Skinput the Human Body as Touch Screen

M. Monisha
Dept of ECE-PITS

R. Preethi
Dept of ECE-PITS

N. Rithi Roshini
Dept of ECE-PITS

A. Sujatha Priyadharshini
Assistant Professor
Dept of ECE-PITS

***Abstract:*-Skin put, a technology that appropriates the human body for acoustic transmission, allowing the skin to be used as an input surface. In particular, we resolve the location of finger tap on the arm and hand by analyzing mechanical vibrations that propagate through the body. It is a new skin-based interface that allows and hands as touch screens by sensing different ultra low-frequency sounds that are generated when knocking various parts of skin.**

INTRODUCTION:

Skin put is an input technology that uses bio-acoustic sensing to localize finger tap on the skin. When augmented with a pico-projector, the device can provide a direct manipulation, graphical user interface on the body. It uses the sensors to determine where the user taps on their skin. Our skin produces natural and distinct mechanical vibrations when tapped at different places. Skin put allows the user to simply tap their skin in order to control audio devices, play games, make phone calls. It uses the sensors to determine where the user taps on their skin.

WHAT IS SKINPUT?

The term skin put is the combination of the words skin and input that implies the functionality of the technology-input through skin. The flexible nature of skin affords not only touching, but also pulling, shearing, squeezing, and twisting. Skin is capable of sensing various levels of contact force, which enables pressing. Touch can be performed with the fingernails, resulting in scratching, or the full hand can enclose another body part resulting in grabbing. Skin put technology was developed by Chris Harriso. Skin put turns the body into a touch screen surface.

PRINCIPLE OF SKINPUT:

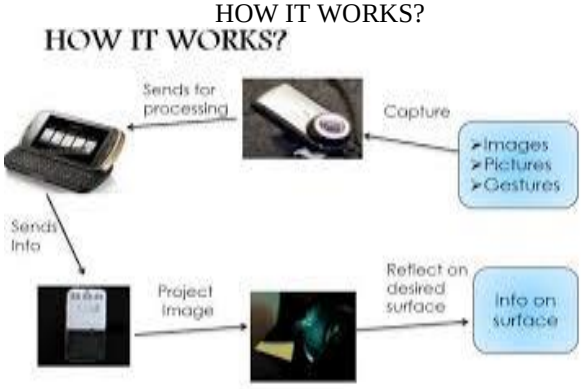
The principle on which this technology works is bio-acoustic. Whenever there is a finger taps on the skin, the impact creates acoustic signals, which can be captured by a bio-acoustic sensing device. Some amount of energy is lost to the external environment in the form of sound waves. Apart of the rest energy travels along the surface of the skin and the rest is transmitted inward till it's get reflected from the bone. Depending on the type of surface on which the disturbance is created, the amplitude of the wave varies. For example, on a soft surface o f forearm the amplitude is larger as compared to the surface of the elbow where the amplitude is smaller. It listens to vibrations in your body.

Skinput also responds to the various hand gestures. In skinput technology the arm is an instrument.

TECHNOLOGY USED:

*Bio-acoustic
*Pico-projector
*Bluetooth

HOW IT WORKS?



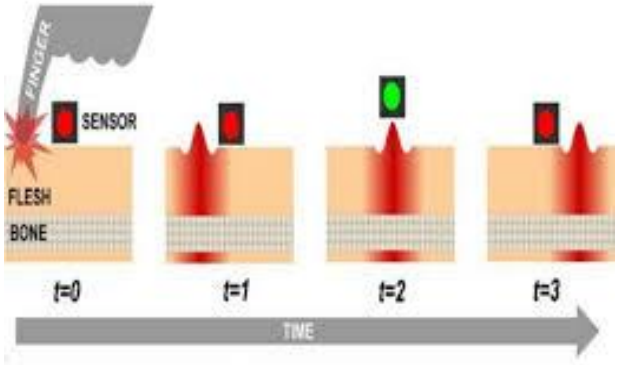
Skin put uses acoustic information, to capture this information a wearable armband that is easily removable. The Skinput sensor senses, analyze, and classify bio-acoustic signals. The working is based on acoustic signals through density of tissues. Tap on the arm translates through sensors into an instruction on a menu. The graphic display appears on your arm or hand, wherever the display is set up to be located, and from then on it's like using a cell phone. Arm is better, because the graphic display on your arm is about 200 times bigger. You can use Skinput to control devices you carry, like a dashboard setup. So in theory you can control your phone, your iPOD, etc, with one tap on your arm. It really does look impressive.

WHAT IS BIO-ACOUSTIC?

When a finger taps the skin, several distinct forms of acoustic energy are produced. Some energy is radiated into the air as sound waves; this energy is not captured by the Skinput system. Among the acoustic energy transmitted through the arm, the most readily visible are transverse waves, created by the displacement of the skin from a finger impact. In general tapping on soft regions of the arm creates higher amplitude transverse waves than tapping on boney areas (e.g., wrist, palm, fingers), which have negligible compliance. In addition to the energy that propagates on the surface of the arm, some energy is

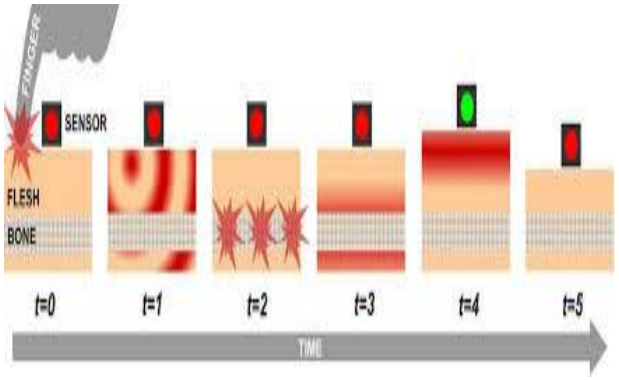
transmitted inward, toward the skeleton. Bio-acoustic is a study of sound waves inside living body. When a finger taps the skin, several distinct forms of acoustic energy are produced. Vibration creates longitudinal waves. Conduction transverse waves moving directly along the arm surface. And longitudinal waves moving into and out of the bone through soft tissues because these mechanisms carry energy at different frequencies and over different distances.

