**Master’s Project Proposal**

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1. **Introduction** The field of human-computer interfacing is one that is ever-growing, as technology, along with the ways that we use it, is always evolving. Computers are becoming more mobile and integrated into our daily lives. Since we are adapting so quickly and becoming reliant on the use of mobile computers, the technology needs to adapt to this as well.   
    In their beginnings computers were primarily used by scientists in their labs but as time progressed, the technology trickled down into the business world, then into people’s homes with the PC, and now they are ubiquitous. Everywhere we go there are computers…they are essential to our economy, our infrastructure, our vehicles, and with the widespread use of mobile devices, they play a large role in our everyday activities. A new dynamic that is being introduced to the field of developing computers and software is the fact that children are now beginning to commonly have access to technology. Devices and their software are now being developed to cater specifically to children, and this is an interesting area that this project will explore.
2. **Project Description** This project will encompass multiple disciplines of Computer Science, mainly database design and implementation, as well as interface design. The whole idea is to create an application that is aimed at children that will allow them to take pictures and create geo-tags with description information to share with other children and create a social learning experience. For example, person could take a picture of a pine tree with a geo-tag of where they found it along with a short description, then other people that log in to the application will be able to log into the application and view other people’s tags, as well as add tags of their own. Eventually there is a web component to the overreaching research project, but that is beyond the scope of this Masters project.  
    While the overall goal of the research project is broad, the focus of my Masters project will be to implement the database and mobile interface with a focus on the social aspects of sharing information. When people use the application, they will have the option to create a username, and doing this will open up a whole new aspect to the program. Once they have created an account, the users can add other users to their friends list, which will allow them to share their tags with friends, and view things that their friends have shared. This also opens up the option for Groups and Group Tags, which could be useful in a classroom or research environment. For example, a teacher could create a group and assign a task to the users within that group. Those users could then go out and capture their tags, and share them back with the group. One final concept that I would like to introduce is the “Adventure”, which would allow a user to string together multiple tags in a logical order to share an “Adventure” with other users that they could then go replicate if they find it interesting, or add-on to.
3. **Implementation** My focus for my implementation is to lay the foundations for this project, with the intent of making the framework flexible enough so that it can be expanded upon in the future. First, I will be implementing the database that will store all of the data for this application, such as the user accounts, friend associations, tag data, etc. This will be a MySQL database, which as of now will be hosted on a Mac-Mini server in the HCI lab. This database will be built with future extensions to this application in mind so that the schema will allow for more functionality and also be easily extendible for new features.  
    After completing the database, there will need to be a way to interface with it from the various points of access that this project could eventually have. This will be done through a PHP script that will also run on the same server as the database. This script will be able to run queries/call stored procedures on the database to return data to the User Interfaces.   
    Finally, I will begin work on one user interface portion of the project—an Android application. This application will be designed with children in mind, so the interface will have a look-and-feel that will be oriented toward children, but also with the goal of being smooth and robust enough that users of any age could enjoy it. The application will allow users to manage their accounts, groups, and friends lists, as well as create and view tags. This will make use of the Google Maps API to assist in managing and creating location data for the tags. The Android application will call methods from the PHP script to retrieve (and send) the necessary data to and from the database, so most of the processing will be done on the server-side to reduce load on the Android device.
4. **Impact** The goal of this project is to develop an application specifically for children to help them develop both their technical and social skills. While there are technical achievements that need to be made for this project to be completed, the real measure of success will be with the user feedback. Will this application be simple (and enough for children to use on a daily Through the use of this application they will be able to learn how to use technology to both interact with other children and also gain knowledge in other areas through the use of the tags. The use of the groups will allow teachers or research leaders to use this application as a tool to help their students learn as well.
5. **Previous work**

Even though the widespread accessibility of computers to everyone has only really taken off over the past decade or so, the idea of focusing research specifically on children and computing is not new, and the information available is fairly widespread. One area that has been explored is the development of programming languages designed to be used by children. For example, in the 1960s, a programming language called “Logo” was developed with the purpose of education and research involving children. It used a robotic turtle to help teach children the basics of programming languages (What is Logo?). This idea was re-visited in 2005 by Microsoft’s Kodu project which is another programming language that was created with the intent of allowing children to explore the concepts of computer programming in a way that is engaging and also fun for them.

