[0206] There are two broad methods of doing this: either a pattern match to the nearest candidate among stored data or a geometrical method. The pattern match requires either a large data set or a neural network style approach, both of which are successful but computationally expensive. If the geometry of the object and sensor array are simple, then the geometrical method lends itself to implementation on a small microprocessor. In the case of an outstretched finger and an orthogonal rectangular array, the geometry is relatively straightforward. The geometrical method lends itself to being effective with little or no user calibration, so that effectively it is a self-calibrating method. Since the effective calibration operates for each press, it is effectively a dynamic self-calibration.

[0207] Take the existing graph as a representation of the effect on each wire at virtually every point across the grid. Now take n points of data from a vertical line chosen at random, the sample line **510** for example. The position determination and interpolation is performed in X & Y independently as follows.

[0208] 1. The most pressed column **302** is found using the existing deltaT method (explained in relation to FIGS. **20-22**). This places the touch at a position somewhere between positions **304** & **306**, i.e when the value on wire **302** is largest.

[0209] 2. The second most pressed column is then found by comparing the value on the wile adjacent in the most pressed column, i.e. the magnitude of the bell curves **501** & **503** at the intersection with sample line **510**. This will put the touch point somewhere to the left or right of line **505**. In this example the point must be to the left as **501** is greater than **503** at the intersection with the sample line **510**.

[0210] 3. The touch point is then known to be somewhere between the lines **504** and **505**. These are the crossing points of curves **501** & **502** and curves **501** & **503** respectively. We compute the average magnitude of curves **501** & **502**, giving curve **508**, and the average magnitude of curves **501** & **503**, giving curve **509**. These curves are particularly useful because between the lines **504** & **505** the value on curve **501** is greater than the average **508** and less than the average **509**, Also, at the line **514**, the curve **501** is equal to curve **508** and at the line **505** the curve **501** is equal to curve **509**.

[0211] 4. The proportion of curve **501** relative to the two average curves **508** & **509** is therefore some function of the distance between the two lines **504** & **505**. This function can be determined either experimentally, and then programmed into a look up table, or mathematically, and then applied to the raw data to compute the position, At a first pass, a linear relationship generates a reasonable interpolation of position with some improvement generated by using a quadratic function or a series of straight line segments approximating a quadratic function.

[0212] **FIGS. 26 and 27** show in plan and elevation a hand **604** with outstretched finger **605** on a touch screen **606** and the apparent positions calculated by two algorithms—geometric **602** and weighted mean **603**. With the palm and knuckles a long distance back from the screen, both algorithms give similar touch coordinates near to point **601**. When significant palm effect is introduced (the hand brought very close to the screen as the screen is touched), the geometric algorithm moves about 5%, i.e. to point **602**. The centre-of-mass algorithm gives a bigger offset moving to point **603** for the same degree of palm introduction. Thus, by calculating the difference between these two calculated positions **602** & **603**, an estimate of the true touch position **601** is obtained. Means effecting this calculation thus serve for palm rejection.

[0213] **FIG. 28** is a diagram of a single surface asymmetrical sensor arrangement ‘backgammon grid’. The single conductive surface represented by the rectangle is cut into a series of triangles by cut lines across the surface. Thus, the surface is cut into areas **621-628**. Position in X can be determined by considering sensor zones **621-622**, **623-624** etc as a single approximately rectangular zone and using interpolation as described before to determine position. Position in Y can be determined by comparing the effect between even numbered and odd numbered zones. Errors are introduced by the complex geometry of the grid and an iterative approach is required to find an accurate position on the grid.

[0214] **FIG. 29** is a drawing showing a general arrangement for laser etching the coating from electrically conductive glass **701** to form the column layer as described in relation to **FIG. 24** without introducing unwanted capacitive coupling. In the **FIG. 24** arrangement, the gaps in between lines were chemically etched to remove the entire material and provide holes for the rows to sense through. The preferred glasses for construction are not easily chemically etched and so a laser is used. A laser is unable to remove large areas, being fundamentally designed to cut lines. The gaps between sensors are first cut away with long lines **702**. Although this removes them from the general material of the front sensor it leaves long floating strips of material which tend to couple all the row sensors together. These rectangles are therefore further cut by making cross cuts **703**. Thus, although the rows capacitively couple to these small areas, they do not then couple to other rows, and crosstalk is kept to an acceptable level.

[0215] **FIG. 30** is the circuit diagram of an improved capacitance detection means more able to differentiate noise. A capacitive sensing plate **801** and buffer plate **802** are set to measure the capacitance of a finger. Noise sources **V1**, **V2** & **V3** impinge upon these plates erroneously triggering the detection means. A number of beneficial modifications have been made compared with the circuits disclosed in previous patents to limit the excursions of the circuit due to these noise sources. D1, D2 & **R3** form a clipping circuit which limits the voltage excursions on the buffer to one diode drop of the mean point. Thus the energy content of high voltage static spikes and monitor noise impinging upon the sensor or buffer are dramatically reduced, Resistors **R1** & **R3** provide a DC path through which static on the sensor plate **801** can be continuously discharged to ground 0V regardless of the state of the switch S1. In a scanning system, static charge building up on the sensor plate **801** which is able to overcome the bleed-off resistor **R1** is connected into the buffer from time to time via a voltage controller switch **S1** which is an integral part of the multiplexer **803** (MUX). Capacitors C1 & C2 provide a block to this charge, thus avoiding any disturbance of the DC operating point of the