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Blue Brain

INTRODUCTION

Human brain, the most valuable creation of God. The man is called intelligent because of the brain .Today we are developed because we can think, that other animals can not do .But we loss the knowledge of a brain when the body is destroyed after the death of man. That knowledge might have been used for the development of the human society. What happen if we create a brain and up load the contents of natural brain into it.

“Blue brain” –The name of the world’s first virtual brain. That means a machine that can function as human brain. Today scientists are in research to create an artificial brain that can think, response, take decision, and keep anything in memory. The main aim is to upload human brain into machine. So that man can think, take decision without any effort.

After the death of the body, the virtual brain will act as the man .So, even after the death of a person we will not loose the knowledge, intelligence, personalities, feelings and memories of that man that can be used for the development of the human society. No one has ever understood the complexity of human brain.

It is complex than any circuitry in the world. So, question may arise “Is it really possible to create a human brain?” The answer is “Yes”. Because what ever man has created today always he has followed the nature. When man does not have a device called computer, it was a big question for all .But today it is possible due to the technology. Technology is growing faster than every thing. IBM is now in research to create a virtual brain. It is called “Blue brain “.If possible, this would be the first virtual brain of the world.

What is Blue brain?

The IBM is now developing a virtual brain known as the Blue brain. It would be the world’s first virtual brain. With in 30 years, we will be able to scan ourselves into the computers. Is this the beginning of eternal life?

What is Virtual Brain?

We can say Virtual brain is an artificial brain, which does not actually the natural brain, but can act as the brain .It can think like brain, take decisions based on the past experience, and response as the natural brain can. It is possible by using a super computer, with a huge amount of storage capacity, processing power and an interface between the human brain and this artificial one .Through this interface the data stored in the natural brain can be up loaded into the computer .So the brain and the knowledge, intelligence of anyone can be kept and used for ever, even after the death of the person.

Why we need virtual brain?

Today we are developed because of our intelligence. Intelligence is the inborn quality that can not be created .Some people have this quality ,so that they can think up to such an extent where other can not reach .Human society is always need of such intelligence and such an intelligent brain to have with. But the intelligence is lost along with the body after the death. The virtual brain is a solution to it. The brain and intelligence will alive even after the death.

We often face difficulties in remembering things such as people's names, their birthdays, and the spellings of words, proper grammar, important dates, history facts, and etcetera. In the busy life every one want to be relaxed .Can not we use any machine to assist for all these?

Virtual brain may be the solution to it. What if we upload ourselves into computer, we were simply aware of a computer, or maybe, what if we lived in a computer as a program?

How it is possible?

First, it is helpful to describe the basic manners in which a person may be uploaded into a computer. Raymond Kurzweil recently provided an interesting paper on this topic. In it, he describes both invasive and noninvasive techniques. The most promising is the use of very small robots, or nanobots. These robots will be small enough to travel throughout our circulatory

systems. Traveling into the spine and brain, they will be able to monitor the activity and structure of our central nervous system. They will be able to provide an interface with computers that is as close as our mind can be while we still reside in our biological form. Nanobots could also carefully scan the structure of our brain, providing a complete readout of the connections between each neuron. They would also record the current state of the brain. This information, when entered into a computer, could then continue to function as us.

All that is required is a computer with large enough storage space and processing power. Is the pattern and state of neuron connections in our brain truly all that makes up our conscious selves? Many people believe firmly those we posses a soul, while some very technical people believe that quantum forces contribute to our awareness. But we have to now think technically. Note, however, that we need not know how the brain actually functions, to transfer it to a computer.

We need only know the media and contents. The actual mystery of how we achieved consciousness in the first place, or how we maintain it, is a separate discussion.

Really this concept appears to be very difficult and complex to us. For this we have to first know how the human brain actually works.

-: BRAIN SIMULATION:-

Now the question is how to implement this entire natural thing by using artificial things.Here is a comparative discussion.

