

Touch Screen technology



Touch Screen

- A **touchscreen** is a display which can detect the presence and location of a touch within the display area.



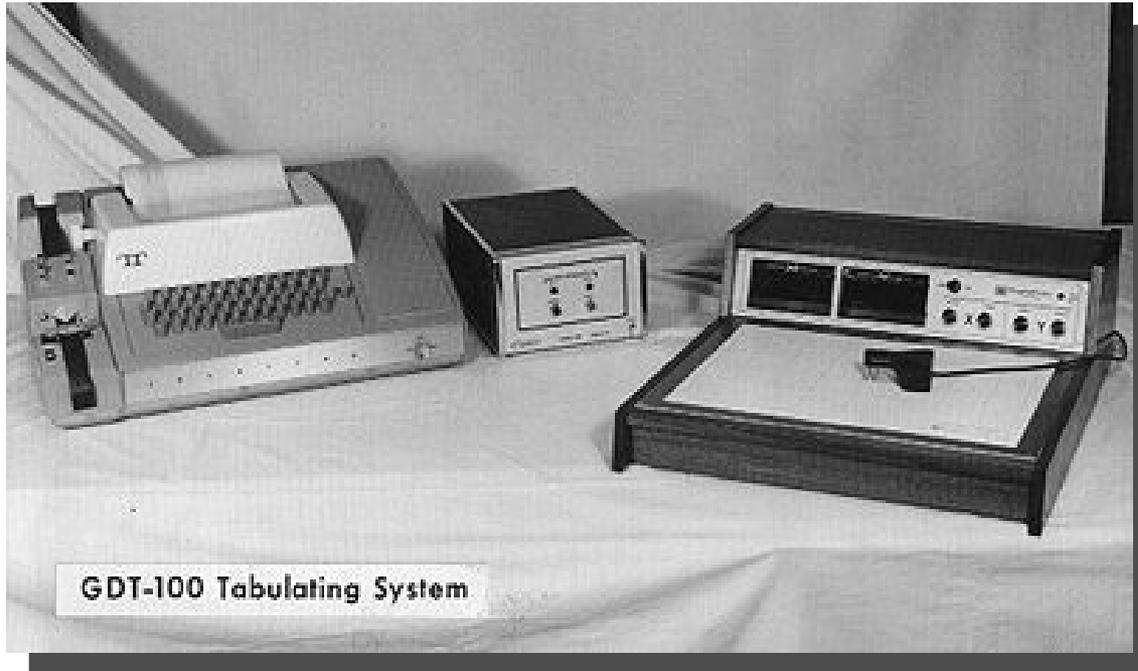
- The term generally refers to touch or contact to the display of the device by a finger or hand.



Ex: Touch Screen monitor

History

- In 1971, the first "touch sensor" was developed by Doctor Sam Hurst (founder of Elographics).
- This sensor called the "Elograph" .
- The "Elograph" was not transparent like modern touch screens; however, it was a significant milestone in touch screen technology.
- On February 24, 1994, the company officially changed its name from Elographics to **Elo Touch Systems**.



Elograph—Electronic Graphing Device

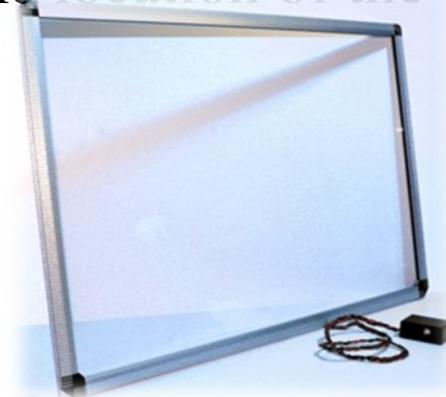
Touch Screen Technology

- A basic touchscreen has three main components:
 - Touch sensor
 - Controller
 - Software driver.



1.Touch Sensor

- A touch screen sensor is a clear glass panel with a touch responsive surface.
- The sensor generally has an electrical current or signal going through it and touching the screen causes a voltage or signal change.
- This voltage change is used to determine the location of the touch to the screen.



