

glBook & PlasticPage

human interface device resembling a book

INTRODUCTION

During my course work at the university I became interested in interfacing software and hardware, especially when it comes to untypical human interface devices. I've created a prototype of such an interface. This article describes it briefly. The project's main goal is to transfer advantages of a real book into the virtual world so that work with documents becomes more comfortable.

ADVANTAGES OF A TRADITIONAL BOOK

Although the computer is my primary tool, I prefer reading long documents on paper. A real book, apart from its mobility, has a couple of great advantages.

The longer one uses a book the more personal it becomes. The book starts to wear off, numerous stains and folds emerge. Thanks to that feature some favourite parts are quickly recognizable and one can navigate through a book more efficiently.

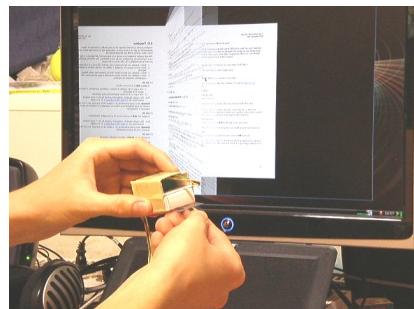
To flip pages quickly one can release them from under the thumb. The reader decides how quickly they flip in front of her or him. It is easy to find a chart, a diagram or an image when one comes to the reader's mind.

A real book gives an opportunity to easily annotate or even make corrections. One can write them at the margin or modify the text inline.

THE PRESENTED SOLUTION

The solution presented in this document is meant to extend possibilities one is given when reading a traditional book (a tangible object) with advantages of a quick and easy electronic documents transfer.

The hardware interface resembles paper sheets. They are flexible and one can release them from under the thumb just like when using a usual book. Every sheet is a bit longer than the one above so that the

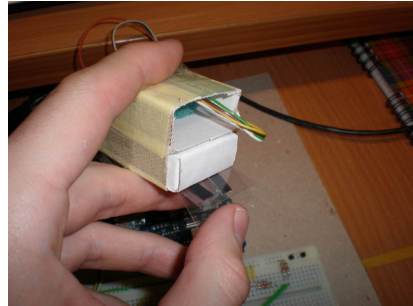


Flipping pages

user can accurately control the number of pages flipped. The user can turn pages one by one or quickly riffle through the document.

A popular microcontroller is responsible for interpreting signals coming from the interface. The prototype is built of cheap and generally available components.

The hardware is accompanied by the software. When I started my work on this project, I realized there is no document viewer that would satisfy my needs. They are generally slow, navigating takes a lot of time, pages load sluggishly and animated flipped pages seem to be a dream.



A closer look

This is why my implementation utilizes hardware accelerated graphics (*OpenGL*). This technology allows pages to turn flawlessly. Lately there has been a trend towards using that technology in operating systems' graphical environments (Intel Moblin).

Flipped pages are animated. Thanks to that feature the reader is constantly aware of the rate at which one is riffing through the book.

FUTURE DEVELOPMENT

The primary goal of the future development is to make the device appropriate for an assembly line.

Tests of other than optical sensors are scheduled as well.

I would like to make the device wireless so that it becomes simpler to operate and to allow the reader to use it in a same way as a cordless mouse. Probably a HID (*human interface device*) driver is going to be created.

The application will be extended with features that will bring it closer to a real paper book. Annotations, notes, corrections, bookmarks. A book will also “wear off” in a controllable manner.

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