DEPARTMENT OF COMPUTER SCIENCE
UNIVERSITY OF TORONTO

CSC 318W
THE DESIGN OF INTERACTIVE COMPUTATIONAL MEDIA
Winter Term, 2002-3

Assignment 1
a. BRAINSTORMING IDEAS FOR TERM PROJECT
b. BRIEF DESCRIPTION AND PROPOSAL FOR TERM PROJECT

HANDED OUT: Tuesday, January 7, 4 p.m.

a. DUE BACK IN: **Monday, January 13, 4 p.m. to CSC318W Listserv**
WORTH IN MARKING SCHEME: 1 point (INDIVIDUAL GRADE)
(Note: This will not be marked. You get a 1 if you turn it in on time, 0 otherwise.)

b. DUE BACK IN: **Monday, January 20, 4 p.m. to CSC318F Listserv**
WORTH IN MARKING SCHEME: 3 points (TEAM GRADE)

This term all students will work in multidisciplinary 4-5 people teams on a semester-long course project to carry out the user-centred, iterative design of prototypes of interactive computational media based on *wearable computers*. The job of each project team is to conceive, design, prototype, and evaluate a novel design of a wearable device or a novel approach to technology or software based on wearables that assists some group of people in some aspect of their lives, for example, in carrying out activities or tasks in which they are typically engaged.

THE PURPOSE AND TASK OF ASSIGNMENT 1a

The purpose of this assignment is to help you conceive ideas for your term project and help you form the teams of 4-5 people that will be required for carrying it out.

Conceive of **two (2)** applications of wearable computers that fit the problem statement given above, that leverage the capabilities of digital media technologies, and that could contribute significantly to the quality of life of some specific kinds of people.

HEURISTICS FOR COMING UP WITH DESIGN IDEAS

To help you come up with ideas, and to improve existing ones, you might use any or all of the following approaches to stimulate idea development (see also Lecture Notes 1, Hour 2).

1) Think about Maslow's hierarchy of needs (to be discussed in Lecture 1, Hour 2):
• Biological/physiological needs: Oxygen, food, water, body temperaturem, good health
• Security needs: Need to feel safe, free from danger or perceived danger
• Social needs: Love, affection, sense of belonging
• Ego needs: Need to feel satisfied, self confident, valuable, esteemed
• Self-actualization: Need for a cause, a calling, a sense of vocation, fulfillment

2) Think about jobs people do, for example:
• doctor
• policemen
• fireman

• pilot
• plumber
• teacher
• parent
etc.

3) Think about tasks people do, for example,
• writing
• walking
• talking
• reading
• planning
• searching
• remembering
• taking care of themselves
• inspecting things
• fixing things
• caring for people
etc.

4) Think about activities people do, for example:
• work
• learning
• recreation, including sports
• keeping fit
• reflection
• travel
• shopping
• social interaction
• grooming
• sleep
etc.

5) Think about the spaces people inhabit, for example,
• offices
• homes
• kitchens
• workrooms
• vehicles
• the outdoors
• mountains
• water
etc.

6) Think about vehicles, furniture, and appliances people use, for example,
• automobiles,
• buses
• airplanes
• beds
• chairs

• tables
• refrigerators
• ovens
• bath tubs
• sinks
• radios
• television
etc.

7) Think about devices, tools, and instruments people use, for example,
• glasses
• watches
• wallets and purses
• keychains and keyrings
• pens and pencils
• light switches
• power tools
• telephones
etc.

8) Think about parts of the body, for example,
• the head
• the neck
• the chest
• the waist
• the arm
• the wrist
• the leg
• the foot
• the eyes
• the ears
• the mouth
etc.

9) Think about items of clothing and accessories, for example,
• hats
• vests
• jackets
• pants
• suspenders
• belts
• shoes
• jewelry
etc.

10) Think about modalities for sensing the world, for example,
• seeing
• hearing
• feeling

• smelling
• sensing orientation
etc.

