PORTAGE LOGS

A CANADIAN MOBILE EXPERIENCE

Ontario College Of Art & Design
http://www.mobilelab.ca/portage/

PART 1:

September 2007

CICADA SWARM TECH SPEC

Feedback installation consisting of EMF (and other) sensors that detect the presence of users with mobile phones. A feedback display will be activated when users enter into a specified zone within John Street and Grange Park.

Design Steps, Iteration I:

1. Sensing Range: test sensing equipment in urban/park setting to determine range of effective detection (range of devices, distances, interference, etc.)

2. Mapping: determine optimum test areas based on high-traffic and create sample measurements for prototype testing

3. Triggering: create hardwire patch between sensor and central controller; interpret signal for detection strength

4. Displaying: create mechanisms to provide visual and/or audio feedback

5. Activating: create linkage between central controller and brood controller

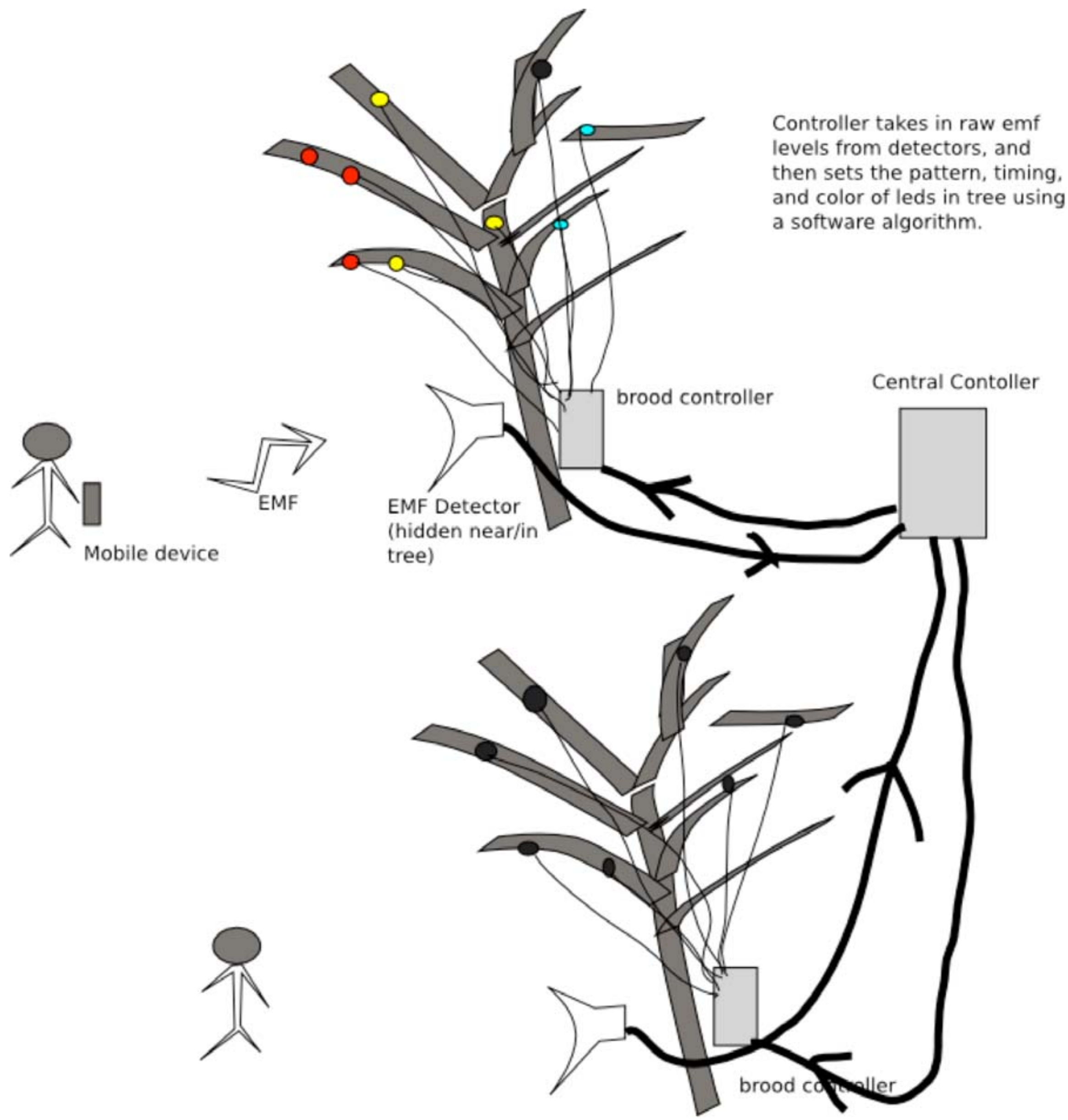
6. Pattern Responses: develop algorithms to correspond with sensor data

Overall Architecture:

1. User walks through urban/park setting and passively engages in sensor-driven feedback loop.

2. Multiple locations can be installed along a path, that causing distinct patterns to be displayed. User, if he/she becomes aware of the interaction, can cycle through the installations to create his/her own series of feedback loops.