The fact that there are resources dedicated to teaching children about computer programming shows that there is an overall interest in the way that children interact with computers. The 2011 paper, “The Nature of Child Computer Interaction” explores this idea, and even defines a sub-field of HCI called CCI, or Child Computer Interaction (Read, Bekker 2011). This paper discusses the field of CCI as a whole, indicating how it generally differs from HCI and the general uses that children have for computers. In this paper, Read and Bekker state that “More than anything else - children’s computing is discretionary – the computer dissolves into the current activity.” This quote defines a major challenge in the CCI field, which is taking the focus off of the technology that is being used, and keeping the children engaged in the provided activity. I believe that this quote helps to define a goal of this project: to try to design an application that children will view as engaging and fun rather than as a chore or homework assignment. It should allow them to explore their creativity while developing social skills and becoming acquainted with technology at the same time.

1. **Future Work** As stated previously, the overall idea for this project is fairly flexible and there are many different possibilities for extensions in the future. The most obvious future work is the addition of other platforms. An IOS application to mirror the Android app for users of Apple products is a logical next step, and also a Web Interface could be developed to offer features that may be difficult for current mobile devices.   
    As far as functionality, this can be built upon to create more focused experiences for the user. Features such as scavenger hunt games or even individual or group assignments (with a way to submit them to a teacher/group leader) could be added to enhance what the application can do. Another feature that is being explored (that may make it into the initial implementation, if time allows) is the ability for children to create custom map overlays. Basically, rather than adding their tags onto a geographical Google Map, users would be able to either draw a custom map on their device, or create it in real life and take a picture of it, then use that to map out their tags and adventures.
2. **Milestone List**

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| **Target Date** | Milestone | Details |
| **1/14/13** | **Proposal Submission** | Project proposal submitted to committee for review. |
| **1/22/13** | **Project Document Submission** | Submit packet to Dr. Herbert containing signed documents signed by the project committee, as well as the independent study form. |
| **1/28/13** | **Main Component Outlines Completed** | Have Database diagram, outlines/descriptions of queries/stored procedures that will be needed, and preliminary interface sketches complete. |
| **2/11/13** | **Initial Database Schema Completed** | Have database schema implemented according to diagrams, create functions to fill it with test data for ease of testing later, and begin testing queries. The schema is subject to change throughout the implementation. |
| **2/25/13** | **Initial Script/Queries completed** | Have the initial script that will interact with the database completed, and have the main queries/stored procedures implemented. These will be subject to change as needed throughout the implementation |
| **2/25/13** | **Documentation Draft** | Database/Query Documentation, User Guide Preliminary outline |
| **3/11/13** | **Component testing completed** | The time between the last milestone and this date should be spent working on the interfacing of the components—make sure data can be passed smoothly between the android interface, the php script, and the database. |
| **3/18/13 and 3/25/13** | **Documentation Draft Updates** | Updated user guide draft with features implemented up to this point |
| **4/1/13** | **Android Interface Implementation**  **User Documentation Draft Complete** | Android interface should be mostly complete (all pages/components in place, no major bugs). This version should be usable enough to get feedback from test group.  Draft of user guide documentation should be complete, with only minor editing left to be done. |
| **4/15/13** | **Testing Completed** | Before this date, there should be some type of feedback from user-testing. I will not put a date on this now because this will be subject to availability, but results should be completed by 4/15 to allow time for necessary changes based on user feedback. Code testing should be largely complete by this time as well. The goal is to have by this date a stable release, even if it does not have all of the features originally planned. |
| **4/26/13** | **Final Changes complete, documentation drafts completed** | By this point, development and testing should be complete, and there should be an application that can be installed on user’s systems. Any software documentation (user manual/install guide/etc) should be completed by this time to be submitted to Dr Fails to allow for preliminary review. |
| **5/3/13** | **Final Draft Submission** | Submit final draft with electronic and hard copies to Dr. Herbert, along with form signed by the committee. |
| **5/10/13** | **Project Presentation** |  |

**References:**

*Kodu.* Microsoft Research Labs

<http://research.microsoft.com/en-us/projects/kodu/>

Read J., Bekker M. *The Nature of Child Computer Interaction*

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*What is logo?* Logo Foundation, 2011. Retrieved from http://el.media.mit.edu/logo-foundation/logo/index.html