11) Think about modalities for affecting (i.e., causing effects on) the world, for example,
• moving oneself
• speaking
• singing
• touching
• grasping objects
• moving objects
etc.

12) Think about the degree to which an individual functions in isolation or not, for example,
• the individual by herself
• pairs of individuals interacting
• small groups of individuals interacting
• organizations
• communities

13) Think about computers or subsystems thereof, for example,
• processors
• memories
• input devices derived from technologies for sensing the world
• output devices derived from technologies for affecting the world

These ideas are not prescriptions for what you should do, nor are they "magic bullets" guaranteed to result in A+ projects. They are meant to get you thinking. They are also only one collection of ideas. You can come up with different and better ideas. There is room for many approaches and there is much freedom to devise a concept and a plan for your project. Please not that technology appeared last in my list of 13 things to think about. Please also do not confuse the very *general* concept of wearable computers with the very *specific* approach popular in the media that is typified by the excellent work of Prof. Steve Mann of Computer and Electrical Engineering.

WHAT EACH INDIVIDUAL SHOULD HAND IN FOR ASSIGNMENT 1a

Describe in one brief paragraph each idea. Include your name, email address, and phone number so that others may contact you to link up with you in a team.

Also describe any relevant special skills and background. For example:
1) Knowledge of some subject domain or work area other than computer science, such as history, zoology, or automobile repair, could be helpful in defining and working on the project.
2) Experience in behavioural or design disciplines could be helpful in developing and executing your project concept.

Post your ideas to the course listserv by Monday afternoon January 13th. The posting should have a descriptive title, e.g., "Navigating Public Transit" or "Nurses Connected via the Net", and not "Assignment 1a" or "John Smith".

Scan the listserv between Monday night Jan. 13 and Tuesday afternoon Jan. 14 so you can begin the process of team formation. This will happen in Assignment 1b.

THE PURPOSE AND TASK OF ASSIGNMENT1b

The purpose of this assignment is to help you crystallize an idea for your term project and to force you to form the teams of 4-5 people that will be required for carrying it out.

Your task is to articulate in 3-6 paragraphs the basic idea for your term project. Describe the need that you would like to meet, the problem that you would like to solve. Describe the kinds of users and/or tasks and/or situations for which your idea is intended. Sketch your idea for a solution, and indicate what you believe is novel or valuable about the idea.

GROUP FORMATION HEURISTICS

The following are useful suggestions as you try to form your groups:

1) Team up with people with whom you have successfully worked in the past.

2) Team up with people whom you know to be bright, hard-working, and resourceful.

3) Team up with people whose skills complement your own. For example, each team would ideally contain at least one of:
- a person knowledgeable in the problem domain, i.e., the needs of senior citizens
- a person who is skilled in programming
- a person skilled in articulating ideas and expressing them in English
- a person skilled in visual thinking, sketching, or graphic design, which can be applied to user interface envisionment and prototyping
- a person skilled in the behavioural sciences, e.g., psychology or sociology, which can be applied to interviewing prospective users and carrying out usability tests.

4) Consider compatibility of goals. There could be problems if some people are trying to get As, and others have less ambitious goals.

5) Consider compatibility of working styles. There could be problems if some people like working ahead and others prefer to wait until the last minute (which of course is very bad for this course), or if some prefer working during the day and others during the night.

No matter how well you form your group, working together will be a challenging process.

Experience has shown that some groups will encounter some of the following interpersonal problems sometime over the semester:
a) difficulty contacting group members
b) feeling that your opinions were not considered
c) feeling that you had to take the leadership role to get anything done
d) difficulty taking or receiving feedback from team members
e) insufficient brainstorming
f) inflexible positions on the part of team members
g) defensiveness on the part of team members
h) misunderstandings due to unclear expression of ideas
i) misunderstandings due to poor listening.

Experience has also shown that some groups will encounter some of the following organizational problems sometime over the semester:

a) difficulty agreeing on a shared vision
b) failure to clearly define responsibilities
c) failure to divide tasks equitably
d) failure of some individuals to carry out what they had promised
e) difficulty adjusting to change when reevaluating plans seemed advisable.