Natural Brain	Simulated Brain
1. INPUT In the nervous system in our body the neurons are responsible for the message passing. The body receives the input by the sensory cells. These sensory cells produces electric impulses which are received by the neurons .The neurons transfer these electric impulses to the brain.	**INPUT** In a similar way the artificial nervous system can be created. The scientist has already created artificial neurons by replacing them with the silicon chip. It has also been tested that these neurons can receive the input from the sensory cells .So, the electric impulses from the sensory cells can be received through these artificial neurons and send to a super computer for the interpretation.
2. INTERPRETATION The electric impulses received by the brain from the neurons are interpreted in the brain .The interpretation in the brain is accomplished by the means of certain states of many many neurons.	**INTERPRETATION** The interpretation of the electric impulses received by the artificial neuron can be done by means of a set of register .The different values in these register will represent different states of the brain.
3. OUTPUT Based on the states of the neurons the brain sends the electric impulses representing the responses which are further received by the sensory cell of our body to respond. The sensory cells of which part of our body is going to receive that, it depends upon the state o f the neurons in the brain at that time.	**OUTPUT** Similarly based on the states of the register the output signal can be given to the artificial neurons in the body which will be received by the sensory cell.
4. MEMORY. There are certain neurons in our brain which represent certain states permanently. When required these state is interpreted by our brain and we can remember the past things. To remember thing we force the neurons to represent certain states of the brain permanently or for any interesting or serious matter this is happened implicitly.	MEMORY It is not impossible to store the data permanently by using the secondary memory .In the similar way the required states of the registers can be stored permanently. And when required these information can be retrieved and used.

Natural Brain	Simulated Brain
PROCESSING When we take decision, think about something, or make any computation, Logical and arithmetic calculations are done in our neural circuitry .The past experience stored and the current input received are used and the states of certain neurons are changed to give the output .	PROCESSING In a similar way the decision making can be done by the computer by using some stored states and the received input and by performing some arithmetic and logical calculations .

Uploading human brain:

The uploading is possible by the use of small robots known as the Nanobots .These robots are small enough to travel through out our circulatory system. Traveling into the spine and brain, they will be able to monitor the activity and structure of our central nervous system.

They will be able to provide an interface with computers that is as close as our mind can be while we still reside in our biological form. Nanobots could also carefully scan the structure of our brain, providing a complete readout of the connections. This information, when entered into a computer, could then continue to function as us. Thus the data stored in the entire brain will be uploaded into the computer.

ADVANTAGES AND DISADVENTAGES

Advantages:

- We can remember things without any effort.
- Decision can be made without the presence of a person.
- Even after the death of a man his intelligence can be used.
- The activity of different animals can be understood. That means by interpretation of the electric impulses from the brain of the animals, their thinking can be understood easily.
- It would allow the deaf to hear via direct nerve stimulation, and also be helpful for many psychological diseases. By down loading the contents of the brain that was uploaded into the computer, the man can get rid from the mad ness.
- Disadvantages:
- Further, there are many new dangers these technologies will open. We will be susceptible to new form of harm.

- We become dependent upon the computer systems.
- Others may use technical knowledge against us.
- Computer viruses will pose an increasingly critical threat.
- The real threat, however, is the fear that people will have of new technologies. That fear may culminate in a large resistance. Clear evidence of this type of fear is found today with respect to human cloning.
- HARDWARE AND SOFTWARE REQUIRMENT
- A super computer.
- Memory with a very large storing capacity.
- Processor with a very high processing power.
- A very wide network.
- A program to convert the electric impulses from the brain to input signal, which is to b received by the computer, and vice versa.
- Very powerful Nanobots to act as the interface between the natural brain and the computer

CONCLUSION

In conclusion, we will be able to transfer ourselves into computers at some point. Most arguments against this outcome are seemingly easy to circumvent.

They are either simple minded, or simply require further time for technology to increase. The only serious threats raised are also overcome as we note the combination of biological and digital technologies.

