recorded and for each pre-defined point at each predefined force level, the delta values between actual and measured coordinates are recorded.

[0114] Thus, in FIG. **15**, the different force levels are represented by the 3 dimensional grids at calibration points **170**, **171**, **172** and **173**—the compensation actually needs to be applied in a three dimensional grid (or matrix), where the dimensions are x-coordinates, y-coordinates and force levels. The more calibration points and calibration force levels, the better the precision and end result. However, memory and processing requirements are also increased.

[0115] The measured delta per calibration point per force level is applied as compensation. In addition, for calibration points that are between points, such as grid **175** and **176**, extrapolation is used to calculate these extended grids. The extrapolation typically uses the closest **4** calibration points, but can use more and can add additional weights, especially if the grid is divided into more areas, such as 9 calibration points and 9×9 areas (rather then 5×5 as shown in FIG. **15**).

[0116] The measured and the extrapolated compensation values per grid area and per force level are recoded in a compensation table as seen in FIG. **16** that may be accessed and applied by the touch screen control software as seen in FIG. **7** anytime a coordinate is calculated and provided to the overlaying operating system.

[0117] Note that for a touch that falls between two discrete force levels, the values may be interpolated between the closes layers, where the pressure p=n*(1−m)+(n+1)*m;

[0118] where; m is the normalized value representing the inversed distance to the closes matched layer.

[0119] In order to improve the statistical correctness and to reduce impact from unknown events, such as unfiltered background noise, measuring each point **3** or more times is recommended, but may not be required, especially if the system has a sufficient filtering of background noise and shielding from interference.

[0120] It should now be apparent that the above-described control software comprises an array of functional compensation modules including filtering, voltage conversion, sensor calibration, sensor reading linearization, auto calibration, positioning determination and finally end-user and mechanical calibration. The array of compensation modules can bring system accuracy up to an average positioning error below around or even below 1%, which is far better than the average positioning error of 25% to 50%. The increased positioning accuracy makes it possible to use FSRs as opposed to traditional piezoresistive based touch screen sensors.

[0121] Having now fully set forth the preferred embodiment and certain modifications of the concept underlying the present invention, various other embodiments as well as certain variations and modifications of the embodiments herein shown and described will obviously occur to those skilled in the art upon becoming familiar with said underlying concept. It is to be understood, therefore, that the invention may be practiced otherwise than as specifically set forth in the appended claims.

What is claimed is:

1. A software method for improving touch precision of a differential force-sensor touchscreen, comprising a software module for linearization and homogenization of sensor data.

2. The software method of claim **1**, wherein said differential force-sensor touchscreen comprises a plurality of FSR sensors.

3. The software method of claim **1**, wherein said differential force-sensor touchscreen comprises a plurality of piezo resistive sensors.

4. The software method of claim **1**, wherein said differential force-sensor touchscreen comprises a plurality of nano technology-based force sensor.

5. The software method of claim **1**, wherein said software method further comprises a software module for temperature compensation of sensor data.

6. The software method of claim **5**, wherein said software method further comprises a software module for auto calibration and preloading compensation of sensor data.

7. The software method of claim **6**, wherein said software method further comprises a software module for humidity compensation of sensor data.

8. The software method of claim **7**, wherein said software method further comprises a software module for voltage compensation of sensor data.

9. The software method of claim **8**, wherein said software method further comprises a software module for filtering of sensor data noise.

10. The software method of claim **9**, wherein said software method further comprises a software module for material calibration of said touchscreen.

11. The software method of claim **1**, wherein said software method further comprises one or more software modules for data filtering, voltage conversion, sensor calibration, sensor reading linearization, auto calibration, positioning determination and finally end-user and mechanical calibration.

12. A software method for improving touch precision of a differential force-sensor touchscreen, comprising a software module for compensation of sensor data.

13. The software method of claim **12**, wherein said differential force-sensor touchscreen comprises a plurality of FSR sensors.

14. The software method of claim **12**, wherein said differential force-sensor touchscreen comprises a plurality of piezo resistive sensors.

15. The software method of claim **12**, wherein said differential force-sensor touchscreen comprises a plurality of nano technology-based force sensor.

16. The software method of claim **12**, wherein said software module for compensation of sensor data further comprises a software module for linearization and homogenization of sensor data.

17. The software method of claim **16**, wherein said software module for linearization and homogenization of sensor calculates an absolute force applied on a sensor by the following function:

$$Y=A_n*X^n+A_{n-1}*X^{n-1}+\ldots+A_2*X^2+A_1*X^1+A_0$$

where

X is an output value of the sensor;

Y is a calculated value of force in mg;

n is a degree of polynomial function; and

An . . . A**0** are predetermined coefficients.

18. The software method of claim **12**, wherein said software module for compensation of sensor data further comprises a software module for temperature compensation of sensor data.

19. The software method of claim **18**, wherein said temperature compensation module compensates said sensor data based on prior sensor readings.