3. Future Iterations:
   - Proximity sensors that can detect presence (this data can be compared to EMF sensors to determine whether a user has a mobile device or not)
   - Users can select the kind of feedback loop that is displayed



Controller takes in raw emf levels from detectors, and then sets the pattern, timing, and color of leds in tree using a software algorithm.
brood controller
Central Contoller
EMF
Mobile device
EMF Detector (hidden near/in tree)
brood controller

VIDEO PORTAL TECH SPEC

Interactive installation consisting of multiple video projections displaying time-based media (videos) whose behaviour (timing, order, volume, editing) can be controlled through motion. Motion is used as a 'natural' interface that allows users of multiple levels of computer/mobile literacy to access content.

The user will be able to control the video behaviour with a modified Wii controller (first prototype) or SunSpot sensor (second prototype), camera-phone (third prototype) or other Bluetooth-enabled devices (future prototype).

Iterations:

1. Play/Stop video: allow control of playback through manipulation of accelerometer sensor

2. Edit between videos: switch between simultaneously running video streams

3. Slow down playback: affect video stream to create slow-motion effect and/or reverse playback (enabling user to 'scrub' or search video for desired location)

4. Volume control: affect volume of one stream over another

5. Multi-screen control: affect streams on located on multiple screens

6. Future iterations:
   - Implement high-resolution accelerometer support (SunSpot sensor)
   - Implement camera-phone gyroscopic program to control video

Overall Architecture:

1. User affects the playback of a wall of video projects (or other display) using either a Wii controller, a custom-built controller (SunSpot), or a camera-phone.

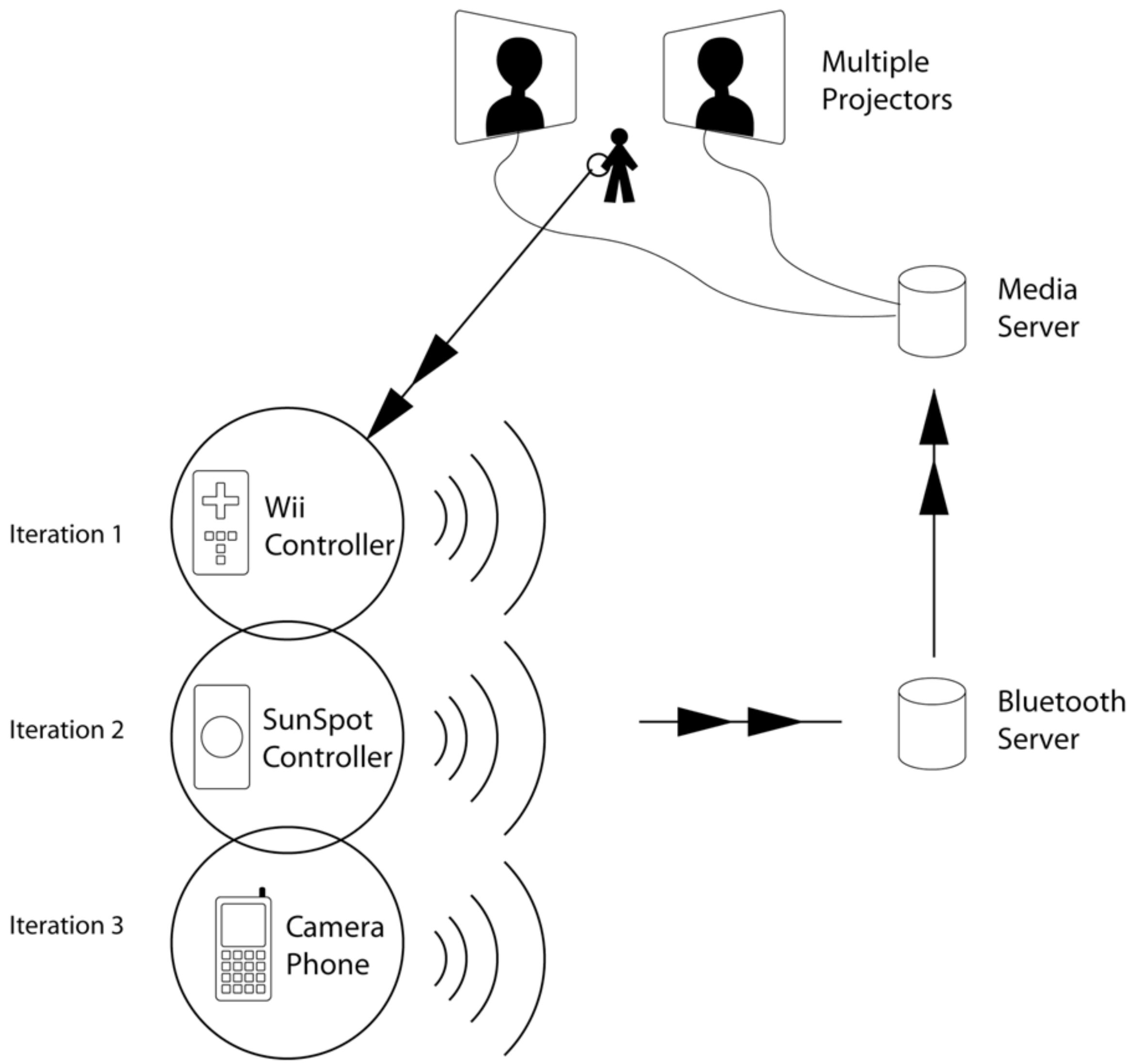
2. User with either Wii controller or custom-built controller will not require special software to control the installation.