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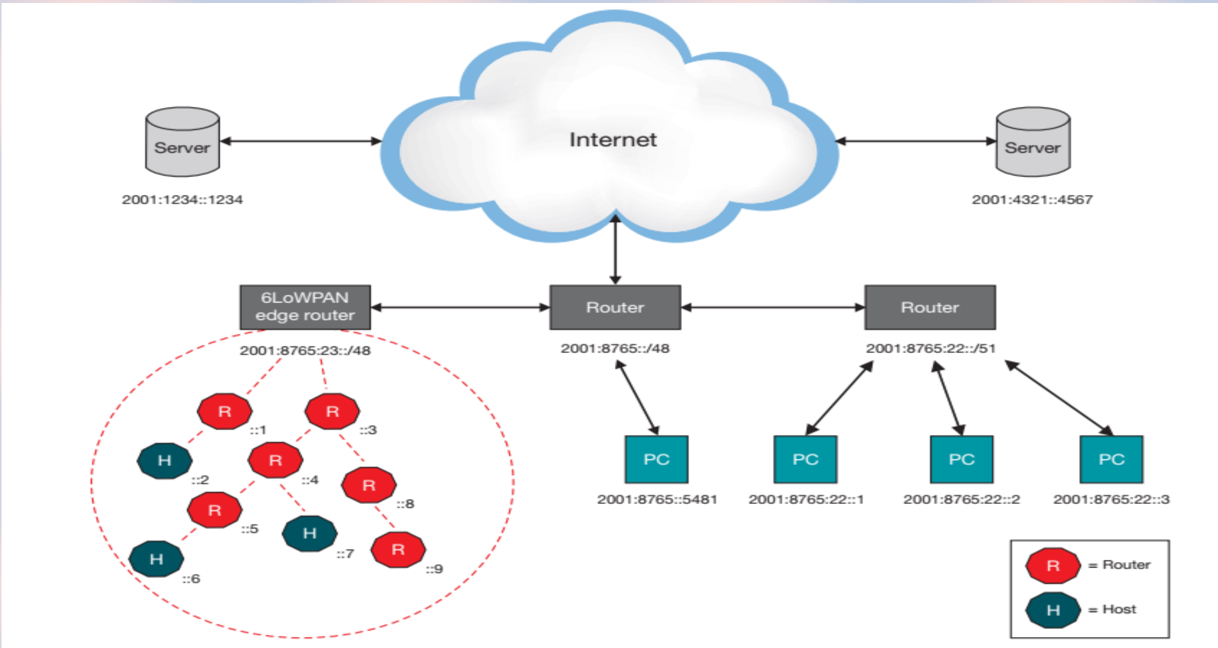
6LoWPA (IPV6 OVER LOW -POWER WIRELESS PERSONAL AREA NETWORKS.

Introduction

6LoWPAN is connecting more things to the cloud. Low-power, IP-driven nodes and large mesh network support make this technology a great option for Internet of Things (IoT) applications. As the full name implies "IPv6 over Low-Power Wireless Personal Area Networks" 6LoWPAN is a networking technology or adaptation layer that allows IPv6 packets to be carried efficiently within small link layer frames, such as those defined by IEEE 802.15.4. The use of an end-to-end, IP-based infrastructure takes full advantage of 30+ years of IP technology development, facilitating open standards and interoperability as largely demonstrated through the daily use of the Internet and its almost 3 billion users.

6LoWPAN is an open standard defined in RFC6282 by the Internet Engineering Task Force (IETF), the standards body that defines many of the open standards used on the Internet such as UDP, TCP and HTTP to name a few. A powerful feature of 6LoWPAN is that while originally conceived to support IEEE 802.15.4 low-power wireless networks in the 2.4-GHz band, it is now being adapted and used over a variety of other networking media including Sub-1 GHz low-power RF, Bluetooth



Smart, power line control (PLC) and low-power Wi-Fi.

