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A Multitouch based e-book reading application

A Summer of Code **Proposal**
Prepared for Natural User Interface Group
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Abstract

I quote from the Multitouch Wikipedia article:

"**Multi-touch** is a human-computer interaction technique and the hardware devices that implement it, which allow users to compute without conventional input devices (i.e., mouse, keyboard). "

After the internet revolution, electronic books have become the order of the day; common medium to read favourite articles, books, research papers etc. On a usual PC/Laptop book-reading tasks like Zoom-In, Zoom-out, taking notes, looking up dictionary make the book reading a dull experience overall. The reason is Mouse/Keyboard being the only ways to interact with the computer.

I introduce a Multitouch application that can make reading electronic books more user-friendly and an intuitive experience. An additional client to convert usual .PDF e-books compatible to the MT application will also be developed.

Why ?

As I interpreted from the Ted and NUI videos, the future of computer interaction is going to be intuitive. Rather than using just keyboard and mouse gestures like touching multiple fingers to communicate will become more common.
Though online versions are available on internet people still prefer libraries/bookshops due to the ease of use while reading a paper-book.
The Multitouch user interaction will be the best solution to simulate a paperback book and make reading and

research even easier by providing tools like One-Touch Dictionary, page previews, drag and drop notebooks etc.

Bridging the gap between PDF (Portable document format) and HTML will be one of the main highlights in my project. Features like fixed-layout format used for representing two-dimensional documents (independent of the application software, hardware, and OS used) make it the De facto standard for electronic information exchange

Features	**Multitouch book**	**Usual e-book(.pdf/.chm)**
Page Navigation	-Move finger side to side :single page -Move *n* fingers: Takes you *n* pages forward/backward	Scroll up/down
Taking notes/scraps	Enclose the text in a circle [1], drag and drop to update notebook and autosave	Invoke external text editor, copy and paste
Interface	Resemble a real book Can view book in 3-D (see .swf)	Usual
Dictionary	Enclose a word in box, drag and drop to dictionary icon in interface	Minimize and open external dictionary to lookup
Added Features	Vocabulary enrichment game! [2]	None

[1]- Drawing an enclosed area like circle has issues. Mis-selection of text might happen. This has to be finalize after getting more know-how on MT techniques and mentor advice
[2]- An add-on game can Vocabulary enrichment game can be development, the game quizzes a person for the words he/she lookup the dictionary for.

How?

The **initiation** of the project will be done by making an interactive flash animation, which will demonstrate some of the features of the application. A basic demo of the application has been posted at greyhatindia.wordpress.com. This animation contains a demo book preloaded into its interface.

Since there is no direct way that a .SWF and PDF file can talk. I'll be using pdf2html technique to parse PDFs to work with flash. This will act as a gateway between the **flash and PDF**. The HTML pages obtained from the PDF will be accessed using AS 3.0
In the case of **scrapbook** (notekeeper) I can do with 2 toolbars : a content one and another containing a list of the notes. The user here achieves a lot without much effort.

Later on following functions may be implemented:

1. Ability to add notes – Draw , Drag, Drop (Autosave)
2. Ability to delete notes from list (via edit button, a minus icon by the title to delete)-similar to Iphone
3. Ability to sort notes

Anything more probably will begin to clutter up the screen.

Gestures like moving finger from side to side for page-flip, ignoring unintended touches, multi-finger touches for multiple page-flip will be defined and used.