3. User with camera-phone will need to download camera-gyroscope application to control the installation.

4. User's movements are translated into x, y, z coordinates of 3D space. These measurements are mapped onto corresponding control actions (play, stop, source A/B, volume, reverse, etc.)

5. Bluetooth server receives data broadcasted by controller and creates a patch to the video controller software on one or multiple computer/projector units.

Video Portal Schematic



WALL OF SOUND/SOUND SCULPTURE TECH SPEC:

Interactive installation consisting of an assemblage of objects whose behaviour could be physically manipulated by users via their mobile devices and/or by physical manual action.

Iterations:

1. Manual Action: Various percussion instruments are available on a sound sculpture that users can activate through physical manipulation.

2. Bluetooth Version:
   Users download a Bluetooth application for their Bluetooth-enabled phone, which will feature a GUI by which they can issue commands to a Bluetooth server

3. EPBX Version:
   Users without Bluetooth-enabled phones can issue commands to the wall by dialing into an EPBX server, which will process touchtone-based commands.

Overall Architecture for Mobile-Activated Use:

1. User chooses an object on the wall using their mobile device (using a Bluetooth application downloaded from the wall, or by dialing into the EPBX server)

2. User 'plays' the chosen object using their mobile device (using a GUI interface for Bluetooth version, or by using the device's buttons for the EPBX version)

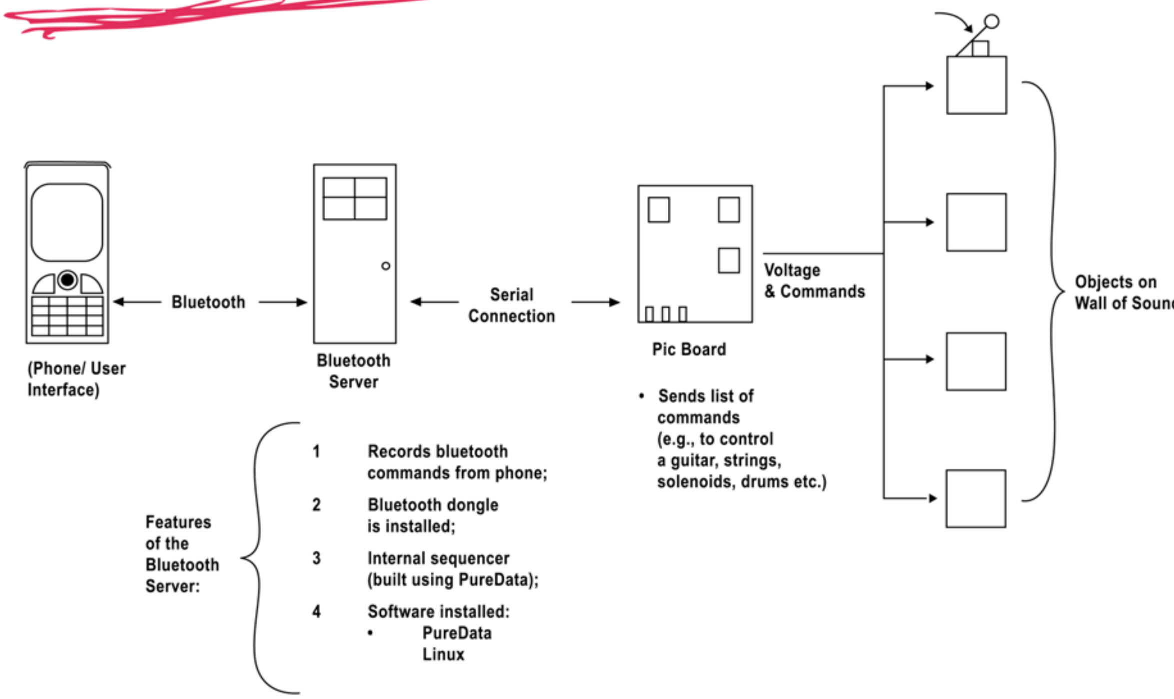
3. User's actions are translated into commands that are then sent to the control server (which contains both a Bluetooth Server and an EPBX server). The server processes the commands using a PUREDATA application and deploys instructions to the PIC hardware via a serial connection

