

Magic Key



To open the doors of the World with a simple blinking

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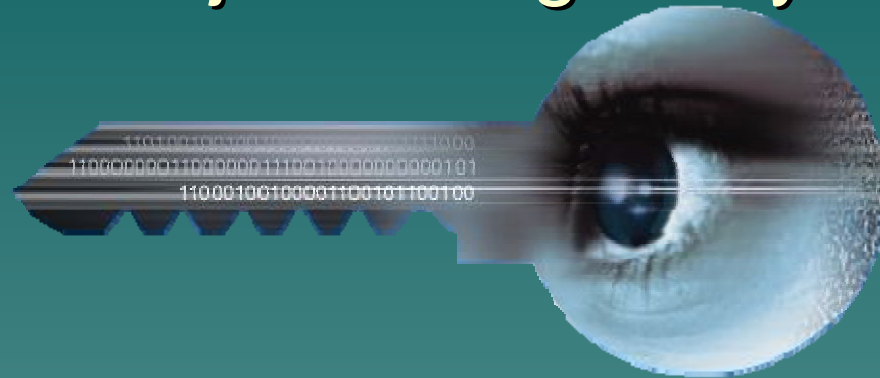
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Projecto Magic Key



www.magickey.ipg.pt

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Summary

- ◆ User and system requirements
- ◆ Technical issues
- ◆ Practical examples
- ◆ Conclusions



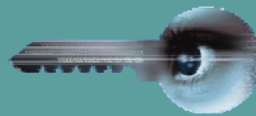
User requirements

- ◆ A simple system to be used by anyone who can control head movement
- ◆ A system that makes using the computer as similar as possible to its use by people who control their arm movements
- ◆ A system that allows the use of any computer application without having to configure it
- ◆ A system that is quickly learned and which needs no memorization
- ◆ A system that is physically independent from its user
- ◆ A low-cost system that does not require special equipment



System requirements

- ◆ Computer (Pentium 4 CPU at 3.0Ghz)
- ◆ Adapted Web Cam
- ◆ Near infrared light (840nm, 0.4W, 22°, 1.35mW/cm2 at 50cm)



Technical issues

- ◆ True real time mouse positioning by absolute head movement
- ◆ Resolution at pixel level
- ◆ High stability of mouse movement



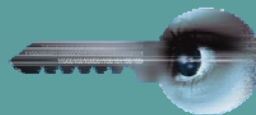
Technical issues

- ◆ All possible clicks by blinking the eyes
 - Simple click (left or right eye)
 - Double click
 - Auxiliary click (complementary eye)
 - Dragging
 - ◆ By closing the eye
 - ◆ By “pressed button”
- ◆ Very low level of involuntary clicks



Technical issues

- ◆ 30 images/second at 640*480
- ◆ About 10% of CPU time (including 7% for image acquisition on Pentium 4 at 3.0GHz)
- ◆ Very tolerant at different light conditions and user's anatomy
- ◆ Three ways of configuration
 - Auto (permanently active)
 - Semi-auto (by pressing space)
 - Manual



Practical examples

Internet

Paint

Task Manager



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WWW.MAGICKEY.IPG.PT

Conclusions

- ◆ Total mouse control with high cursor speed and precision
- ◆ Simple and absolute control of all types of clicks
- ◆ Making use of existing technology with ordinary low-cost equipment
- ◆ Very adaptable to the user's characteristics
- ◆ Tested under real conditions



