# Assignment-3

Q.1 What are the Implementation tools used in HCI applications?

→ The implementation tools used in HCI applications are as follows :-

1. Screen Mock up and Prototyping tools -
   (i) Paper and Pencil
   (ii) Word processor
   (iii) Slide presentation software for presenting content
   (iv) Specialized prototyping tools (Authology, courseware, hypercard).

2. Programming Toolkits -
   Handle standard widgets : MS window developer toolkit, Apple MacApp, Unix X+K.

3. User Interface Management System (UIMS) -
   (i) Set of programming & design techniques which are supposed to add another level of services for interactive system design beyond the toolkit level are 'User Interface Management System' or 'UIMS'.
   (ii) It is a high level specification i.e. source code of UI.

Q.2 Which are the various technologies and designing techniques used for the Web Applications along with HCI?

→ Implementation technology -

1. It is a multidisciplinary research area focused on interaction modalities between human & computer, generally Human Machine Interface (HMI) is used.
2. HCI investigate & tackles all issues related to design & implementation of interface between humans & computers.
3. An intuitive nature, efficient, robust & customizable interface can greatly reduce the gap between human's mental model & way a computer, machine or robot can accomplish a given task.
4. The common implementation process involves image capturing, preprocessing, region & feature extraction, feature matching, pattern recognition, display message.

Change designing for the web -

1. Architecture of Windowing System :-

(i) First option is to implement management of multiple process within each of separate applicatio

(ii) Second option is to implement management role within kernel of operating system, it centralize the management role by freeing it from the individual application.

(iii) Third option provides most probability, as the management function is written as separate application in its own right.

2. Client server architecture -

(i) In this server is used to provide services to single client or multiple clients

(ii) Single machine may also act as server as well as client using tightly coupled architecture.

(iii) Moreover, client & server may be present on different machines with loosely coupled architecture

(iv) This architecture is also used in distributed computing for remotely placed server & client for solving common problem using shared interfaces

3. The X Windows System architecture :-

(i) It is based on fixed imaging model & assumes that there is some pointing mechanism, the X differ from windows system is that it added as a standard, that X is based on network protocol which clearly defines client server communication

(ii) The X server performs the following tasks :

(a) Allows access to display from multiple client applications.

(b) Interprets requests from clients to perform screen operation or provide other information.

(c) Demultiplexes the system of physical input events from user & passes them to appropriate clients.

(d) It is used to minimize the traffic along the network by relieving the clients from having to keep track of certain display information

Q3) How to design & implement HCI project for portable devices such as Smart Phones?

→ 1. Portable devices are those intended to be moved regularly, but not necessarily for handheld use. Portable device design has requirements of rugged packaging, being relatively compact & lightweight & sometimes required battery operation.

2. Handheld device design must ensure that device can be comfortably held by person & has number of added constraints:
   (i) Very lightweight
   (ii) Intuitive to use
   (iii) Easily read display
   (iv) Button press
   (v) Touch screen use must not be fatigue.
   (vi) Usually battery operated.
   (vii) Can't get too warm to hold.

3. Portable devices design & handheld device design incorporates associate electronic design into packaged products. Enclosures for these devices must be lightweight & often water tight sealed, but they should be able to withstand physical abuse while being ergonomic & easy to u

4. To maximize success with minimal cost, short schedules & low risks, a system engineering approaches analyzes usecases & applications specification within proven design processes

5. Portable design technology expertise -
   (i) Low power design

(ii) Small footprint design.
(iii) Displays/ touchscreens
(iv) Rugged design
(v) Operating system
(vi) Security
(vii) Remote device management.

Q.4) Write short note on -

→ 1. Handling Errors & designing help.

(i) When we focus on operator errors & errors caused by HCI, in some system the main goal when as the user interface is to prevent the operator from making mistake & causing harard. Hand Gesture Recognition System (HGRS) using HCI produces error message for incorrect pattern.

(ii) Objective of errors -

(a) Identification variety of errors people make & their possible causes.

(b) Discuss guideline to prevent errors from happening by reducing the causes.

(c) Discuss ways to recover from errors when they do happen.

(iii) Errors are -

(a) Error identification -

1. When error can occur during perceptual error cognitive error.
2. Perceptual errors due to misleading perceptual sensory overload such as battery indications.
3. Cognitive errors occur during complex decision process & high load on memory.

4. Failures we know that what to do but difficult to do it successfully, such as holding a thread in eye as a riddle.
5. Mistakes happen when we do the wrong thing for the good, applying rule in wrong situation, etc.

(b) Preventing errors -
1. Avoid causes such as,
(a) Perceptual - Avoid misleading visual clues.
(b) Cognitive - Avoid memory load.
(c) Motor - Avoid unnatural motor movement.

(c) Error recovery -
1. Provide undo
2. Provide cancel
3. For form input errors, help users locate fields that need to be fixed.
4. Provide context sensitive help
5. Comfort the users.

2. Prototyping and UI software -
(i) Prototyping means visualization of Imagination & thought process of User. Prototype conveys complete information about actual model development. The inputs, outputs & operations of HCI are designed & developed using prototyping. Prototype may be in the form system architecture of HCI system.
ii) System architecture deals with sequential phases

along with input & output.

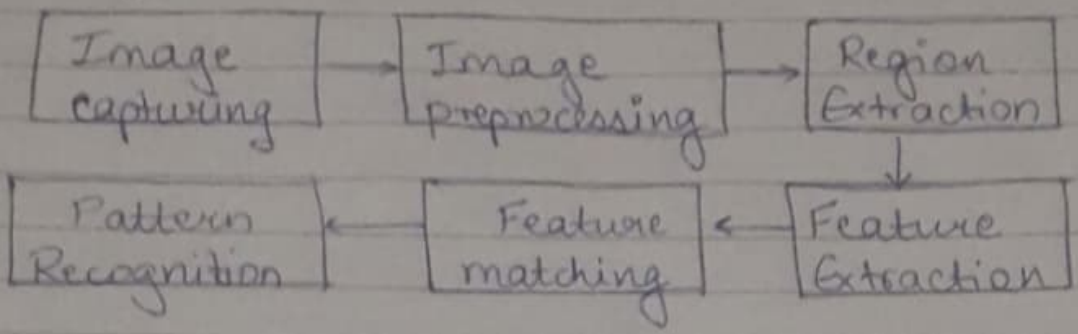


fig: Prototype of HGRS using HCI.

(iii) User Interface (UI) is the front end application view to which user interacts in order to use software. User can manipulate & control software & hardware by means of UI.

(iv) UI is part of software & is designed such a way that it is executed to provide user insight of software.

(v).

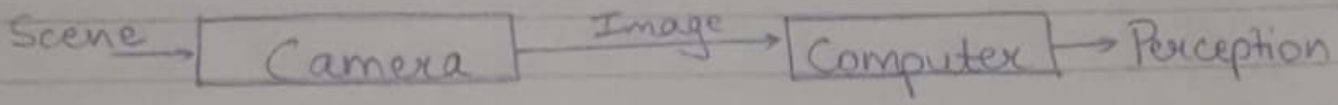


fig: Computer vision for HCI.

(v) UI can be graphical, text based, audio video based depending on underlying hardware & software combination. Software can become popular if its UI is —

(a) Attractive
(b) Simple to use
(c) Responsive in short time

(d) Clear to understand
(e) Consistent on all interfacing screens.
(vi) UI is broadly divided into -
(a) Command line arguments (CLI)
(b) Graphical user interface (GUI)