

tor touches and the magnitude of those touches at distinct points across the touch sensitive surface of the touch screen.

**15.** The display arrangement as recited in claim 14 wherein the multipoint sensing arrangement provides a plurality of transparent capacitive sensing nodes that work independent of one another and that represent different points on the touch screen.

**16.** The display arrangement as recited in claim 15 wherein the capacitive sensing nodes are formed with a transparent conductive medium.

**17.** The display arrangement as recited in claim 16 wherein the transparent conductive medium corresponds to indium tin oxide (ITO).

**18.** The display arrangement as recited in claim 16 wherein the capacitive sensing nodes are based on self capacitance.

**19.** The display arrangement as recited in claim 18 wherein the transparent conductive medium is patterned into electrically isolated electrodes and traces, each electrode representing a different coordinate in the plane of the touch screen, and the traces connecting the electrodes to a capacitive sensing circuit.

**20.** The display arrangement as recited in claim 16 wherein the capacitive sensing nodes are based on mutual capacitance.

**21.** The display arrangement as recited in claim 18 wherein the transparent conductive medium is patterned into a group of spatially separated lines formed on two different layers, driving lines are formed on a first layer and sensing lines are formed on a second layer, the sensing lines being configured to traverse across the driving lines in order to form a capacitive sensing node, the driving lines being connected to a voltage source and the sensing lines being connected to a capacitive sensing circuit, the voltage source driving a current through one driving line at a time and because of capacitive coupling, the current is carried through to the sensing lines at each of the capacitive sensing nodes.

**22.** The display arrangement as recited in claim 16 wherein the capacitive sensing nodes are coupled to a capacitive sensing circuit, and wherein the capacitive sensing circuit monitors changes in capacitance that occurs at each of the capacitive sensing nodes, the position where changes occur and the magnitude of those changes being used to help recognize the multiple touch events.

**23.** The display arrangement as recited in claim 22 wherein the capacitive sensing circuit comprises:

- a multiplexer that receives signals from each of the capacitive sensing nodes at the same time, stores all the signals and sequentially releases the signals one at a time through an output channel;

- an analog to digital converter operatively coupled to the MUX through the output channel, the analog to digital converter being configured to convert the incoming analog signals into outgoing digital signals;

- a digital signal processor operatively coupled to the analog to digital converter, the DSP filtering noise events from the raw data, calculating the touch boundaries for each touch that occurs on the touch screen at the same time and thereafter determining the coordinates for each touch.

**24.** The display arrangement as recited in claim 13 wherein the touch panel comprises:

- a glass member disposed over the screen of the display;

- a transparent conductive layer disposed over the glass member, the conductive layer including a pixilated array of electrically isolated electrodes;

- a transparent cover sheet disposed over the electrode layer; and

- one or more sensor integrated circuits operatively coupled to the electrodes.

**25.** The display arrangement as recited in claim 13 wherein the touch panel comprises:

- a first glass member disposed over the screen of the display;

- a first transparent conductive layer disposed over the first glass member, the first transparent conductive layer comprising a plurality of spaced apart parallel lines having the same pitch and linewidths;

- a second glass member disposed over the first transparent conductive layer;

- a second transparent conductive layer disposed over the second glass member, the second transparent conductive layer comprising a plurality of spaced apart parallel lines having the same pitch and linewidths, the parallel lines of the second transparent conductive layer being substantially perpendicular to the parallel lines of the first transparent conductive layer;

- a third glass member disposed over the second transparent conductive layer; and

- one or more sensor integrated circuits operatively coupled to the lines.

**26.** The display arrangement as recited in claim 25 further including dummy features disposed in the space between the parallel lines, the dummy features optically improving the visual appearance of the touch screen by more closely matching the optical index of the lines.

**27.** A computer readable medium including at least computer code executable by a computer, the computer code comprising:

- receiving multiple touches on the surface of a transparent touch screen at the same time;

- separately recognizing each of the multiple touches; and
- reporting touch data based on the recognized multiple touches.

**28.** A computer system comprising:

- a processor configured to execute instructions and to carry out operations associated with the computer system;

- a display device that is operatively coupled to the processor;

- a touch screen that is operatively coupled to the processor, the touch screen being a substantially transparent panel that is positioned in front of the display, the touch screen being configured to track multiple objects, which rest on, tap on or move across the touch screen at the same time, the touch screen including a capacitive sensing device that is divided into several independent and spatially distinct sensing points that are positioned throughout the plane of the touch screen, each sensing point being capable of generating a signal