

embodiment, the Promotion Algorithm increases the value of the frequency associated with the word selected by a relatively large increment, while decreasing the frequency value of those words passed over by a very small decrement. For a lexicon in which relative frequency information is indicated by the sequential order in which words appear in a list, promotions are made by moving the selected word upward by some fraction of its distance from the head of the list. The Promotion Algorithm is designed to tend to avoid moving the words most commonly used and the words very infrequently used very far from their original locations. In one preferred embodiment, this is achieved by altering the fraction of the remaining distance by which a selected word is promoted depending on its current relative position in the overall list. For example, words in the middle range of the list are promoted by the largest fraction with each selection. Words intermediate between where the selected word started and finished in the lexicon promotion are effectively demoted by a value of one. Conservation of the “word list mass” is maintained, so that the information regarding the relative frequency of the words in the list is maintained and updated without increasing the storage required for the list.

[0234] In accordance with another aspect of the invention, the Promotion Algorithm operates both to increase the frequency of selected words, and where appropriate, to decrease the frequency of words that are not selected. For example, in a lexicon in which relative frequency information is indicated by the sequential order in which words appear in a list, a selected word which appears at position IDX in the list is moved to position $(IDX/2)$. Correspondingly, words in the list at positions $(IDX/2)$ down through $(IDX+1)$ are moved down one position in the list. Words are demoted in the list when a sequence of interaction points is processed and a word selection list is generated based on the calculated matching metric values, and one or more words appear in the list prior to the word selected by the user. Words that appear higher in the selection list but are not selected may be presumed to be assigned an inappropriately high frequency, i.e. they appear too high in the list. Such a word that initially appears at position IDX is demoted by, for example, moving it to position $(IDX*2+1)$. Thus, the more frequent a word is considered to be, the less it is demoted in the sense that it is moved by a smaller number of steps.

[0235] In accordance with another aspect of the invention, the promotion and demotion processes may be triggered only in response to an action by the user, or may be performed differently depending on the user’s input. For example, words that appear higher in a selection list than the word intended by the user are demoted only when the user selects the intended word by clicking and dragging the intended word to the foremost location within the word selection list? using a stylus or mouse or equivalent interaction actions on the virtual keyboard.

[0236] Alternatively, the selected word that is manually dragged to a higher position in the selection list may be promoted by a larger than normal factor. For example, the promoted word is moved from position IDX to position $(IDX/3)$. Many such variations will be evident to one of ordinary skill in the art.

[0237] FIG. 4F shows a preferred embodiment for adjusting the prioritization of words when a word is picked from the word choice list. Decision block 4610 determines if the

selected word choice item is the exact-type word, that string of characters whose x/y locations happens to correspond exactly to the sequence of interaction points, which in a preferred embodiment is displayed in a distinct location in the word choice list, such as in FIG. 1B where the exact-type word 154 (“rwzt” in the example shown) is separated by a solid line from other words in the list. If the chosen word is not the exact-type word, such as items 157 or 160, at block 4620 the chosen word is promoted, as in the preferred embodiment shown in FIG. 4G, and at block 4630 each of the words that appeared in the word choice list ahead of the chosen word are explicitly demoted, as in the preferred embodiment shown in FIG. 4H, in contrast to the incidental demotion that may occurs to one or more words simply as a consequence of the promotion of another word.

[0238] If at block 4610, the chosen word is determined to be the exact-type word, decision block 4640 identifies if that word is a new word that is not yet included in the vocabulary modules. If not, then at block 4650 promotes the chosen word is promoted. If the chosen exact-type word is not yet included in the vocabulary modules, block 4660 identifies the appropriate word-list to which the word is to be added. Decision block 4665 identifies if space is available within the appropriate word-list, And if not, at block 4670 the last, least likely word in the appropriate word-list is deleted to make room for the word to be added. At block 4675 the new word is added as the least likely word in the appropriate word-list, then at block 4680 the newly added word is promoted without explicitly demoting the other words that appeared in the word choice list.

[0239] FIG. 4G shows a preferred embodiment of the word promotion performed in blocks 4620, 4650 and 4680. Block 4710 identifies the chosen word’s position within its word-list, and assigns idx that position value. Block 4720 defines new_idx as one half of the value of idx , specifying a position in the list halfway from the current position to the head of the list, i.e. the position of the word deemed to be most likely to be selected. Block 4730 demotes all words in positions between idx and new_idx by one position, filling the word’s old position at idx and making room for the word at new_idx . Block 4740 then promotes the chosen word by inserting it back into the list at position new_idx . Note that this preferred method of promotion essentially has the effect of decrementing by 1 the $idx_multiplier$ calculated for the word at block 4355.

[0240] FIG. 4H shows a preferred embodiment of explicit word demotion performed in block 4635. Block 4810 identifies the explicitly demoted words position within its word-list and assigns idx that position value. Block 4820 defines new_idx as double the value of idx plus one. Decision block 4830 compares the value of new_idx to the total number of words in the word-list. If new_idx is greater than the total number of words in the word-list, Block 4835 sets new_idx equal to the value of the number of words in the word-list, since a word can be demoted no further than the end of the list. Block 4840 promotes all words in positions between idx and new_idx by one position, filling the word’s old position at idx and making room for the word at new_idx . Block 4850 then demotes the chosen word by inserting it back into the list at position new_idx . Note that this preferred method of demotion essentially has the effect of incrementing by 1 the $idx_multiplier$ calculated for the word at block 4355.