2.Controller

- The controller is a small PC card that connects between the touch sensor and the PC.
- It takes information from the touch sensor and translates it into information that PC can understand.



3. Software Driver

- The driver is a software update for the PC system that allows the touchscreen and computer to work together.
- It tells the computer's operating system how to interpret the touch event information that is sent from the controller.

Types of Technologies

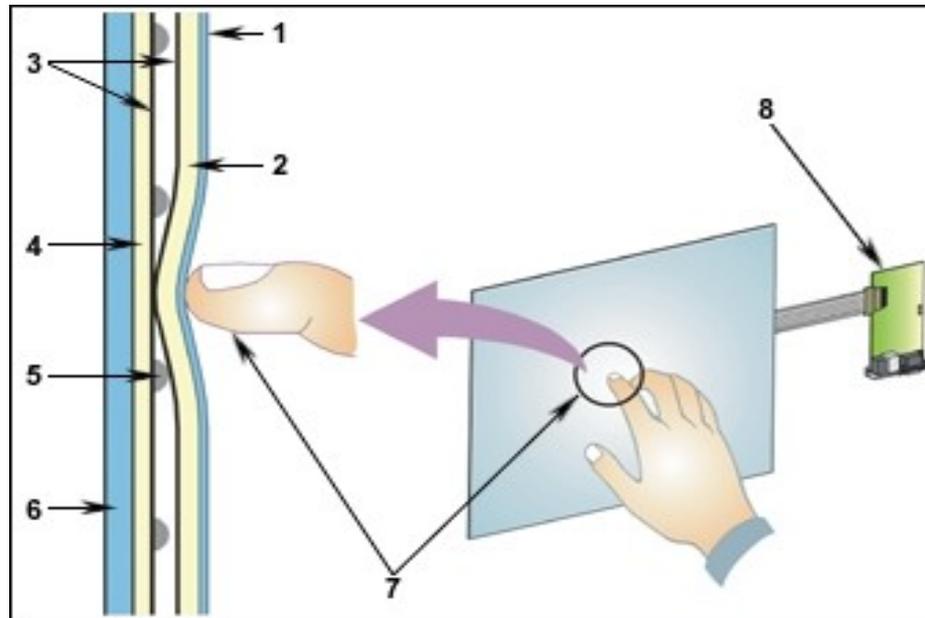
- There are three basic systems that are used to recognize a person's touch:
 - Resistive
 - Capacitive
 - Surface acoustic wave

Resistive Touch Screen technology

- The **resistive system** consists of a normal glass panel that is covered with a conductive and a resistive **metallic** layer.
- These two layers are held apart by spacers.
- An electrical current runs through the two layers while the monitor is operational.

