

Assignment HCI-5

Title: Evaluating Interface.

Problem Statement:

Evaluate an interface using usability evaluation techniques.

Learning Objectives and Outcomes:

- ❖ Understand need of evaluation of interface
- ❖ To choose and understand importance of ethics of evaluation.
- ❖ To carry out evaluation and record responses.
- ❖ Carry out actual work

Requirements:

Notebook and Pen, Product system response recorder.

Theory

Ethical Issues of Evaluation

- ❖ People's privacy should be protected, which means that their name shouldn't be associated with data collected about them or disclosed in written reports.
- ❖ General rule to remember when doing evaluation is to do onto others only what you wouldn't mind being done to you.

Guidelines of Evaluation

- ❖ Tell participants, goals of study and exactly what they should expect if they participate Form of final report should be described and if possible copy offered to them.
- ❖ Pay users wherever possible because this creates a formal relationship.
- ❖ Make sure users knows that they are free to stop evaluation at any time they feel uncomfortable with the procedure
- ❖ Ask user's permission to quate them, promise them anonymity and offer to show them copy of report.
- ❖ Be sure to explain that demographic, financial health or other sensitive information that users disclose or its discovered from the tests is confidential

Evaluation Techniques

A) Observational Methods

1) Think aloud

- ❖ User observed performing tasks.
- ❖ User is asked to describe what he's doing and why.
- ❖ What he thinks is happening

2) Co-operative evaluation

- ❖ Variation of think-aloud.
- ❖ User also participates in evaluation.
- ❖ Both user and evaluator can ask each other questions.

3) Protocol Analysis

- ❖ Paper pencil
- ❖ Audio
- ❖ Video
- ❖ User notebooks

4) Post-task Walkthrough

- ❖ User reacts on action after event.
- ❖ Used to fill intention.

B) Query Techniques

- ❖ Interviews
- ❖ Questionnaire

Interviews are open ended and questionnaires are predefined set of questions. Questionnaires are specific goal-centered whereas interviews must be maintained goal-specific.

C) Physiological Methods

1) Eye Tracking

2) Physiological measurements. –

- ❖ Heart activity
- ❖ Sweat glands

- ❖ Activity in in muscle and brain
- ❖ Hard to interpret

D) Evaluating through User Participation

1) Laboratory

- ❖ Controlled and specialized environment
- ❖ No noise / distraction.
- ❖ If system location is dangerous then this is the appropriate technique.

2) Field Studies

- ❖ Natural environment.
- ❖ Noise / distraction is present
- ❖ Content of evaluation is retained here.

E) Cognitive Walkthrough

- ❖ Performed by expert in cognitive psychology.
- ❖ Experts walk through design to identify potential problems using psychological principles.

Working •

- ❖ I segregated out the red color from the camera and then in each frame made a list of contours and calculated the weighted center for all of the Red contours.
- ❖ At the last I used the mouse dependency to move the cursor to the calculated center (keeping in mind the aspect ratio of camera frame and screen resolution).

- ❖ As of now the cursor fluctuates and hopefully with more knowledge I can make this stable in future.

Evaluate an interface using usability evaluation technique: .

- ❖ User Control? - 80% .
- ❖ Human Limitations? - 40%
- ❖ Model Integrity? - 90% .
- ❖ Accommodation? - 70% .
- ❖ Technical Clarity? - 80% .
- ❖ User Support? - 10% .
- ❖ Consistency, Flexibility, Accuracy, Fulfillment, Precision? - 75%
- ❖ Predictability? - 90% .
- ❖ Responsiveness? - 70% .
- ❖ Interpretation? - 80%

Process and Environment .

- ❖ Input image and resize: map camera to screen coordinates. .
- ❖ Segmentation: we converted RGB color space to YCbCr color space, and then to binary image. .
- ❖ Denoise: Remove unwanted pixels surrounding the main object. .
- ❖ Center and size point recognition of the object by using a convex hull algorithm. .

- ❖ Evaluate the weighted speed control and can move the mouse after detection of focal point of object.

Unique Features •

- ❖ Non-contact human computer modality. •
- ❖ Reduction in hardware cost. •
- ❖ This framework can be useful for controlling different types of applications and games dependent on the controls through user defined gestures. •
- ❖ Can take on 3-D images and vastly be useful in medical industries.

Task Analysis Questions

1. Who is going to use the system? Blind, visually impaired people, people who find usage of hardware mouse as a source of inconvenience for them, companies during presentations.
2. What tasks are desired? To control the mouse using a real time camera and reduce work space.
3. Where are the tasks performed? Medical industry while using it for image without touching anything, people who give presentations, used by a blind or visually impaired person.
4. What' s the relationship between user & data? Data is nothing but user credentials and questions data. Credentials are generated by the user at a time of use and questions are a defined set of data decided by system developers.
5. How often are tasks performed? Task is nothing but interaction between camera and object and it can be performed as many times as the user wants. As per contextual enquiry

conducted by us, users said that they would like to use the mouse stimulator instead of touchpad or physical mouse often as alternate options.

6. What are the time constraints on the tasks? Depends on the interaction between computer and human. Especially the focal point.

7. What happens when things go wrong? For wrong credentials, the mouse cursor does not move, and the program coordinates are set null and also the color detection algorithm can cause a problem if another similar object is observed in the working domain of the webcam.

Conclusion

Evaluation of mouse stimulator is carried out using concepts of AI.