6LoWPAN network architecture

Figure shows an example of an IPv6 network, including a 6LoWPAN mesh network. The uplink to the Internet is handled by the Access Point (AP) acting as an IPv6 router. Several different devices are connected to the AP in a typical setup, such as PCs, servers, etc. The 6LoWPAN network is connected to the IPv6 network using an edge router. The edge router handles three actions:

1) The data exchange between 6LoWPAN devices and the Internet (or other IPv6 network)
2) Local data exchange between devices inside the 6LoWPAN
3) The generation and maintenance of the radio subnet (the 6LoWPAN network).

By communicating natively with IP, 6LoWPAN networks are connected to other networks simply using IP routers. As shown in Figure 1, 6LoWPAN networks will typically operate on the edge, acting as stub networks. This means data going into the network is destined for one of the devices inside the 6LoWPAN. One 6LoWPAN network may be connected to other IP networks through one or more edge routers that forward IP datagrams between different media. Connectivity to other IP networks may be provided through any arbitrary link, such as Ethernet, Wi-Fi or 3G/4G. Because 6LoWPAN only specifies operation of IPv6 over the IEEE 802.15.4 standard, edge routers may also support IPv6 transition mechanisms to connect 6LoWPAN networks to IPv4 networks, suchas NAT64 defined in RFC 6146. These IPv6 transition mechanisms do not require the 6LoWPAN nodes to implement IPv4 in whole or in part.

Advantages of 6LoWPAN

Uses Open IP Standards

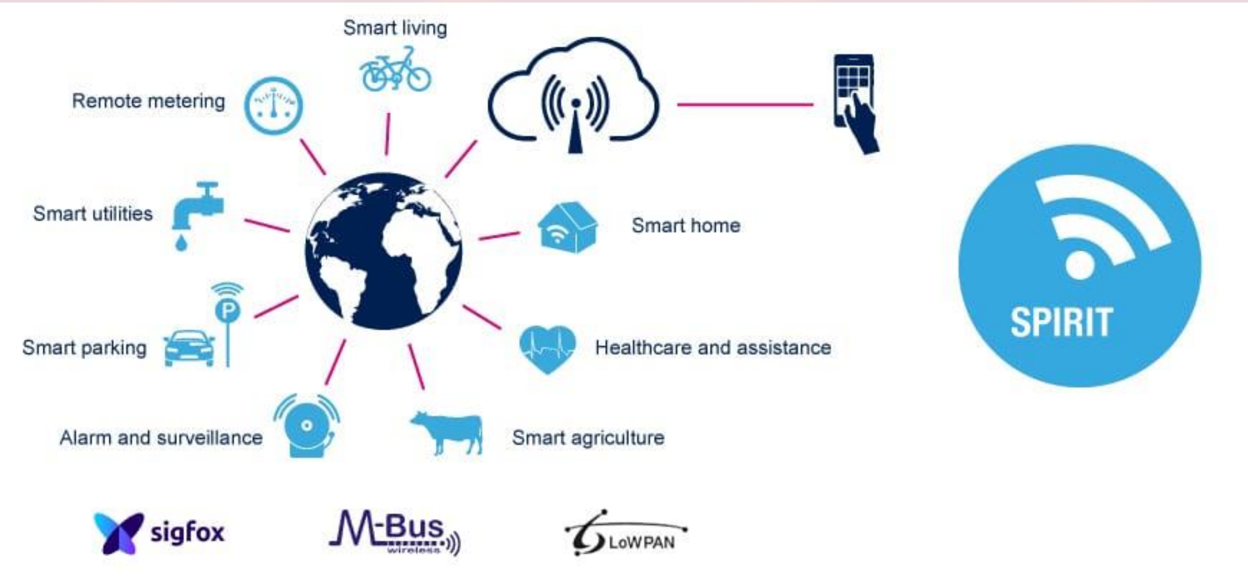
Offers End-To-End IP Addressable Nodes

Offers Self-Healing, Robust and Scalable Mesh Routing

Leaf Nodes Can Sleep For a Long Duration of Time

It is a Standard: RFC6282

6LoWPAN Application Areas



- Automation: There are enormous opportunities for 6LoWPAN to be used in many different areas of automation.
- Industrial monitoring: Industrial plants and automated factories provide a great opportunity for 6LoWPAN. Major savings can be made by using automation in every day practices. Additionally, 6LoWPAN can connect to the cloud which opens up many different areas for data monitoring and analysis.
- Smart Grid: Smart grids enable smart meters and other devices to build a micro mesh network. They are able to send data back to the grid operator's monitoring and billing system using the IPv6.
- Smart Home: By connecting your home IoT devices using IPv6, it is possible to gain distinct advantages over other IoT systems.