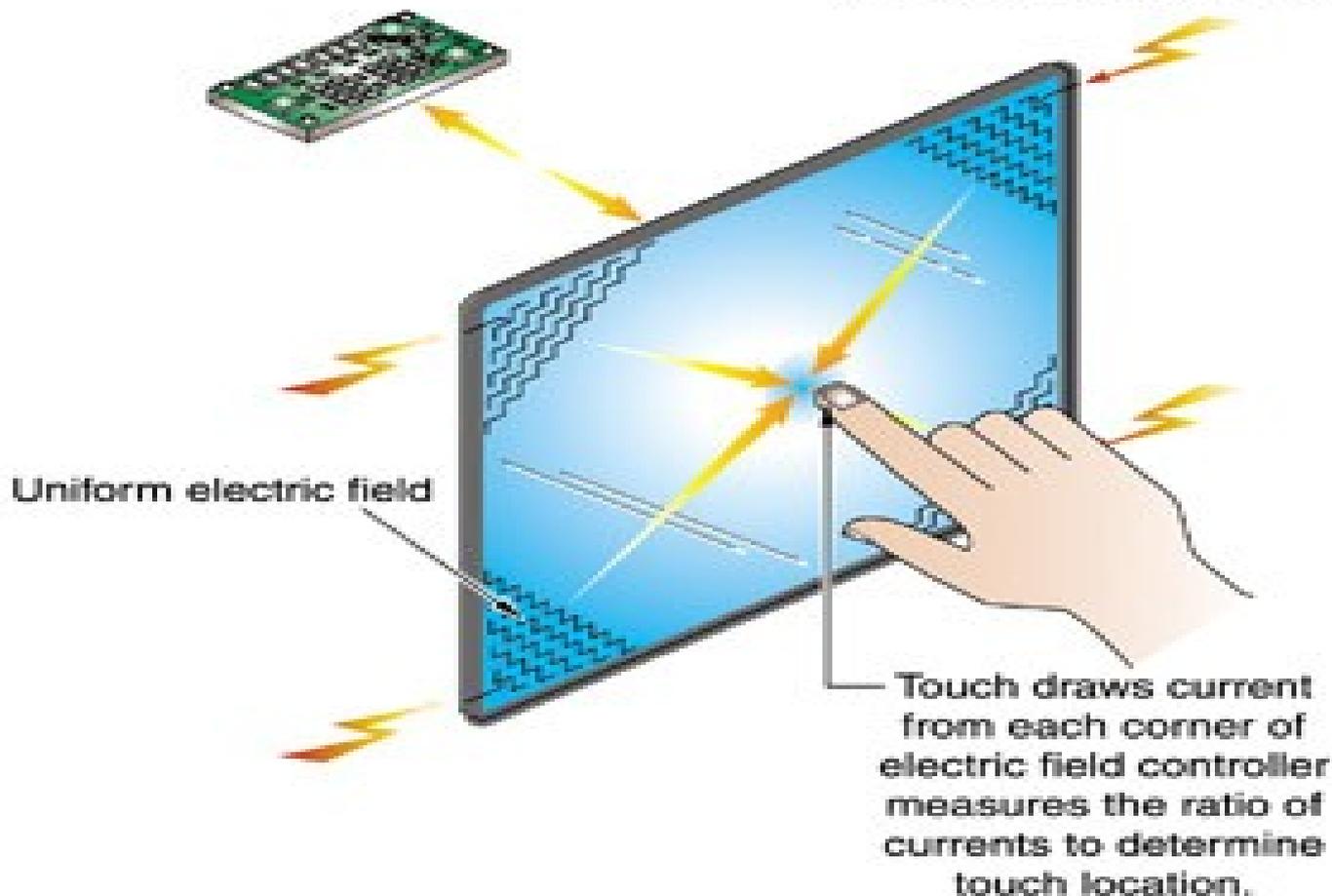
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- The change in the electrical field is noted and the coordinates of the point of contact are calculated by the computer.
- Once the coordinates are known, a special driver translates the touch into something that the **Operating System**.

