Übung Mensch-Maschine-Interaktion

Submission is by email to **mmi1@hcilab.org**

Please use a PDF attachment named **exercise2-groupN.zip** (N is the letter of your group). Each group must hand in one solution. Text must be written in English.

Deadline for submission: **Friday, November 17th 2006, 9 a.m.**

Description:

Model **each of the three tasks** using the KLM as presented in the lecture/exercise. Give a list of operators with comments indicating what step you are currently modelling. Give the sum of the modelled time. Use a spreadsheet program like Excel to speed up the calculation and avoid errors.

Make an appointment to get the specific phone model. Let 3 persons of the group do each task at least 2 times. Measure **all times and write all of them** (not only averages) down in a table. If a task has several steps (e.g. take picture + send MMS) write down separate measurements and a total result. Make **comparisons** with the timings from the model and give reasons and **explanations** for possible differences. Comments on the model and its parameters are welcome.

You will be using either a ~~Siemens S65~~, a Nokia 6630 or a Nokia 6600 mobile phone. You can choose one of them. However, we have only a few of each that you can use for your experiments.

~~**S65 Manual:** `http://www.beng-siemens.com/cds/frontdoor/0,2241,hq_en_0_44657_0,00.html`; there is a menu tree on the last pages.~~

6630 Info: `http://europe.nokia.com/link?cid=PLAIN_TEXT_6284`

6600 Info: `http://www.nokia.com/link?cid=PLAIN_TEXT_6275`

A summary and explanation as well as placement guidelines of the KLM operators will be given at the end of this exercise sheet.

Task 1   Picture/MMS

Take a picture of a person and send it via MMS. (Indicate which part of your model covers taking a picture and which writing/sending the message.)

Task 2   Contact

Save a new contact: Paul Huber, 0175 555 1234, into the address book. Associate the picture from task 1 with the contact.

Task 3   Unlock/Voice Command

From locked mode (need to unlock keypad lock, ~~enter pin~~) record a new voice command for initiating a call to your new contact Paul Huber (Voice Dialing).

Operator		Time
A, Action	marker	1.23
	NFC	0.00
	in general	variable
F, Finger Movement		0.23
G, Gestures		0.80
H, Homing		0.95
I, Initial Act	externally	5.32
	internally	3.89
	optimal setting	1.18
	no assumptions	4.61
K, Keystroke	keypad average	0.39
	keypad quick	0.33
	hotkey	0.16
M, Mental Act		1.35
P, Pointing		1.00
R, Response Time	NFC	2.58
	Visual Marker	2.22
	general	variable
S_{Macro}, Macro Attention Shift		0.36
S_{Micro}, Micro Attention Shift	keypad-display	0.14
	hotkey-display	0.12
	keypad-hotkey	0.04
	in general	0.14
X, Distraction	slight	6 %
	strong	21 %

A, Action : Any special action that is executed with the phone. Examples include taking a picture (marker), using NFC, etc.

F, Finger Movement : Movement of a finger from one position (button) to another. Normally already incorporated into the K, Keystroke operator.

H, Homing : Movement of the phone from a position close to one's ear (listening/talking) to a position where one can read the screen.

I, Initial Act : Time needed from the moment an interaction is planned (incoming call, wish to call someone, etc.) to the real start of interaction (button press etc.).

P, Pointing : Physical movement of the phone to a specific place, e.g., to initiate some Action A there.

R, System Response Time : The time needed by the system to react to user input.

S_{Macro}, Macro Attention Shift : Time needed when the attention (gaze/look) changes from phone to an object in the real world or back.

S_{Micro}, Micro Attention Shift : Attention shifts between display, hotkey region and keypad region. Especially necessary, e.g., when the user has to explicitly verify text input.

X, Distraction : Add 6 or 21% of the time to all operators that happen when the user is slightly or strongly distracted from the task.

M, Mental Act : "The M operator is intended to represent this routine thinking, not complex, lengthy, problem-solving, racking the brain, or creative meditations. In a variety of routine computer usage tasks such as word processing and spreadsheet usage, these routine pauses are fairly uniform in length, justifying the simplifying assumption that all Ms take the same amount of time, around one second." The Mental Act operator is supposed to capture people's need to reflect on executed actions, interpret system responses and plan further actions. "It is based on the fact that when reasonably experienced users are engaged in routine operation of a computer, there are pauses in the stream of actions that are about a second long and that are associated with routine acts such as remembering a filename or finding something on the screen." (from Kieras, D., Using the Keystroke-Level Model to Estimate Execution Times. The University of Michigan, Unpublished Report, Online Version http://www.pitt.edu/ cmlewis/KSM.pdf. 1993).

The following guidelines should help in placing this operator. Use Rule 0 to place candidate M's and then cycle through Rules 1 to 5 for each M to see whether it should be deleted.

Rule 0 Place M's in front of all K's, H's, S$_{Macro}$'s and G's.

Rule 1 If an operator following an M is anticipated in the operator before M, delete the M (e.g., PMK becomes PK).

Rule 2 If a string of MKs belongs to a cognitive unit (e.g., writing a known number), then delete all M's but the first.

Rule 3 If a K is a redundant terminator (e.g., the selection key for entering submenus), then delete the M in front of it.

Rule 4 Delete the M in front of a H which describes the movement from the reading to the listening position.

Rule 5 If unsure, emphasise more the number than the placement of the occurrences of the M operator.