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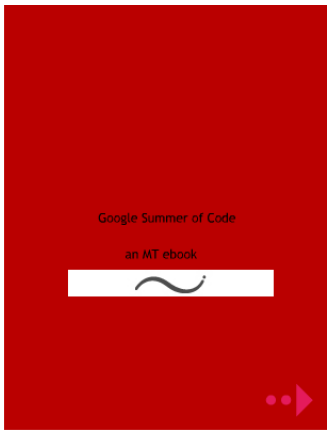
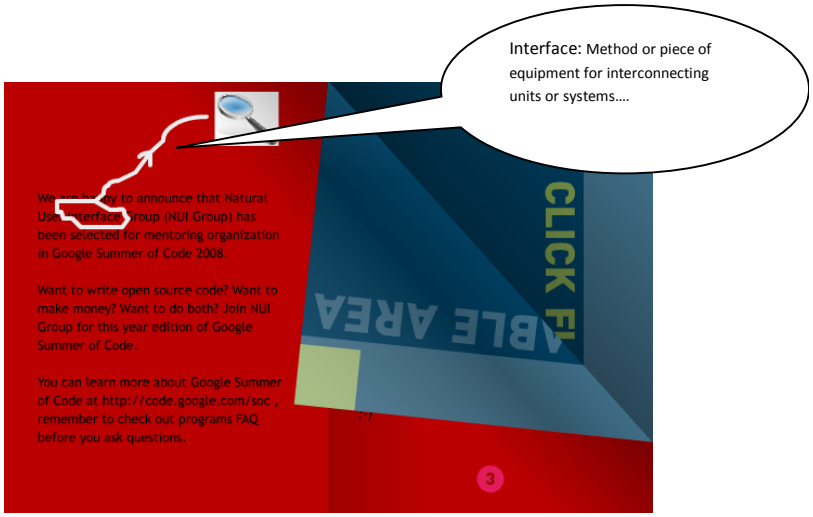
Dictionary feature can be implemented using **Wiktionary**'s API to fetch the selected word's synonym, which can be displayed as on screen while reading the book.(See diagram 2)

To summarize, here's what I'll be doing:

- Prepare the interactive book application in Flash AS3
- Test the application using TuIO simulator and keep the community updated about the progress. Community reviews will really help me improve upon my idea, this tool is being written for the community.
- Study and define gestures to work with my application
- Use Wikitionary's API to fetch synonyms of the words on screen
- Make the ebook app read PDF files. This involves programming a script to make PDF translate into HTML (or use opensource pdf2html technique). This is still to be finalized since the behavior of PDF files with the proposed application is still in question.



1.*COVER PAGE*



2.DRAG DROP TO DICTIONARY

3.PAGE FLIP

Timeline

- April 26- May 5: Get friendly and familiar with NUI community ;-)
- May 5- May 26: Familiarize with touchlib and AS3 specification, try demos using TuIO. Find hardware and start preparing the Multitouch table side by side

Phase I

- May 26 - June 20: Prepare a Flash 3-D interactive book GUI
- June 21- June 30: Take mentor/community review, make changes as per necessary
- June 30- July 5 : Test on Multitouch table. Discuss issues.

Phase II

- July 5 – July 20: Write client to parse PDF as a HTML: Flash has a good HTML support
- July20 –July 30: Take mentor/community review, test with various PDFs
- July 30-August 5: Code the book library feature. Various books at one time

Phase III

- August 5- August: Fix bugs; write random code, and documentation. Make mentors happy :-)

- Party!

Why me?

I am an undergraduate student at Rajasthan Technical University, Kota, India; pursuing my Bachelor of Technology in Information Technology. I have been involved with FOSS community for almost over two years now; I got introduced to NUI three months by a professor at a conference held in Delhi. Watching videos added to my excitement about such a technology which could only be a sci-fi topic couple of years back.

I have my basic design ethics, expertise at Flash and C++ programming experience. During high school I used Flash extensively to design intros for my school at competitions, so faced little problems in making the SWF demo for the ebook app.
Though I am new to the NUI Multitouch, I am confident that I will have no trouble in wading through the touchlib or TuIO source code. In any case, I grasp concepts and implement things pretty quickly; skills which I have displayed in all my previous and current projects, and this will be no exception.

Previously I have been contributing with nmap security scanner, deploying content management systems like Joomla, Drupal over blogsites.

OSS is something that is already quite dear to me, and I can assure you that I'll take full responsibility for maintaining the output modules from this project even after the Summer of Code completes. I take GSoC as an opportunity to "infiltrate" and bond with a new community.

Since I am already well-versed in the community interactions/dynamics of OSS projects, I will have absolutely no trouble in mingling with the NUI community and working with the infrastructure (Forums; Version Systems – I am familiar with CVS, SVN ; IRC etc.) already in place.

In other words, I can get started soon after getting shortlisted, giving me an effective coding time of almost 4 months, as opposed to the allotted 3. The time could be utilized in making the ever desired Multitouch table, fetching whose parts in India will take substantial time.

I sincerely hope that my work during the Summer of Code with Natural User Interface Group will eventually lead me to become a NUI developer - something that strongly desired after meeting that Professor!

Scholastic Achievements:

- **Selected in top 50 candidates from India of Intel IRIS science far. " Proposed a novel anti-spam algorithm" implemented in C++**

- **Silver Medal All India Rank 13 in National Cyber Olympiad**

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