

# Exercise 4 – Mensch-Maschine-Interaktion 1

## Diary Study and Keystroke-Level Model

### 1. Diary Study

(Per-person homework, 1 weeks)

The idea of the study is to collect data about **three different topics** – wellness, advertisement and emotional interaction – by using the **diary method**. Each of you will be assigned one of these topics based on your statements in the online screening questionnaire. You will be given paper diaries at the end of the lecture on Monday, Nov 12<sup>th</sup>. Use these diaries to take notes of situations in your daily life during five consecutive days. Collect events, thoughts, feelings, ideas etc. related to your topic. Nokia will temporarily provide 29 mobile phones, which some of you may use for taking pictures during the diary period. Please save those pictures on the memory card (not on the mobile phone). The 3 most active diary fillers will be rewarded.

#### How to fill Diary Study reporting table

##### Situation:

You were walking towards the bus stop. You noticed that the right bus just arrived and tried to catch in. You failed.



##### Examples:

##### Wellness Diary:

Date, time and place	Wellness related activity or event	Additional information	Photo number or name
15.12, 16.38, Bus stop nr 2368	Running after a bus to the next bus stop.	Heart rate after that was 160bpm.	

##### Emotional Interaction Diary:

Date, time and place	What happened	Person	Feelings	Photo
15.12, 16.38, Bus stop nr 2368	Missed my bus	Boyfriend	Disappointed. Damn, I'll be late for the date! Must call him to tell.	15122007012.jpg

##### Advertisement Diary:

Date, time and Place	Advertisement or Information, Media	Feelings	Photo
15.12, 16.38, Bus stop nr 2368	Hamburger meal poster ad	Hungry and angry, I should stop at hamburger place.	
15.12, 16.39, Bus stop nr 2368	Where's the closest hamburger place?	I wish there was an easy way to find this out, HUNGRY!	

##### Process:

- **Introduction** to diary-method, handing out paper diaries and mobile phones on Nov 12<sup>th</sup> at the end of the lecture.
- Fill out your diary in English during five consecutive days. **Deadline: Nov 19<sup>th</sup>**  
Please put your name on the diary, so that the most active diary fillers can be rewarded.

- **Interviews** and going-through diaries with visitors from Nokia during the exercise sessions (Nov 20<sup>th</sup> / 22<sup>nd</sup> / 23<sup>rd</sup>). Don't forget to bring your diary to the exercise session! For those of you, who got mobile phones, please return them in the exercise session as well.
- Write a one page long **report** of your main findings of the exercise. Your report should also contain a summary of the interview and your lessons learned. **Deadline: Nov 26<sup>th</sup>**

If you can not attend the lecture, you can download the paper diaries here:

- Wellness: <http://www.medien.ifi.lmu.de/lehre/ws0708/mmi1/WellbeingDiary.pdf>
- Advertisement: <http://www.medien.ifi.lmu.de/lehre/ws0708/mmi1/AdvertisementDiary.pdf>
- Emotional Interaction: <http://www.medien.ifi.lmu.de/lehre/ws0708/mmi1/EmotionDiary.pdf>

**Assignment of topics to people:**

Anastasia	wellness	Müller	wellness
Andreas	advertisement	Nogaller	wellness
Annika	wellness	Palleis	advertisement
Asam	emotion	Plötner	emotion
Bafadikanya	wellness	Rademacher	wellness
Ballendat	wellness	Raltchev	advertisement
Belzner	advertisement	Reichert	wellness
Blaha	wellness	Richter	advertisement
Blöckner	emotion	Romanyuk	advertisement
Cherkashyna	wellness	Rümelin	wellness
Dubinska	advertisement	Sauernheimer	wellness
Filonik	emotion	Schmidt	advertisement
Forrai	wellness	Schwanengel	wellness
Gaißert	emotion	Schyschka	emotion
Gottschling	advertisement	Shinetuya	wellness
Gruhn	wellness	Strubel	wellness
Gueney	wellness	Stutzki	advertisement
Gvozdeva	emotion	Tran	advertisement
Hausmann	wellness	Tsukanava	advertisement
Hertzschuch	advertisement	Viezzler	wellness
Hoyer	wellness	Vlad	wellness
Junker	emotion	v. Zezschwitz	advertisement
Kaminski	advertisement	Wallner	wellness
Karl	emotion	Wang	wellness
Kiemer	wellness	Waxenberger	advertisement
Kneißl	wellness	Weikert	wellness
Lang	advertisement	Wenz	emotion
Langer	emotion	Willi	advertisement
Mansfeld	wellness	Witt	emotion
Matuschek	advertisement	Zankl	wellness
Messner	advertisement	Zimmermann	advertisement
Moldenhauer	wellness		

## 2. Keystroke-Level Model

(Per-group homework, 2 weeks)

In this exercise you will learn and use the Keystroke-Level-Model: an interface evaluation technique, based on GOMS (Goals, Objects, Methods, Selection rules).

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

For this exercise you will be using one of the following mobile phones:

- Siemens S65 (manual: <http://forum.modopo.com/downloads.php?do=file&id=346>)
- Nokia E61 (manual: [http://nds1.nokia.com/phones/files/guides/Nokia\\_E61-1\\_UG\\_de.pdf](http://nds1.nokia.com/phones/files/guides/Nokia_E61-1_UG_de.pdf))
- Nokia 6600 (manual: [http://nds1.nokia.com/phones/files/guides/Nokia\\_6600\\_UG\\_en.pdf](http://nds1.nokia.com/phones/files/guides/Nokia_6600_UG_en.pdf))
- Nokia 3220 (manual: [http://nds1.nokia.com/phones/files/guides/Nokia\\_3220\\_UG\\_en.pdf](http://nds1.nokia.com/phones/files/guides/Nokia_3220_UG_en.pdf))

However, we have only a few of each that you can use for your experiments. Contact Gregor Broll ([gregor.broll@ifi.lmu.de](mailto:gregor.broll@ifi.lmu.de)) and make an appointment to get one of them for a certain time slot or just drop by his office. Alternatively, you can also use the mobile phones, which were provided by Nokia for the Diary Study.

Let 3 people of your group do each task at least twice. 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. Compare your results with the times predicted by the model and explain possible differences. Comments on the model and its parameters are welcome.

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

### **Tasks:**

#### **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: John Doe, 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) record a new voice command for initiating a call to your new contact John Doe (Voice Dialing).

**Operators:**

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

**Finger Movement (F):** Movement from one position (button) to another. Normally already included in K (Keystroke operator).

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

**Initial Act (I):** 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.).

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

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

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

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

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

**Mental Act (M):** The Mental Act operator is supposed to capture peoples' need to reflect on executed actions, interpret system responses and plan further actions.

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 %

### **Guidelines:**

The following guidelines should help in placing operators. 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,  $S_{\text{Macro}}$ 's and G's.

**Rule 1:** If an operator following an M is anticipated in the operator before the 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 an H which describes the movement from the reading to the listening position.

**Rule 5:** If unsure, emphasize the number rather than the placement of the occurrences of the M operator.

### **Submission:**

- Submit your solution to the UniWorx1 system. Use an attachment named exercise4-groupN.zip (N is the number of your group).
- Each group must hand in one solution
- Text must be written in English.
- **Deadline:** 26.11.2007, 12 a.m.

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1 <http://www.pst.ifi.lmu.de/uniworx/>