DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0032] FIG. **1** shows a simplified block diagram of the hardware components of a typical device **100** in which the System and Method for Continuous Stroke Word-Based Text Input is implemented. The device **100** includes a touch-screen **120** provides input to the CPU (processor) **110** notifying it of contact events when the screen is touched, typically mediated by a hardware controller that interprets the raw signals received from the touch-screen and communicates the information to the CPU **110** using a known communication protocol via an available data port. Similarly, the CPU **110** communicates with a hardware controller for a display **130** to draw on the display **130**. Optionally a speaker **140** is also coupled to the processor so that any appropriate auditory signals can be passed on to the user as guidance (predominantly for error signals). The processor **110** has access to a memory **150**, which may include a combination of temporary and/or permanent storage, and both read-only and writable memory (random access memory or RAM), read-only memory (ROM), writable non-volatile memory such as FLASH memory, hard drives, floppy disks, and so forth. The memory **150** includes program memory **160** that contains all programs and software such as an operating system **161**, a Continuous Stroke Word-Based Text Input software **162**, and any other application programs **163**. The memory **150** also includes data memory **170** that includes the word database(s) **171** required by the Continuous Stroke Word-Based Text Input software **162**, storage for maintaining a record of user options and preferences **172**, and any other data **173** required by any element of the device **100**.

[0033] In one aspect, the input path analysis component determines the sequence of first and second order differences (corresponding to rates of change) of the x- and y-coordinates of the sequence of points in the input path. The ratio of the x and y first order differences corresponds to the "slope" of the input path at each point, such that the second order difference corresponds to the rate of change in the slope. A second order difference hovering near zero corresponds to a segment of the input path that is a relatively straight line. A small, relatively constant second order difference indicates a constant rate of change in the slope corresponding to a segment of the input path that has a slight, constant curvature. A sharp peak or rapid change in the second order difference corresponds to a relatively sharp change in direction of the input path. In another aspect, since the magnitude of the first and second order differences is also a function of the frequency with which contact location data points are sampled and collected by the operating system as well as the speed at which the user is moving the point of contact, the first and second order differences at each point along the input path are calculated with respect to two points at a fixed distance preceding and following the given point along the input path. In another aspect, to simplify computational requirements, this fixed distance is approximated by a fixed sum of the absolute magnitude of the x- and y-first order differences.

[0034] In yet another aspect, when the system detects that the input path has crossed over itself in a loop (as in the entry of a small circle in the entry of a DoubleLetter gesture, as defined below), the magnitude of the fixed distance used is reduced to approximately the radius of the loop, and the magnitude of the second order difference calculated is scaled according to the ratio of the standard fixed distance to the reduced fixed distance used.

[0035] In another aspect, the input path analysis component identifies different types of inflection points in the input path. For example, PenDown, the location where the stylus first makes contact with the touch-screen, PenUp, the location where the stylus breaks contact with the touch-screen, AngleThreshold, a location where there is a significant change in the direction of the input path, and TAP, a location where the stylus is more or less immediately lifted after contacting the screen, corresponding to a case of a one-letter word or the selection of a single function key. In one embodiment, the AngleThreshold inflection point is identified at a location where the sum of the absolute magnitudes of the x and y second order differences reaches a local maximum, having exceeded a pre-determined minimum threshold.

[0036] In another aspect, an additional type of inflection point is defined which corresponds to a location where the stylus paused in the trajectory of the input path for more than a determined threshold time interval (a PauseThreshold inflection point). In another aspect, more than one type of PauseThreshold inflection point is defined based on two or more distinct threshold time intervals. In another aspect, an additional type of inflection point is defined which corresponds to an AngleThreshold inflection point where it is also determined that the stylus paused in the trajectory of the input path for more than a determined threshold time interval within a determined distance along the input path from the location determined for the AngleThreshold inflection point (a PauseAngle inflection point). In other aspects, the distance calculated between a key matched to an inflection point is adjusted according to various characteristics of the input path in the neighborhood of the matched point as well as the preceding and following keys of the word and the input path points to which these keys are matched.

[0037] In another aspect, an additional type of inflection point is defined which corresponds to a predetermined type of stylus movement, or gesture, that the user can execute to indicate entry of a double letter (DoubleLetter) to distinguish between the entry of the words such as "feel" and "fell," and to increase the likelihood of correct recognition of a word with a double letter when the input path is entered quickly (and less precisely). When a DoubleLetter inflection point type is included, a distinguishable movement is performed at or near the key associated with the letter "e" in the case of the word "feel," but at or near the key associated with the letter "l" in the case of the word "fell," enabling the system to distinguish between the input paths for the two words. In another aspect, the movement associated with a DoubleLetter inflection point type is a relatively small circular motion of the stylus at or near the location of the key associated with the letter to be doubled. The location of a DoubleLetter inflection point is defined as the center of the relatively small circular gesture traced by the user. In another aspect, each successive additional repetition of the movement associated with a DoubleLetter inflection point denotes an additional occurrence of the letter in the word being entered. For example, the word "AAA" would be entered by contacting the screen at or near the key associated with the letter "a," executing two small circles with the stylus, and lifting the stylus from the touch-screen.