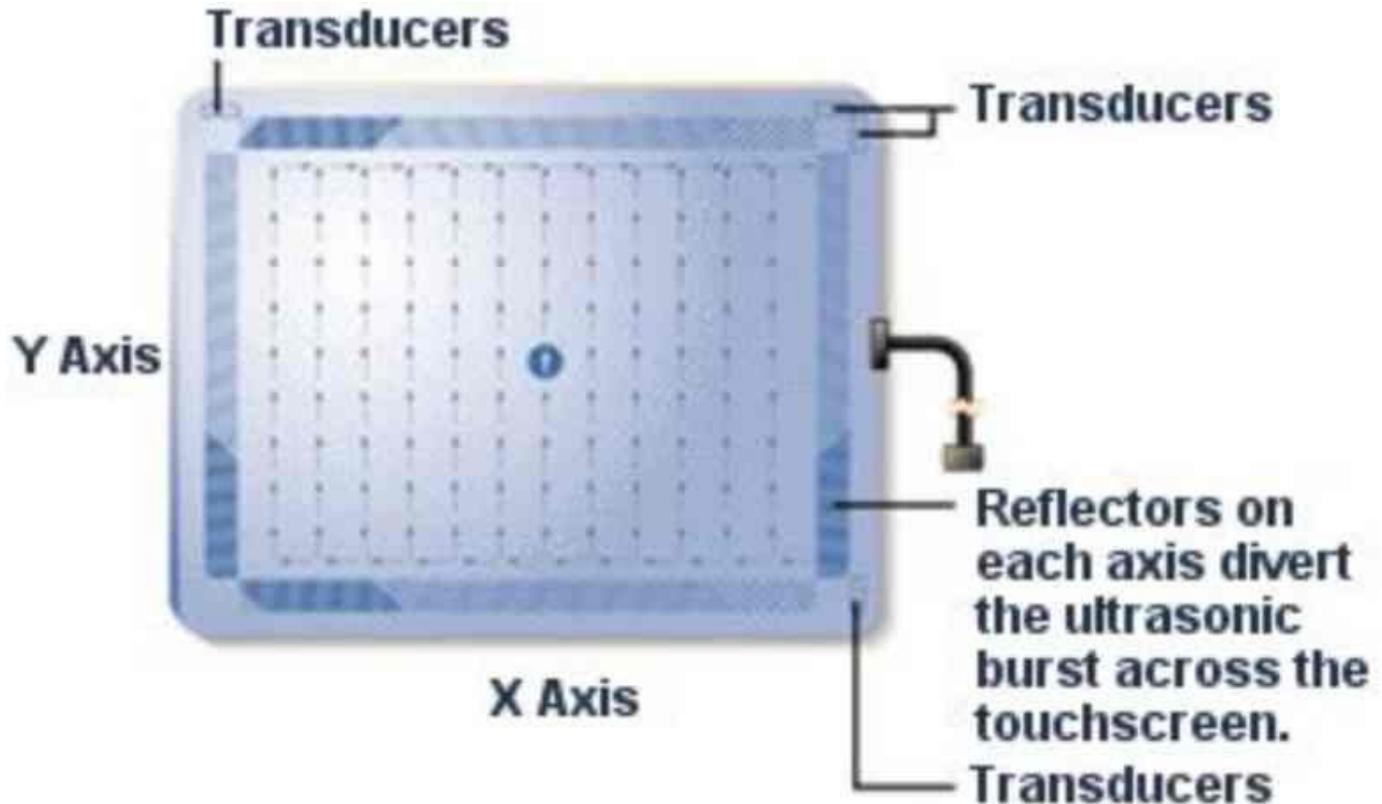


Capacitive Touch Screen Technology

Minute amount of voltage applied to all corners of touch screen



Surface acoustic wave Touch Screen Technology

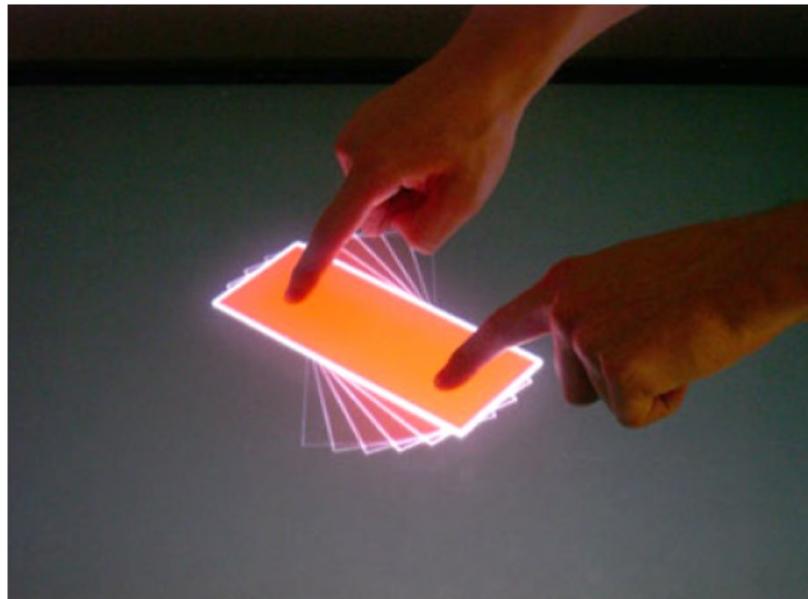


Comparing Touch Screen Technologies

- A resistive system registers a touch as long as the two layers make contact, which means that it doesn't matter if you touch it with your finger or a rubber ball.
- A capacitive system, on the other hand, must have a conductive input, usually your finger, in order to register a touch.
- The surface acoustic wave system works much like the resistive system, allowing a touch with almost any object -- except hard and small objects like a pen tip.

