of physiological, subjective, behavioural, and vehicle control data. HUSAT is also playing a leading rôle in the advance of European ergonomic standards (Parkes & Ross 1991) for the safe implementation of in-vehicle systems.

### Organisational Requirements Definition for Information Technology Systems - ORDIT

There is a wide body of research evidence, supported by much of the applied work undertaken within HUSAT, which indicates that many IT systems fail not because they do not meet the users' functional requirements, but because they do not meet their organisational requirements. Future generations of information systems will be integrated, multi-media, multi-user systems rather than stand-alone products. These will have to be carefully matched to the organisational requirements if they are to be successful. The primary aim of the ORDIT project is to find a method of eliciting and formalising organisational requirements, to enable those involved in the design process to take account of these requirements in the design of an IT system. The project is also committed to developing software-based tools to be used as part of a user-centred, iterative design methodology (Eason & Harker 1991).

### Electronic Documentation

For over a decade HUSAT has studied the human issues involved in the design and use of electronic documentation. The BLEND project established the feasibility of an online electronic journal (Shackel 1991), while in Project QUARTET the hypertext electronic journal was developed as a desktop resource for individual scholars. Recent work has investigated hypertext not only as an information interface but also as an environment for collaborative authoring. The design of electronic documentation involves much more than the moving of words from paper to screen, and hypermedia techniques offer a potential which needs to be seen in the wider context of the human use of information resources (McKnight et al 1991).

### OTHER THEME AREAS

Some of our other theme areas which cannot be summarised here through lack of space include:

#### Integrated Speech Technology

#### Advanced Manufacturing Technology

#### H F Aspects of the Computer Integrated Enterprise

### Usability Factors in Video-Communication Systems

#### The Usability Evaluation Service

#### The HILITES Information Service

### SOME PUBLICATIONS

Over the years several books have been oriented specifically towards designers. Examples are the *Applied Ergonomics Handbook* (Shackel 1974); two texts on system and workplace design by Damodaran (et al 1980) & by Stewart (Cakir et al 1980); the possibility of health hazards, addressed in the early days by Pearce (1984); a general text on organisational issues in IT (Eason 1988); and an overview on human factors for IT (Shackel and Richardson, 1991). In 1990 HUSAT produced 1 book, 20 journal papers, 55 reports and 65 contributions to books and conference proceedings.

Cakir A, Hart D J & Stewart T F M (1980) *Visual Display Terminals*. Chichester, Wiley. ISBN 0-471-27793-2.

Damodaran L, Simpson A and Wilson P (1980) *Designing Systems for People*. Manchester, NCC Publications. ISBN 0-85012-242-2.

Eason K D (1988) *Information Technology and Organisational Change*. London, Taylor & Francis.

Eason K D & Harker S D P (1991) Human Factors Contributions to the Design Process. In Shackel and Richardson (eds) (1991), pp. 73-96.

McKnight C, Dillon A & Richardson J (1991) *Hypertext in Context*. Cambridge: Cambridge University Press.

Parkes A M & Ross T (1991) The Need For Performance Based Standards in Future Vehicle Man Machine Interfaces. *Advanced Telematics in Road Transport*. Vol II pp 1312-1321. Amsterdam, Elsevier.

Pearce B (1984) *Health Hazards of VDTs?* Chichester, Wiley. ISBN 0-471-90065-6.

Shackel B (1974) *Applied Ergonomics Handbook*. Guildford, Butterworth. ISBN 0-902-85238-8.

Shackel B (1991) *BLEND-9: Overview and Appraisal*. British Library Research Paper 82; ISBN 0-7123-3231-6.

Shackel B & Richardson S R (eds) (1991) *Human Factors for Informatics Usability*. Cambridge: Cambridge University Press. ISBN 0-521-36570-8.

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