

The biggest challenges are the social ones: workshop report from EICS4Med 2011

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ABSTRACT

EICS4Med was held in conjunction with EICS2011 in Pisa. Many challenges to designing innovative healthcare applications were identified, including the tendency to design conservatively to avoid patient harm and the difficulties of establishing rich communications between clinicians and engineers. In considering the timescales for developments, the group concluded that technical developments are more easily achieved than the equally essential cultural changes, such that which errors are accepted and regarded as learning opportunities, and investment is directed toward the design of safer, more usable systems.

INTRODUCTION

First the statistics: the workshop was attended by 23 participants from 6 countries, and 14 papers were presented. These covered a variety of medical systems:

- Visualisation, simulation and VR systems (e.g. for training or surgery);
- Systems to support cooperation, coordination and planning;
- Clinical information systems; and
- Medical devices.

Presentations were kept brief so as to maximise the time for discussion.

CRITERIA FOR SUCCESS

In discussing criteria for success, it became apparent that our research is motivated by many different aims, including:

- Avoiding harm to patients;
- Improving the reliability of systems;
- Delivering better training for clinicians; and
- Improving patient treatment through innovation.

Workshop report from EICS4Med 2011 workshop.

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The aims of delivering innovative technologies that may improve patient outcomes and of avoiding harm can sometimes be in conflict with each other, as avoiding harm may imply a conservative approach to development, focusing on reliable engineering rather than innovation. Other challenges that were identified included:

- How to balance the need for consistency (as nurses and patients move from one context to another) with the need for specialisation (to optimise for local needs);
- When systems should be context-aware, adapting to the context of use, and when design should be tailored to specific needs;
- To what extent clinicians (and other users) should be expected to be trained in the use of particular systems, and to what extent systems should be “walk up and use” tools that require minimal training;
- How to improve communications between clinicians and engineers, who bring complementary skills sets to design, but may also bring incompatible understandings and conflicting values; and
- How to identify and meet the real needs of medicine, and avoid “tilting at windmills”, addressing imagined but low priority issues.

Although participants came with different interests and priorities, there was nevertheless a consensus that the ultimate aim of research on the engineering of interactive computer systems for medicine should be on developing systems that work for the people (clinicians, patients and others) who use them, and who are dependent on them for effective treatment.

PRIORITISING FUTURE RESEARCH

The afternoon activity built on the theme of challenges by considering what the priorities for future research and development should be. This was done with the aid of post-it notes and a time-line, considering not just what the priorities are, but also the timescale on which they might be achieved (see Figure 1).

The latter proved to be the subject of much discussion, as the question of what it means to “have achieved” something in this area is often unclear: unlike challenges such as mapping the human genome or putting a person on the moon, most of the challenges we identified cannot be easily classified as “done” or “not done”, as typically something has already been achieved, but it is always possible to do better.



Figure 1: constructing and voting on a timeline

Priorities were voted on by the group with the use of coloured dots, and proposals were grouped into larger themes to produce a summary timeline (Figure 2). A common thread of these themes was that technology developments were typically judged to be achievable on a shorter timescale than social and cultural changes. This may be because the technologies that we can envisage are ones that – by definition – we have already made some progress on, and for which we can envision what further developments are needed, whereas we recognise the magnitude of the challenge in effecting social change.



Figure 2: the summarised timeline and issues

So, for example, the development of inspectable safety assessments for devices, and the introduction of a “near miss” button for incident reporting were considered to be achievable within a few years, whereas the creation of a culture in which errors are accepted and regarded as learning opportunities, and where the healthcare system invests heavily in the design of safer, more usable systems, were regarded as much longer term objectives.

These challenges help define a future research agenda in engineering interactive computer systems for medicine.

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