Application for Ethics Approval for Human Subject Research
(please refer to the Application Guidelines (www.mcgill.ca/researchoffice/compliance/human) before completing this form)

Project Title: Assistive Technologies for the Blind and Visually Impaired

Principal Investigator: Cooperstock
Dept: ECE

Phone #: x5992 Fax #: x7348
Email: jer@cim.mcgill.ca
(students must provide their McGill email)

Mailing Address (if different than Dept.):

Status: Faculty _x_  Postdoctoral Fellow ___  Other (specify) ______
Ph.D. Student ___  Master’s Student ___  Undergraduate ___

Type of Research:  Faculty Research ___  Thesis ___
Honours Thesis ___  Independent Study Project ___
Course Assignment (specify course name and #) _ECSE 424/689 ______
Other (specify) ____________

Faculty Supervisor (for student PIs):

Co- Investigators/Other Researchers (list name/status/affiliation):

List all funding sources for this project and project titles (if different from the above). Indicate the Principal Investigator of the award if not yourself.

Awarded: N/A
Pending: (possibility of funding from Ministère des services gouvernementaux for a related project that would deal with the same population)

Principal Investigator Statement: I will ensure that this project is conducted in accordance with the policies and procedures governing the ethical conduct of research involving human subjects at McGill University. I allow release of my nominative information as required by these policies and procedures.

Principal Investigator Signature: ____________________________ Date: ___Nov. 28, 2012__________

Faculty Supervisor Statement: I have read and approved this project and affirm that it has received the appropriate academic approval. I will ensure that the student investigator is aware of the applicable policies and procedures governing the ethical conduct of human subject research at McGill University and I agree to provide all necessary supervision to the student. I allow release of my nominative information as required by these policies and procedures.

Faculty Supervisor Signature: ____________________________ Date: ______________

Submit to Lynda McNeil, Research Ethics Officer, McGill University, 1555 Peel Street, 11th floor, Montreal, QC H3A 3L8
tel: 514-398-6831  fax: 514-398-4644  email: lynda.mcneil@mcgill.ca
1. Purpose of the Research
Describe the proposed project and its objectives, including the research questions to be investigated (one page maximum). What is the expected value or benefits of the research? How do you anticipate disseminating the results (e.g. thesis, presentations, internet, film, publications)?

This proposal deals with a series of projects to be carried out by students in the PI’s class on Human-Computer Interaction (HCI) (www.cim.mcgill.ca/~jer/courses/hci). The class is based on a semester-long project, conducted by the students in groups of three or four, applying the concepts from user-centered design to a real world problem. The project life cycle includes conceiving, prototyping, implementing, testing, and refining an interactive computer-based system for a specific population. Ideally, these systems will offer something new rather than simply provide a capability that is already readily available through existing technologies.

For this semester, repeating a concept we applied in 2010, and refined through discussions with a colleague at Centre de recherche informatique de Montréal (CRIM), working in conjunction with the Institut Nazareth et Louis-Braille (INLB), the PI is proposing to focus the HCI class on design and prototype development of assistive technologies for the blind and visually impaired communities, henceforth, simply, visually impaired. The suggested focus for these projects will be on technologies that facilitate entrainment of environmental awareness, possibly for those with recent onset of vision loss.

It is uncertain as to what, if any, benefits will accrue to these communities, as we cannot anticipate a priori the range of topics to be proposed by the student groups or the level of success they will achieve in realizing their objectives. However, the PI, as instructor, was impressed with the outcomes from 2010 and is optimistic that, at the very least, the efforts of the class will serve as useful guidance for collaborators at the INLB, who are considering a funding application to support such activities later in the year. Dissemination will be initially through the students’ “project notebooks”, maintained on the course web page noted above. However, it is possible that successful projects could advance to academic publications.

It is important to note that these projects, and indeed, the entire HCI class, are not meant to evaluate the performance of human subjects, but rather, test some technology’s ability to meet a certain objective in facilitating user interaction. Awareness of this fact, which is repeated frequently throughout the course, is imperative to install the appropriate mindset.

The results of these projects will be intended primarily for the students’ course requirements. However, some groups may be motivated to submit their results for publication in an academic conference or journal, in which case, confidentiality of participants’ information will be maintained, as described in Section 6.

