CMPUT 302 W14

Project Design Milestone

Feb 7th, 2014

Augmented Pen & Paper Interface

Team 4

Group Name: Pen & Paper

Group Members: Ashley Dawn Brown, James Cadek, Gerald Manweiler, Eddie Tai

Division of Labour:

Ashley Dawn Brown – experimental testing methodology

James Cadek – time management, paper protoype

Eddie Tai – online documentation, heurisitic analysis

Gerald Manweiler - administration, client liaison, client needs/constraints analysis

Project Description:

The main objectives of this project is to capture and digitize graphical and/or textual annotation on a paper geographic information system map, and be synchronized with relevant audio and & video information.

The project source is Trevor Wiens of Apropos Information Systems. His goal is to use it with his product LOUIS Heritage, a tool to help indigenous people to preserve, protect and promote their traditional knowledge and values. LOUIS Heritage allows text, maps and media files to be stored and used together.

The project is scientifically interesting because a portable integrated media geographic information data capture system, based on tracking an infrared dot on a paper surface, does not currently exist and could be beneficial to many other scientific fields.

The system should work by using tracking and geo-referencing an infrared dot from a pen on a paper geographic information system map. When a feature is marked on the map, an audio recording of the unique feature id will be made. The aim of the system is to be extremely portable, requiring only a paper map, a laptop computer with microphone, an infrared pen and infrared tracking hardware, and a video camera.

The physical component of the interface will be infrared tracking hardware, in the form of an infrared pen and wii remote. The software component will feature a simple interface that lets a user enter basic session info on a laptop (map number, interviewer, interviewee(s), date & time), an interface to calibrate the infrared pen to the geographic information map, and an interface to capture audio for synchronization to the infrared annotations on the map.

Evaluation of Interface:

The main forms of evaluation of this project will be:

* Ease of use and start up time for preparing a session
* The motion tracking resolution (our client specified a 1mm accuracy goal)
* The versatility of hardware positioning
* Ease and accuracy of calibration

Experimental Testing Methodology

Client Need Analysis

* The client wants to reduce manpower costs from a multi-person interview team to a one person interview team.
* The interviewer will be an anthropologist or archeologist.
* The interviewee will be a First Nations person.
* The client wants to digitally capture and geo-reference annotations made on a paper GIS map. Resolution of 1mm required on 1:50000 scale maps.
* The client wants to verbally anchor map annotation with audio recording of unique feature id of map annotation. This will be used by the Natural Language Processing (NLP) functionality of the client’s product LOUIS Heritage (Land Occupancy and Use Information System) to integrate map annotation.
* The client needs map/audio session data saved in a format compatible with the client’s product LOUIS Heritage.
* The client has specified the laptop operating system must be a current Microsoft product.

Constraint Analysis

* All hardware and software setup for an interview session must be done by the interviewer. Therefore, set up time should be minimal, on the order of 15 to 30 minutes.
* Furthermore, the interviewer is not an IT professional. Therefore, some, but not extensive, user training will be required. The training would consist of how to setup, calibrate and use the infrared tracking hardware, and how to record audio.
* Further corollary, the physical weight and size of the hardware should be in order of 2 cubic feet and 10 pounds weight.

Heuristic Analysis

http://en.wikipedia.org/wiki/Heuristic\_evaluation

<http://www.nngroup.com/articles/how-to-conduct-a-heuristic-evaluation/>

http://www.sitepoint.com/heuristic-evaluation-guide/

Need For Material

* Hardware
  + Laptop with integral microphone
  + Wii remote on tripod
  + Bluetooth USB dongle for Windows
  + Infrared pen
  + Paper GIS map, 1: 50000 scale
* Software
  + Wiiusej API (wii remote java interface)
  + Eclipse (integrated development environment)
  + Trello (time management)
  + Github (version control)
  + Windows 7 or Windows XP Pro SP3

Paper Prototypes