TRANSVERSE WAVE PROPAGATION:



Finger impacts displace the skin,creating transverse waves. The sensor is activated as the wave passes underneath it.

LONGITUDINAL WAVE PROPAGATION:



Finger impacts create longitudinal waves that cause internal skeletal structures to vibrate.

WHAT IS PICO-PROJECTOR?

A pico projector is a small hardware device designed to project content from a smart phone, camera, tablet, notebook or memory device onto a wall or other flat surface. Pico projectors are also known as pocket, handheld or mobile projectors and they take a number of formats that work in various way.

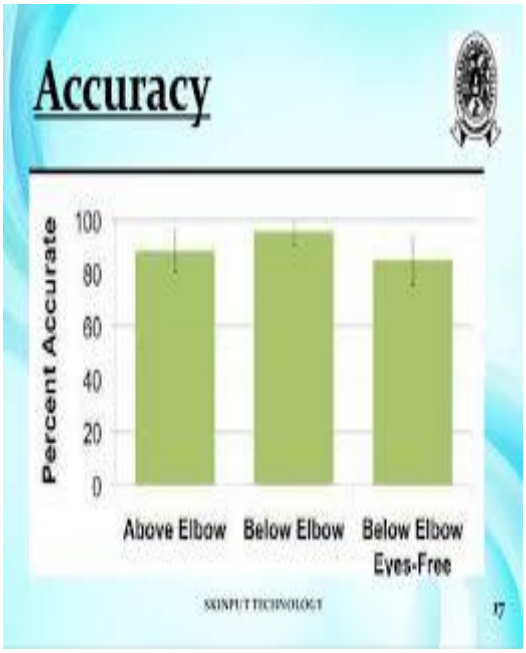
It is also known as pocket projector or mobile projector. The system comprises three main parts:

- The Laser light source
- The Combiner optics
- The Scanning mirror

ARMBAND:

Inside the Skinput armband is a pair of sensor arrays, each consisting of five sensors. When the armband is wrapped around your arm, one array sits on top of your arm and the other below it, giving the sensors the widest range of useful data.

PERCENTAGE ACCURACY:



ADVANTAGES:

- ✓ Easy to work.
- ✓ No worry about keypad.
- ✓ No interaction with the gadget.
- ✓ Can be used without Visual Contact
- ✓ Larger buttons to reduce the risk of pressing the wrong buttons.
- ✓ Through the use of a sense called pro prioception. After user learns where the locations are on the skin.
- ✓ *They will no longer to look down to

DISADVANTAGES:

*The easy accessibility will cause people to be more socially distracted.
* This technology only works on direct skin exposure.
* We cannot use full sleeves shirt when we are using this technology.
*The arm band is currently bulky.
* The visibility of the projection of the buttons on the skin can be reduced if the user has a tattoo located on their arm.
*If the user has more than a 30% BMI, accuracy is reduced to 80%.

APPLICATIONS:

As the devices gets smaller, so does the area to control them, such as buttons and touch screens. The search for an external surface focused on the one thing every persons always carries around with them, their skin. With the use of the sensors, one can control an players.

FUTURE SCOPE:

*Making banking system.
*ATM transactions using NYMI will resolve many security issues.
*Google will very soon going to release this technology in form of wearable password ring.
*Research is carried out for smaller wrist watch sized sensor armband.

CONCLUSION:

In this paper, we have presented our approach to appropriating the human body as an input surface. It described a novel, wearable bio-acoustic sensing array built into an armband in order to detect and localize finger taps on the forearm and hand.The system performs very well even when the body is in motion. The Skinput Technology works that are: Bioacoustic sensing, Pico-projector, Bluetooth. This as the input devices.

REFERENCES:

[1] Chris Harrison, Desney Tan, Dan Morris “Skinput: Appropriating the Body as an Input Surface” CHI 2010, April 10–15, 2010, Atlanta, Georgia, USA
[2] Shaikh Abdur Rehman Mohammed Sadique, Pragnesh N Shah “Skinput: Advance Input Technology” International Journal of Computational Engineering Research (IJCER) ISSN (e): 2250 – 3005 || Vol, 05 || Issue,02 || February – 2015 ||
[3] R.Lawanya, * Mrs.G.Sangeetha Lakshmi “Bio-Acoustic Sensing Of Skinput Technology” International Journal Of Scientific & Engineering Research, Volume 6, Issue 7, July-2015 2080 ISSN 2229-5518 technology has a great future scope as it uses our body as the input deviceselectronic device simply by tapping their skin in predestinated
[4] Seminar report available at http://dspace.cusat.ac.in/jspui/handle/123456789/2220
[5] Data electronically available at https://en.wikipedia.org/wiki/Skinput
[6] Skinput: Turn Your Body Into A Touching Interface. ARTICLE AVAIALBLE Athttps://Volumeoftech.Wordpress.Com
[7] Skinput: Appropriating the Body as an Input Surface Avaialble at https://www.microsoft.com
[8] Chris Harrison , Desney Tan, Dan Morris Skinput: appropriating the skin as an interactive canvas available at ACM Digital Library http://dl.acm.org/results. cfm?query=skinput&Go.x=0&Go.y=0 aces.