2. Recruitment of Subjects/Location of Research
Describe the subject population and how and from where they will be recruited. If applicable, attach a copy of any advertisement, letter, flier, brochure or oral script used to solicit potential subjects (including information sent to third parties). Describe the setting in which the research will take place. Describe any compensation subjects may receive for participating.

Although the PI has an existing pool of visually impaired volunteers from a related, ongoing research project, recruitment of subjects for the HCI course projects will be coordinated by colleagues at the INLB and possibly the MAB-Mackay Rehabilitation Centre. Potential subjects should be willing volunteers with suitable time availability, tolerance for interaction with...
undergraduate students, agreement to be observed using technology prototypes, and able to provide feedback to the students throughout the process.

The project activities involving the subjects may, in theory, take place anywhere the subjects spend time and where assistive technology may play a useful role. An obvious target location would be in the subjects’ homes, but we need not confine the projects only to private residences, as there are ample and likely rich, unexplored opportunities to consider such technologies for public transportation, grocery shopping, or participating in community events.

Given the nature of the project, no compensation will be offered to subjects for their participation. This will be explained at the outset.

3. Other Approvals

When doing research with various distinct groups of subjects (e.g. school children, cultural groups, institutionalized people, other countries), organizational/community/governmental permission is sometimes needed. If applicable, how will this be obtained? Include copies of any documentation to be sent.

Such approval has already been obtained informally by the PI through contacts with the INLB and from the CRIR for an ongoing, related research project, In-Situ Audio Services (ISAS), conducted with members of Montreal’s visually impaired community.

4. Methodology/Procedures

Provide a sequential description of the methods and procedures to be followed to obtain data. Describe all methods that will be used (e.g. fieldwork, surveys, interviews, focus groups, standardized testing, video/audio taping). Attach copies of questionnaires or draft interview guides, as appropriate.

This process would begin with one or more initial briefings by usability experts from the Institut Nazareth et Louis-Braille, providing background and context deemed relevant for the students to understand before interacting with the community, so as to start from an informed basis and address common misconceptions. In parallel, members of the visually impaired communities who have volunteered to participate in this project will be informed by our lead contacts and by the PI that this is a class project rather than a purely directed research activity. We will caution from the outset, and repeat as warranted, that the participants should maintain low expectations for the results of these projects. This will be explained by noting that the projects are being conducted largely by undergraduate students in the limited timeframe of a one-semester course, and for whom the purpose is not purely technology development but largely attaining certain pedagogical outcomes.

As a second step, the students will conduct some observation of at least one member of the visually impaired community, possibly taking place in an exploratory task in an unfamiliar location, supervised by a mobility specialist from the INLB.

Based on the understanding that the students gain of the challenges faced by a visually impaired individual carrying out these activities, they would then develop their project proposals. The proposal describes the design of a system that could facilitate one of these activities and is ordinarily vetted by the TAs and instructor. However, as the Department of Electrical and Computer Engineering has refused to provide TA support for the course due to budgetary constraints, representatives of the INLB and CRIR will also be asked to provide their feedback. Project proposals that are not deemed acceptable at this stage will need to be revised.

Next, there will be a proof-of-concept stage in which the students demonstrate the feasibility of developing the system, at least in prototype form, based on available technology. Some modifications to the proposed idea might be necessary at that stage in order to ensure that the project is of reasonable (feasible) scope for a one-semester project.
Following the demonstration of feasibility, the students will then proceed through several iterations of building increasingly capable versions of the technology. This would begin with non-functional "mock-ups" for exploring the basic concepts of interaction, followed by very limited computer-based implementations for validating the interactive concept, and eventually, by the end of the semester, to a "real" working system. These systems would be tested at each stage of development, with the user feedback guiding revisions to the design as the development proceeds.

5. Potential Harms and Risk

a) Describe any known or foreseeable harms, if any, that the subjects or others might be subject to during or as a result of the research. Harms may be psychological, physical, emotional, social, legal, economic, or political.

Foreseeable harms could arise if the students developed technologies lacking safeguards that were relied upon by the user community for navigation or any other task that exposes the users to potential dangers. As such, we will explicitly discourage projects that appear to pose such a risk.

