

# MICROSOFT SURFACE- REAL WORLD MEETS SOFTWARE ENGINEERING

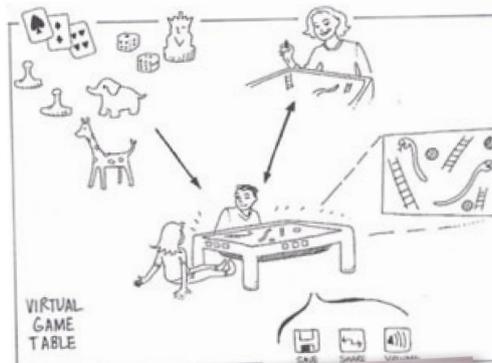
**Warren Rieutort-Louis**, third year at CUED and a Microsoft Student Partner in Cambridge, explores the power of software engineering and the design process through a new touch technology that hopes to revolutionise the way we interact with our environment...

Remember those hours you spent in your first and second years trying to find the missing semicolon in your confusing C++ program? Ever wondered how on earth this would be useful to you? After all, it's not *real* engineering, is it? Well for those that are still wondering consider for a moment what our lives would be without software. No computers, no mobile phones, no digital cameras... no *Facebook!*

Software engineering is perhaps one of the most rapidly changing of all engineering domains. Over the last year I have been fortunate to act as a Microsoft Student Partner at CUED, and I want to show you one of the many innovations that Microsoft is predicting will have a big impact on the way we interact with our surroundings: the Microsoft Surface.

The Surface is a great example of the amazing things that can be achieved when software and hardware work in tandem. Essentially Surface consists of a large touchscreen table, with technology such as multi-touch sensing built in and a powerful software layer. Originally conceived in 2001 as an interactive table project by Microsoft Hardware and Microsoft Research

(a branch of which we have here in Cambridge) Surface quickly developed as an ideal example of the design process of software/hardware projects. Based on initial specifications and requirements lists (remember IA!) it was initially envisaged as a gaming table, through which people would interact in a manner both fun and intuitive.



examples of conceptual designs and prototypes, clearly highlighting that you frequently don't get things right first time in engineering design, and the mechanism used by the team to evaluate concepts was not far from those studied in IA product design.

The surface technology, discussed opposite is incredibly versatile and can be applied to a wider range of form factors. Imagine stepping into a restaurant and ordering in a fun interactive manner, being able to put your camera on the table and it downloads the photos or being able to shop and getting a comparison of products simply by placing them on the table! The possibilities are limited only by your imagination!



But it was soon realised that this device could have much greater reach and quickly software developed to take advantage of numerous features of the Surface such as its ability to recognise objects placed on the table through the means on a 5 cm<sup>2</sup> 8-bit tag.

The team iterated through several (over 85) designs, many based on IKEA furniture! The pictures show

The use of touch as an input interface is a powerful one in that it is inherently natural to us. Naturally, Surface technology is in its infancy, and relies on the creativity of us engineers to develop it (how fun!). Don't count on getting yourself one of these just yet though... starting off at £5000 makes these expensive toys.... *but aren't they just so cool!* ■



## Beneath the Surface...

### 1- 30 inch touchscreen

- Acrylic Table Top
- Multiple users can use screen.
- Supports and recognizes various inputs from fingers to paint brushes!
- Has object recognition technology built in that allows surface to recognize objects with bar-code like tags.

### 3- Computer

- Surface is powered by a standard PC running a modified version of Windows Vista
- Core 2 Duo Processor
- 2Gb Ram
- Can connect to internet/download from devices / interact with objects using WiFi (802.11b), Bluetooth 2.0
- Will be able to recognize RFID (Radio-Frequency Identification) tags.



Microsoft  
**Surface™**

### 2- Sensing technology

- The sensing is performed using infrared (850nm) light.
- Objects placed on the surface reflect light to one of the several infrared cameras, which detect this input.
- Multiple inputs (multi-touch) are allowed thanks to these multiple cameras.

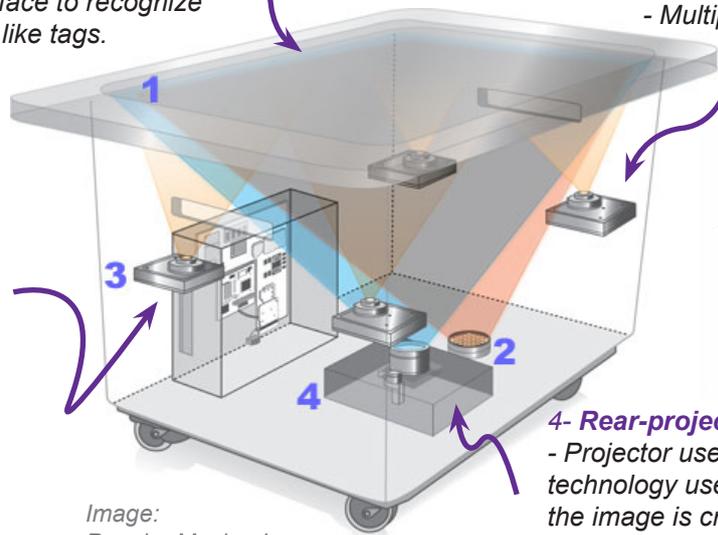
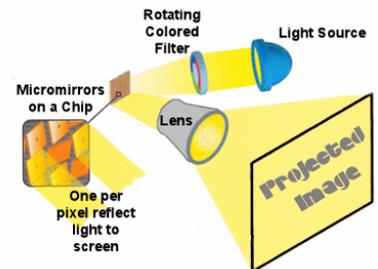


Image:  
Popular Mechanics



### 4- Rear-projection

- Projector uses Digital Light Processing (a technology used in many High-Def TVs) where the image is created by microscopic mirrors on the surface of a chip (see above)