Building Touch Screens

- The key goals are to recognize one or more fingers touching a display, to interpret the command that this represents, and to communicate the command to the appropriate application.



The Latest in Touch-Screen Technology

NextWindow Optical Touch Screens

- NextWindow is an international leader in the development of optical multi-touch technology and the manufacture of optical multi-touch screens, overlays and OEM touch components.



Multi-Touch

- **Multi-touch** denotes a set of interaction techniques which allow computer users to control graphical applications with several fingers.
- Multi-touch consists of a touch screen or touchpad, as well as software that recognizes multiple simultaneous touch points.



What's Next for Computer Interfaces?

- Touch tricks for small and large displays could be the next big thing.

- **Tiny touch:**

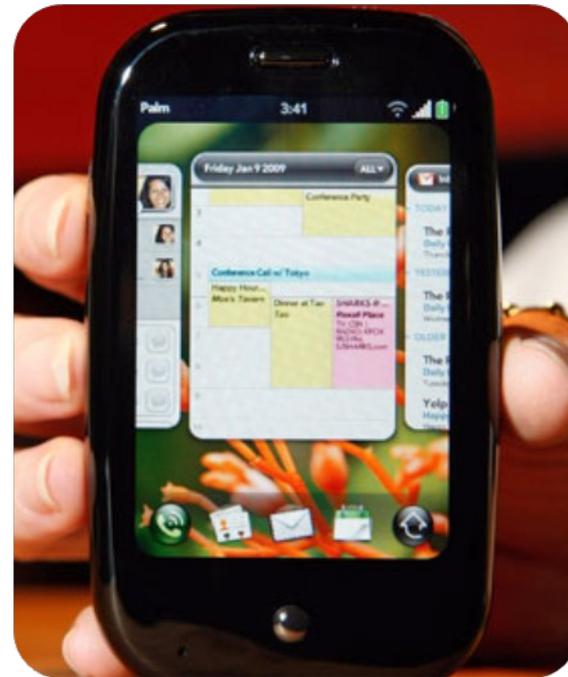
A device called nanoTouch has a touch-sensitive back to make it easier to view the front-side display. Here, a credit-card-size gadget shows an image of a person's finger on the back to help him move a cursor around the screen.



Touch-Screen Technologies

Palm Pre

- The struggling smart phone vendor is betting the Pre will help lead it back to glory.
- Like the iPhone, Pre's interface can be controlled through gestures made on the gizmo's touch-sensitive screen.



Windows 7

- The next version of Windows, Windows 7, will boast support for touch-screen interfaces.



iPhone

- Apple's iPhone kicked off the latest touch-screen fad.



Microsoft Surface

- Microsoft Surface was the star of the Consumer Electronics Show in 2008.



ATMs

- Touch screens have become common on ATMs and kiosk machines.



Samsung P3

- Unlike the iPod or iPhone, however, Samsung uses haptic feedback to give a user a little reassuring vibration whenever a menu item is selected.



LG's Watch Phone

- LG's Touch Watch Phone with touch-screen interface .



Coke machines

- Samsung's interactive uVend machine has a touch screen display to let users pick out a refreshing beverage.



What Are Touchscreens Used For?

- Public Information Displays
- Retail and Restaurant Systems
- Customer Self-Service
- Control and Automation Systems
- Computer Based Training
- And many more uses...

Pros and Cons of Touchscreens

Touchscreen Pros

- **Direct**
- **Fast**
- **Finger** is usable, any **pen** is usable (usually no cable needed).
- **No keyboard** necessary for applications that need menu selections only -> saves desk space
- **Suited to:** novices, applications for information retrieval, high-use environments.

Touchscreen Cons

- Low precision (finger)
- Sitting/Standing
- Dirt
- Screen coverage
- Fatigue



Thank You

