ABSTRACT
We present 3 projects on interactive books. The Singing Book is an illustrated children book augmented by audio of songs, which are activated via web cam. The Interactive Aunt Pepper encourages to understand the content of these songs by requiring manipulation of the accompanying illustration by mouse, or by life hand gestures via Kinect. In the TERENCE EU project the goal is to provide an interactive environment to develop text comprehension of children, via offering stories to read and games used in-between reading tasks to test text comprehension success.

Author Keywords
Interactive book, interactive illustration, augmented book, multitouch, Kinect

ACM Classification Keywords
H5.2 User Interfaces

INTRODUCTION
In the recent years hand-held devices with touch screens – tablets, smart phones – are proliferating. One of the surprising experiences is the ease and curiosity with which kids and even babies handle these devices – urging manufacturers to market cheaper and kid-safe tablets [4]. Somewhat lagging behind is the content development for these devices. Particularly, we are interested in how the traditional, illustrated book genre can exploit the interactive capabilities of these devices. In our lab - being part a reputed art and design university, where creativity, aesthetic appeal, social sensitivity are “in the air”, - one of the research themes is the interactive book, in its broadest sense.

SINGING BOOK
A book was designed with characteristic illustration on the left and verse and music on the right, for 6 pieces from the well-known Aunt Pepper series for kids. We used IN2AR [2], an Adobe Flash AS3 Library that allows to detect images by using standard webcams, in poor lighting conditions and partial visibility too. Once an image is recognized, the corresponding song is played. The recognition and audio run on a server, allowing the usage anywhere via net connection and a web camera or the camera of a handheld device (phone, tab).

INTERACTIVE AUNT PEPPER
The illustrations designed for the Song by Page Turn project were turned into Flash animations, containing subtle idle animations (planets moving, eyes blinking) as well as actions to be performed by the child. The Flash image is visible while the corresponding song is played. The child has to perform the action according to what the song is about (e.g. cleaning the face of the Moon, giving apples to a small bird). In other cases, some location is to be found by moving the visible part of the image (rooftop with a garden). This Flash application, written in ActionScript 3 can be interacted with via the web, from a web browser.

We also experimented with mapping the Flash mouse events to gestures, to be recognized by a Kinect. We used the OpenNI library, mostly because of the Primesense NiTE
middleware [1]. For reasons of efficiency we don’t track the whole body, only one hand of the user. This application informs the Flash app about the motion of the hand and the recognized gestures through a local TCP connection.

In this version children could perform actions by hand gestures (sweep, push, circular motion). The type of gesture to be performed was hinted by a small animated icon, being part of the projected illustration.

We tested both versions with 22 children of age 9. They liked the idea, they were very motivated to interact with the illustrations, especially in person. We also found some issues to be improved:

- the free activities were not as motivating as the goal-oriented ones for the children,
- with some actions, the repetitive motion (both by mouse and by gesture) were too tiring,
- situations without visible feedback of the hand (in case of the gesture-based activation) were hard to understand and master.

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