Medical Informatics

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http://www.it.uu.se/research/hci

Course homepage:
http://www.it.uu.se/edu/course/homepage/medinf/ht11
Have you ever...

- ...visited a health care unit?
- Who did you meet there?
- Did you see any computers? Technology?
The use of computers and information technology contributes to better and more efficient health care?
Many different kinds of applications
Important for safety, efficiency

From life saving systems......

...to administration
Image processing
Decision support, expert systems

• Can technology support very skilled professionals?
• Can technology make people skilled?
Home care – mobile work
Mobile acute care
The design is important
E.g.: A “clinical overview”
Are there problems??

• Yes, many!!

• E.g.:
  – Low usability – users often not satisfied
  – Systems not adjusted to the context
  – Many systems not integrated
  – Expensive/slow development – high costs
  – Introduction & training problems
  – Safety risks
  – Security risks, integrity problems

• Why do these problems exist?
What makes IT in health care so special (and difficult)?
Example 1

- The NHS National Programme for IT (NPfIT) is an initiative by the Department of Health in England to move the National Health Service (NHS) in England towards a single, centrally-mandated electronic care record for patients and to connect 30,000 General practitioners to 300 hospitals, providing secure and audited access to these records by authorised health professionals.
- NPfIT is said by the NHS CFH agency to be "the world's biggest civil information technology programme".
- Originally expected to cost £2.3 billion (bn) over three years, in June 2006 the total cost was estimated by the National Audit Office to be £12.4bn over 10 years. Today??
- http://www.connectingforhealth.nhs.uk/
- Leading British computer scientists have called for an independent audit of the NHS’s information technology programme to verify that the network of systems being installed in England is technically feasible and secure.
Example 2

- “Patient record notes were by mistake taken from another patient’s record – the patient got the wrong drug”
- In the information system, electronic patient record, the medical data is not presented clear enough. The focus is often on administrative data. Safety for patients depend on the correct availability of medical notes.
Example 3 – Dialysis
On 28 Nov 1983 three patients died during dialysis in a Swedish hospital.

They died when diluted dialysis fluid damaged the red blood cells, causing acute cell damage in vital tissues. The dialysis concentrate was not available, and water was pumped into the system.

“The court found that a nurse has caused the accident when she by mistake turned off the alarm system. She was convicted to have caused the death of the three patients and seriously injured several others.”

What is your opinion?
IT in health care

- Should contribute to……?  
- Must fulfil…?  
- How to accomplish this?
The course goal

The course will give you a base for applying information technology in medicine and health care. We will explain some important concepts and problem areas. Especially we will focus on what is needed for development of efficient and usable IT-systems in health care.

You know IT – now you will learn (some aspects) how to apply it to the health care domain.
You will learn about:

- Medical documentation, patient records and communication
- Medical terminology
- Systems development in health care
- Medical image processing
- Telemedicine and decision support systems
- Design of user interfaces in health care
- Standards, laws and regulations
Site visits

Heart surgery

Radiology
Digital X-ray
Assignments

- A small project, assignment, to be performed in groups of e.g. 5 persons.
- To analyse an existing system, evaluate its usability and suggest preliminary solutions to usability problems.
  - or.....
- To investigate, by literature studies etc., some interesting facts related to the use of IT in medicine or health care.
- Start early, i.e. now!!!
Schedule

Overview, Assignment specification
Documentation, patient records
Usability in health care and mobile systems
Standards, laws, rules, regulations
Medical image analysis and systems
University Hospital: Heart surgery
University Hospital: Radiology department
IT and usability in radiotherapy
Telemedicine and decision support
IT development and usability in industry
Supervision
Examination
Group reports
Home page

http://www.it.uu.se/edu/course/homepage/medinf/ht11

Contents
- News
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- Literature
- Examination
- Assignments

Literature
- If available, we recommend: van Bemmel, Handbook of Medical informatics, Springer-Verlag
  This is a good and comprehensive book. See the home page for more.

Examination
- The examination is performed through the assignment (written, oral presentation) and a short
  written examination.
  The assignment is 60% and the written exam 40% of the basis for course credits.

Lecture notes
- Will continuously be added here.

Assignments
- Assignment instructions