As a general guideline, cautionary notices would be provided to users, reminding them that the technologies are prototypes, having undergone limited testing, and should be used with this in mind. The approach adopted by the PI and his research team for dealing with technologies for the same community in the related ISAS project may be instructive. Specifically, we provide, throughout the early stages of operation, various "cautionary reminders" to users each time they begin their interactions with the technology, that the technologies should be treated as early prototypes and not reliable or trustworthy.

b) In light of the above assessment of potential harms, indicate whether you view the risks as acceptable given the value or benefits of the research.

Yes, the risks are acceptable. The harms outlined above, once navigation assistance is precluded as a possible project topic, are in general on par with those faced every day during normal activity and interaction.

c) Outline the steps that may be taken to reduce or eliminate these risks. If deception is used, justify the use of the deception and indicate how subjects will be debriefed or justify why they will not be debriefed.

As described above. Moreover, abstracts of the individual student project proposals will be forwarded to the REB by the end of January to provide further details, as these are available, and ensure that no issues of concern are raised.

6. Privacy and Confidentiality

Describe the degree to which the anonymity of subjects and the confidentiality of data will be assured and the specific methods to be used for this, both during the research and in the release of findings. This includes the use of data coding systems, how and where data will be stored, who will have access to it, what will happen to the data after the study is finished, and the potential use of the data by others. Indicate if there are any conditions under which privacy or confidentiality cannot be guaranteed (e.g. focus groups), or, if confidentiality is not an issue in this research, explain why.

All the personal data obtained from these projects, including the analysis of usability test results and subjects’ profiles, will be maintained confidentially by each student group. No nominative information of the participants will be included in the documentation; subjects will be referred to only by their initials.
Any use of photographic, audio, or video documentation will be discussed thoroughly with all participants to ensure that these are acquired only with informed consent (see below). Any such documentation accessible through a web server will be kept in a password protected location.

In the first two weeks of class, the students will be given a copy of this application for ethics approval and asked to sign on to these terms of privacy and confidentiality as co-investigators.

7. Informed Consent Process

Describe the oral and/or written procedures that will be followed to obtain informed consent from the subject. Attach all consent documents, including information sheets and scripts for oral consents. If written consent will not be obtained, justification must be provided.

The following informed consent document will be made available in advance to prospective subjects. Willing volunteers will be asked to provide consent through the INLB project liaison:

We are requesting your consent to take part as a voluntary subject in our class project on human-computer interaction. Our intent is to observe and test the assistive technology prototypes we develop in a meaningful, real-world usage context, and to do this, we need to work with members of the visually impaired community. Although we will be observing you, as a subject, it is important to note that we are not testing you, but rather, our designs and the capability of the prototypes we develop.

This project will run from late January until early April. The time demands are fairly minimal; likely in the order of an hour or two every two weeks, and we would coordinate with you to ensure minimal disruption to your schedule. As such, we would like to request your consent to take part as a subject in this project. You may withdraw from the project at any time.

Throughout the project, it will be most valuable to us if we can make use of audio, photographic or video recordings to study your interaction with the various technology prototypes and to save your comments for later discussion within our group. If you consent to our making such recordings, we will inform you every time we start and let you know when we have finished. These recordings will only be available to other members of our class and instructor, and to our project liaison at the INLB, through a password protected web page. You will not be identified by name in any of these materials and you can ask us not to make available any recording or remove any recording that you do not wish to be made available.

Should you have any questions concerning this project, you may contact the course instructor:

Prof. Jeremy Cooperstock  
Dept. of Electrical and Computer Engineering, McGill University  
3480 University Street  
Montreal QC H3A 2A7  
Tel: 514-398-5992  
Email: jer@cim.mcgill.ca

If you have any questions or concerns regarding your rights or welfare as a participant in this research study, please contact the McGill Ethics Officer at 514-398-6831 or lynda.mcneil@mcgill.ca

8. Other Concerns

a) Indicate if the subjects are a captive population (e.g. prisoners, residents in a center) or are in any kind of conflict of interest relationship with the researcher such as being students, clients, patients or family
members. If so, explain how you will ensure that the subjects do not feel pressure to participate or perceive that they may be penalized for choosing not to participate.

N/A

b) Comment on any other potential ethical concerns that may arise during the course of the research.

N/A