A low-cost self-expression system for paralyzed patients

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MOTIVATION

Need
• A low cost eye tracking system is especially in need for severely paralyzed patients as an essential communication apparatus.

Problem
• High cost of commercial eye tracking device.
• No self-expression system customized for paralyzed patients.

APPROACH

• Michael Chau, et al., ‘Real Time Eye Tracking and Blink Detection with USB Cameras’, ICVGIP, 2005
• Identify eye region using ‘Blink Detection’ algorithm

• Select iris using Camshift algorithm provided by OpenCV.

RESULTS

• Eye tracking system composed of a customized virtual keyboard and a memo pad

• Automated detection and tracking of iris
• Took 1 minute to write own name.

FUTURE WORK

• System accuracy enhancement and optimization.
• System validation by performance test with 5 different subjects.