Part of my Jan. 14 lecture will address such problems and strategies for dealing with them.

GROUP BRAINSTORMING SUGGESTIONS (Courtesy of Lil Blume)

Three Improvisational Skills Needed for Effective Brainstorming

1. **Flexibility:** In the brainstorming phase, don't get too attached or rigid about any idea.
2. **Fearlessness:** Put your doubts and inhibitions aside and say whatever comes to mind.
3. **Attentive Listening:** Someone may have just a scrap of an idea. Build on it. Write it down. Use it later.

Seven Guidelines for Brainstorming

These guidelines are particularly important when you have formed your final group and you are working out the details of your project.

1. Give everyone the chance to suggest ideas.
Have group members call out ideas and later have them give their ideas and opinions in sequence.

2. Disallow criticism during the initial phase.
All suggestions should be welcome.

3. Encourage freewheeling.
Outlandish ideas often prove quite useful. It's easier to tame a wild idea than to originate one.

4. Encourage quantity and variety.
The greater number of ideas put forth, the greater the likelihood of a breakthrough idea.

5. Encourage combinations and improvements.
Building upon the ideas of others, including combining different ideas is very productive. "Hitchhiking" or "piggybacking" is an essential part of brainstorming.

6. Take notes.
When your final groups are formed, keep records of every brainstorming session. Ideally you can rotate this job among all members. Decide at the beginning of the meeting who is the notetaker.

7. Do not follow any suggestion too rigidly.
Brainstorming is a spontaneous group process.

Three Things to Say While Brainstorming to Shut down Communication

1. That's dumb.
2. That'll never work.
3. I don't think so.

Three Things to Say to Open up Communication
1. Go on.
2. What do you mean?
3. What else were you thinking?

Two Things to Say When it Seems That Your Opinions Were Not Considered
1. I can see your point about...., but let me repeat my previous idea and perhaps you can tell me why you think it won't work.
2. I won't feel right going ahead with that unless we consider this idea as well.

Three Things to Say When Someone's Ideas Seem Unclear
1. I'm not sure I understand what you mean. Could you explain it again?
2. Can you draw me a picture?
3. So you're saying..... Is that it?

*One frequently cited frustration among group members is misunderstandings due to unclear expression of ideas. Listeners must let the speakers know when they do not understand. Even if you think you **DO** understand, it is wise to seek verification.*

WHAT EACH GROUP SHOULD HAND IN FOR ASSIGNMENT 1b

Carry out the task described above, write it up as a plain text document, and submit it to **the course newsgroup by Monday afternoon January 20th. The posting should have a descriptive title, e.g., "Navigating Public Transit" or "Nurses Connected via the Net", and not "Assignment 1b" or "Frank Chang"**.

Many of the groups will have thought of several ideas, and be legitimately uncertain whether they have picked "the best one". This is OK, and it is still possible for a while to change your topic if you later decide you have a better idea. To facilitate dialogue with your TA about this dilemma, should it arise, you may want to include a note on your submission such as: "Two other interesting ideas we have considered are "xxx xxx xxx" and "yyy yyy yyy".

Please give the names of your team members and their email addresses in what you submit to the listserv. This is particularly important if your team does not contain 4 or 5 people.

Finally, you should also submit, as a separate email attachment to Kelly Rankin, the following form. This form describes your group, which should be comprised of 4 or 5 people. The information in the form will be helpful to your group and to your TA.

CSC318F Group Identification Form — 20 January 2003

Project Name _____

	Person A	*Person B*	*Person C*	*Person D*	*Person E*
Name					
Phone Number					
Email					
Best times for meetings?					
Writing skills?					
Organizational skills?					
Research skills?					
Behavioural/ social science background?					
Visual design background?					
System/ interface prototyping background?					
Special areas of interest?					
Anything else your team should know?					