Øving 1 - Kognitive Arkitekturer - MHP/Fitts lov

Frist innlevering: Fredag 15/9

Merk at alle oppgavene under skal løses vha Model Human Processor(MHP).

a) En bremsepedal skal trykkes ned så snart det røde bremselyset til bilen foran lyser opp. Beregn vha. MHP hva responstida blir til pedalen trykkes ned (tegn gjerne opp).

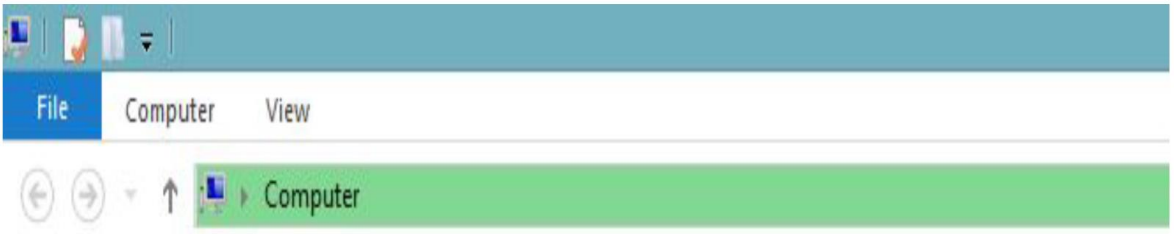
b) Anta at en bruker ser et flagg på en skjerm. Hvor lang tid tar det før hun vet om det er skandinavisk? (Anta at flaggets semantiske navn må hentes fra LTM etc.)

National Flag

c) Hva menes med ID (Index of Difficulty)?
Vi skal bruke Fitts lov til å vise at det er mye hurtigere å flytte kursor til et mål som ligger langs kanten av skjermen enn til et mål som kan posisjoneres fritt bort fra kanten.

Ser vi på menyrekken (menu bar) på Macintosh så ligger den alltid helt i kanten på toppen av skjermen:

På Windows ligger tilsvarende menyer (fullskjermmodus) litt unna kanten, adskilt med en "blå" toppstripe:



Den kan i tillegg flyte fritt med vinduet.

Anta at størrelsen W for Windowsmenyen er 5 mm (figuren over er feil skalert). Målinger på en 15" flatskjerm viser at "kanteffekten" gir en effekt som om W = 50 mm på Macintosh (selv om målet fysisk sett er ca 5 mm også her). Dette skyldes at en slipper å stoppe innenfor menyen - en kan bare flytte kursor mot kanten med passende bevegelse.

Anta at a=50 og b=150 i Fitts lov (Shannon utgaven) og at gjennomsnittlig avstand fra kursor til menyrekken er A=80 mm (på en 15" skjerm). Hvor lang tid tar det å nå menyrekken (menyfelt) på hhv. Macintosh og Windows?

d) Hvor mange bilder pr. sekund må du vise for å lage en illusjon av kontinuitet i tid?

Frivillige Oppgaver

1. Power law of practice

A control panel has ten keys located under ten lights. The user is to press a subset of the keys in direct response to whatever subset of lights is illuminated. If the user's response time was 1.48 sec for the 1000th trial and 1.15 sec for the 2000th trial, what is the expected response time for the 50,000th trial?

2. Key strokes: How fast can a user repetitively push with one finger a key on the typewriter keyboard? How fast can he push two keys using alternate hands?

3.1 Simple Reaction time

A user sits before a computer display terminal. Whenever any symbol appears, he is to press the space bar. What is the time between signal and response? Show your reasoning.

3.2 Physical matches

The same user is presented with two symbols, one at a time. If the second symbol is identical to the first, he is to push the key labeled YES, otherwise he is to push NO. What is the time between signal and response for the YES case? Show your reasoning

3.3 Name matches

Now the user is supposed to press YES if the symbols have the same name (as do letters A and a), regardless of appearance and NO if they did not. What is the time between signal and response for the YES response? Show your reasoning.

3.4 Class matches

Now the user is supposed to press YES if both symbols were letters, as opposed to numbers. What would be the time between signal and response? Show your reasoning.

4. Hick's law

A telephone call director has 10 buttons. When the light behind one of the buttons comes on, the secretary is to push the button and answer the phone. What is the percentage difference in reaction time required between the cases?

(1) Each one of the telephones receives an equal number of calls
(2) Two of the telephones are used heavily, receiving 50% and 40% of the calls, with the remaining 10 % uniformly distributed among the remaining phones

5. Forgetting just-acquired information

A programmer is told verbally the one-syllable file names of a dozen files to load into his programming system. Assuming the names are all arbitrary, in which order should the programmer

write down the names so that he remembers the greatest number of them (has to ask for the fewest number to be repeated)?

Suppose the files don't have arbitrary names but rather names such as **INIT1, INIT2, INIT3, INIT4, PERF1, PERF2, PERF3, PERF4, SYSTEMS1, SYSTEMS2, SYSTEMS3, SYSTEMS4.** In which order should the programmer write down the file names so that he remembers the largest number of them?