Handy Touch-Typing

With recent advances in portable computing and in particular the design of pocket PCs (e.g. http://wearables.stanford.edu/main.html) and eye-glass displays (e.g. http://www.microopticalcorp.com/, http://www.machinebrain.com/), increasing effort has been spent in the design of portable input devices (and methods).

Microphones using voice recognition software have been used and developed not only since the advent of portable computing. However, for the latter purpose, privacy concerns for its use in settings such as airplanes or conference meetings are obvious. This is particularly true for the input of sensitive information.

Miniaturization of traditional keyboards using for example key reduction and the design of one-hand devices (chording devices) based on their own coding structure have recently hit the market, e.g. the "twiddler" (http://www.handykey.com/) or are on the drawing board (e.g. http://wearables.blu.org/hardwear.html). The latter also includes existing glove based systems (e.g. the "Chording-Glove" by Robert Rosenberg at University College of London, the "KeyGlove" by R. Paul McCarty at Rochester University or the glove-based system by Vaughan R. Pratt at Stanford University using the "Thumbcode" procedure (http://boole.stanford.edu/thumbcode/cat), where electrical contacts are placed on a single glove worn by its user, producing specific character input by closing pairs or multiple of these contacts according to a specified coding layout.

A researcher from the University of California at Irvine UCI has recently proposed a data-input method for a similar finger-mounted device (using for example two "gloves") which mimics the finger movement known from traditional touch-typing in order to provide alphabetical and numerical data input. The new device (i.e. system and method) guarantees a virtually zero learning curve for those well versed in touch-typing.

Production costs will be low since discrete signals are generated by the opening and closure of electric circuits totally analogous to existing keyboard technology. In addition, the ultra-portable device does not have the drawbacks of other systems [e.g. the "Virtual Keyboard" by Senseboard (http://www.senseboard.com/), the "Lightglove" (http://www.lightglove.com/) or the "Scurry" by Samsung (http://www.samsung.com/)], which also use touch-typing for alphabetic character input but which are based on continuous signal processing (which is error prone and involves the use of fairly expensive sensors) and which require the user to preserve a certain reference position with their hands in the course of touch-typing. Naturally, the new system can also be reduced for one-handed data-input using for example wrist-position detection to toggle between two character-set analogous to the method known from systems such as the halfkeyboard (http://www.halfkeyboard.com/).

As expressed by Dr. Mehring from UC Irvine, the new device tries to give glove-based or finger-mounted systems a new shot at the portable input device market by taking advantage of the existing skills of its potential users. As of today, user acceptance for newly developed ultra-portable input devices which can provide high rates of data-input required for ever more powerful pocket computers is limited by the requirement imposed on the user to learn new ways of data input.

"Proof of concept" for the method proposed by Dr. Mehring has been demonstrated with a first glove-based proto-type (see photograph). Less intrusive design concepts have already been developed and are currently pursued. One of these designs uses printed-circuit electrical wires on thin flexible spiral-shaped substrate strips winding around each finger of the hand and providing electrical contacts on thumbs and fingertips and/or alongside each finger to generate all the characters found on a traditional keyboard using traditional touch-typing skills (see photographs). Plans for commercialization and licensing are underway.
Advanced KITTY design

Spiral-shaped printed-circuit wires connecting to "watch-like" unit carrying wireless transmission electronics

Glove-based prototype (one hand shown only)