4. PIC hardware sends commands to physically control/affect the chosen object on the wall. Example: if a user programs a sequence of beats on their mobile device to control a drum instrument on the wall, the PIC board would turn a solenoid on and off, causing it to strike the drum in the rhythm pattern specified by the user.

Future Iteration Plans

Iteration 4. Users will record produced music/sound on the mobile phone and download it to the phone. Users will be able to pass the sound on to other users who can then hear the sound on their phone, or share it with another user.

WALL OF SOUND



I-SPY TECH SPEC:

A video surveillance-like experience in which users can, in real-time, review content (e.g. their own images) captured by video cameras inhabiting the environment via their mobile devices. This real-time camera footage will also be blended with historical images from different periods in the city's past, placing the user in the middle of another event.

Overall Architecture:

1. Network-enabled camera streams captured video footage constantly to control server

2. Server performs post-processing on video stream (e.g. image blending and filtering), and sends it to user's mobile device

3. User receives video on his mobile device (which is updated in real-time)

Communication Schemes:

1. WiFi Version:
   Users with WiFi phones can access the video streams using WiFi connections to Ontario Hydro One-Zone hotspots

2. GPRS Version:
   Users with non-WiFi phones can retrieve the video streams over their cellular network via GPRS

Types of Video Streaming:

1. Still Image Sequences:
   Server sends camera footage to phone using a constantly updated sequence of still images (result will resemble a flip-book)

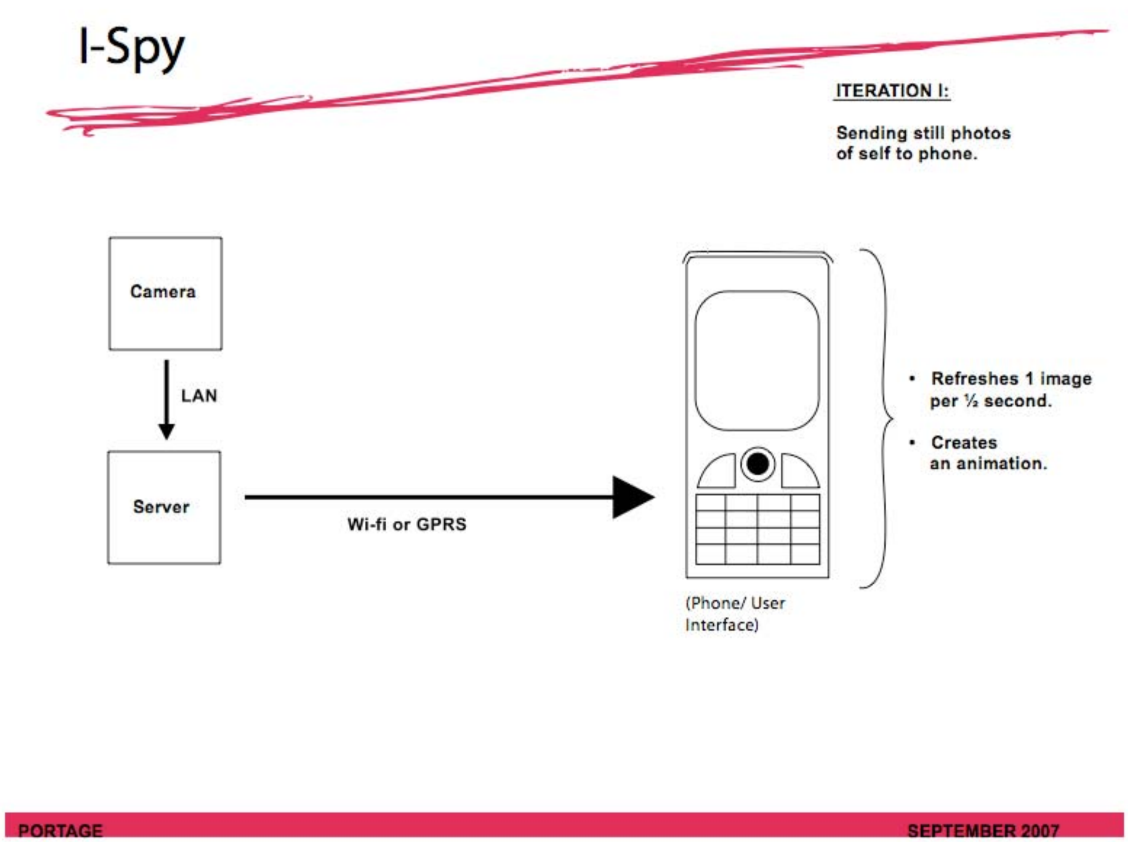
2. Real-time video:
   Real-time video streaming using a Java or Processing interface, via RTSP protocol. A streaming server is required for this configuration

Types of Image Post-Processing:

1. Image filters
   I. Desaturation (color to black & white)
   II. Image Grain
   III. Color Adjustments/Manipulation

2. Image Blending
    I. Blending two videos/image by varying alpha levels (transparency)
    II. Isolating components of one video (e.g. a human form) and inserting them into a second video

Technologies/tools to be used for image processing:
ImageMagick, NetBPM, Processing



LOGS: Part I

The LOGS below constitute part I of our LOGS handbook, which tracks the development of various projects, including attempts, mistakes and redresses. The LOGS are kept on an ongoing basis by each team member involved with technological development.

Cicada LOGS:
Fairly preliminary in hardware choices to date. Currently planning on using very low cost PIC-based smart nodes; however, need to get further along in building and testing actual hardware to determine if those choices are correct.

LOGS by Peter Todd

Wall-of-stuff LOGS:

Built a pure data based demo to control a PIC-based hardware solenoid control board. The PIC side of things was a minor affair and can be done in many different ways. Need to investigate what existing hardware can provide this functionality, such as MIDI stuff. Pure data as a drum machine is surprisingly tricky to set up; unsure if the interface will meet the goal of giving non-programmers any hope of modifying its functionality.

LOGS by Peter Todd

Low-tech telephone interface LOGS

Voice-over-IP seems to be the ideal way to interface to low-tech telephone DTMF tones and voice communication. Essentially the same level of technology as used in automated menu systems. Voice over IP allows someone else to deal with the complexities of interfacing computer hardware to the telephone system. SIP accounts are easily obtainable for $5-$20 a month for a single number, also known as a DID, usually with the ability to have multiple callers at once. On the software side of things, evaluated some open source VOIP libraries; no clear winners, but pjsip was successfully used for a demo. To do will be to investigate interfacing pure data to VOIP.

LOGS by Peter Todd

I-Spy LOGS
Built a prototype of the I-Spy application, using WiFi as delivery method, and real-time updated still images to stream video. Mobile device connects to a webpage on the Apache web server via built-in web browser, which sends a continuous stream

of still images every 0.5 seconds. I used the Nokia N95 (a WiFi-capable phone) for testing. Image refreshing is still a bit rough, due to variations in WiFi connection strength and file size of the sent images.
Currently investigating ways to make image refreshing smoother, e.g. reduction of image file size by diminishing color depth, or by using black & white images. ImageMagick (an image filtering library) has also been installed on the server, and its image blending capabilities (superimposing streaming camera footage onto a sample historical image) are currently being tested.

LOGS by Ken Leung

Portal LOGS

Prototype concept involves the integration of voice recognition, text analysis and video playback engine to create an interactive video installation.
Preliminary tests in the creation of a text analysis engine (custom built in Java) proved successful to drive the selection of video clips to be played.
Preliminary tests in voice recognition using open source software (Sphinx) revealed that extensive work is required to 'teach' the engine and extend the library of recognized words.
Difference in microphone models proves to greatly affect the accuracy of voice recognition.
Latency issues in processing of speech and text analysis seem to be a roadblock to creating a responsive user experience.
'Natural' interface for interactive video installation is shifted to movement rather than voice in order to address latency, accuracy and platform issues discovered during testing.
Initial tests are made with Wii controller and OSC (Open Sound Control) protocols via Bluetooth connection.
Visual model of a Wii-embedded physical model is created as proof of concept for a 'natural' interface that works on a similar level as voice (non-digital user interface).
Work is done on the receiving x, y, z (roll, pitch, yaw) measurements from Wii controller's accelerometer sensor
Accelerometer data is translated into playback controls:
play/stop
edit between videos
playback speed and direction
volume control
multi-screen control is explored with multiple sensors

Portal Proof of Concept LOGS

Built a proof of concept application for Portal,
which parsed a text file containing a 100-word short story,
and output a sequence of images that corresponded
to the words in the story, thereby translating the story
into visual form. To accomplish this, I created a Java application
which would break the story down into individual words, and
built a database of images (using MySQL database). For each constituent
word, the application would search the database for a matching image,
and output it to a row on an HTML page if found. Therefore,
after all words were processed, the HTML page would contain a sequence
of adjacent images presented in the form of a filmstrip.
I also began research into the Sphinx speech-to-text engine,
which would be integrated into the next prototype, where the text output
of the engine would be piped into the Java application in place of the
100-word story. Currently researching how to unlock the full capability
of Sphinx, as the out-of-the-box version works with a considerably
limited dictionary of words.

Portal Project: User Interaction Scenarios
Based on recalling a last happy memory before a traumatic event—my design goal was to create a filmic and therefore nostalgic sense of memory by using black and white film and older formats such as 16mm and super 8 as a way to create the "texture" of memory. The original narrative would have been broken down into a series of medium shots of simple actions creating filmic "ideograms" that could be rearranged in various combinations to create different interpretations of the same story. Participants would be prompted to retell the narrative in their own words, the changes in the story would be tracked. When this iteration of the project was abandoned, the team worked to create the concept design for the second iteration of the Portal project; I developed the subject matter and created content--shooting and editing the video and audio texts the Wii controller allows the viewer to navigate.

LOGS by Patricio Davila and Jennie Ziemianin, Ken Leung and Brenda Goldstein

DAMMP: TECH SPECS AND PROJECT LOG:

May 2007

- ♣ Assessed possibility of using existing mapping technologies for the SEIM tool (Google Maps and Flickr geotagging), but rejected them due to:

1. limited customizability and therefore not responsive enough to ongoing researcher needs
2. limited ability to tag, store and display a wide range of data types (text, image, video, audio)

♣ Decided upon a custom-built Flash interface, with a dynamic tagging features, and ability to display multiple map layers (1800's historical map, current map)

June 2007

♣ Created a graphical map of the John St corridor (Jennie)
♣ Assembled a merged historical map from Toronto Archives (Jennie)
♣ Compiled and grouped list of research materials and documentation which we would use as tags in the tool:
locations of public technologies relevant to our installations (surveillance cameras, video screens, loudspeakers), research documentation (photographs, field notes, audio recordings, video clips), and locations of relevant landmarks (public art installations, buildings of note, trees that could be used for mounting of project pieces)
♣ Designed icons for each tag

July-August 2007

♣ Created a map interface (in Macromedia Flash), based on components gathered in June
♣ Created locational tags for the compiled list of research items, and populated them onto the map interface.
Tags would display thumbnails of content (e.g. photo) when moused over, and open larger versions when clicked
♣ Created a clickable legend that would turn the visibility of each tag type on and off
♣ Added feature that would enable the user to overlay an 1800's historical map of the area over the present map, at 10 different levels of transparency

LOGS by Jennie Ziemianin, David McIntosh and Ken Leung


Dundas Street
Grange Avenue
McCaul Street
Beverly Street
Sullivan Street
Phoebe Street
Stephanie Street
Soho Street
Renfrew Street
Queen Street
Richmond Street
Nelson Street
John Street
Adelaide Street
Pearl Street
King Street West
Mercer Street
Wellington Street
Front Street
map layers
street names
historical + -
public technologies
surveillance cameras
video screens
loudspeakers
documentation
photographs
field notes
audio
video
landmarks
trees
public art
buildings