6LoWPAN Security

- 6LoWPAN can use AES-128 link layer security which is defined in IEEE 802.15.4. This provides link authentication and encryption.
- Further security is provided by the transport layer security mechanisms and runs over TCP.
- For system s where UDP is used, the transport layer protocol defined under RFC 6347 can be used.

Article on Skinput Technology

ABSTRACT

Skinput is a technology that appropriates the human body for acoustic transmission, allowing the skin to be used as an input surface. In particular, the location of finger taps on the arm and hand is resolved by analyzing mechanical vibrations that propagate through the body. These signals are collected using a novel array of sensors worn as an armband. This approach provides an always available, naturally portable, and on-body finger input system. The capabilities, accuracy and limitations of this technique are assessed through a two-part, twenty- participant user study.

INTRODUCTION

Devices with significant computational power and capabilities can now be easily carried on our bodies. However, their small size typically leads to limited interaction space and consequently diminishes their usability and functionality. Since we cannot simply make buttons and screens larger without losing the primary benefit of small size, we consider alternative approaches that enhance interactions with small mobile systems. One option is to opportunistically appropriate surface area from the environment for interactive purposes. For example a technique that allows a small mobile device to turn tables on which it rests into a gestural finger input canvas. However, tables are not always present, and are not usable in a mobile context, However, there is one surface that has been previous overlooked as an input canvas, and one that happens to always travel with us: our skin. Appropriating the human body as an input device is appealing not only because we have roughly two square meters of external surface area, but also because much of it is easily accessible by our hands (e.g., arms, upper legs, torso).

Skinput is a method that allows the body to be appropriated for finger input using a novel, non- invasive, wearable bio-acoustic sensor

In Skinput, a keyboard, menu, or other graphics are beamed onto a user's palm and forearm from a pico projector embedded in an armband. An acoustic detector in the armband then determines which part of the display is activated by the user's touch. As the researchers explain, variations in bone density, size, and mass, as well as filtering effects from soft tissues and joints, mean different skin locations are acoustically distinct. Their software matches sound frequencies to specific skin locations, allowing the system to determine which “skin button” the user pressed.

The prototype system then uses wireless technology like Bluetooth to transmit the commands to the device being controlled, such as a phone, iPod, or computer. Twenty volunteers who have tested the system have provided positive feedback on the ease of navigation. The researchers say the system also works well when the user is walking or running.

HARDWARE ARCHITECTURE

To expand the range of sensing modalities for always available input systems, a novel input technique that allows the skin to be used as a finger input surface is described in this paper and is named as Skinput. In this prototype system, the focus is on the arm (although the technique could be applied elsewhere). This is an attractive area to appropriate as it provides considerable surface area for interaction, including a contiguous and flat area for projection (discussed subsequently).

Furthermore, the forearm and hands contain a complex assemblage of bones that increases acoustic distinctiveness of different locations. To capture this acoustic information a wearable armband that is non-invasive and easily removable is developed. In this section, the mechanical phenomenon that enables Skinput is discussed, with a specific focus on the mechanical properties of the arm. The Skinput sensor and the processing techniques used to segment, analyze, and classify bio-acoustic signals are studied in this section.

Major Components are

- Bio-Acoustics
- Sensing
- Armband Prototype
- Processing

APPLICATIONS

A method for controlling an iPod with skin-touch based input to select music tracks while jogging.

- It turns the fingers into a controller for the game of Tetris.
- It may be used for dialing your phone on your arm.

SKINPUT

To expand the range of sensing modalities for always available input systems, we introduce *Skinput*, a novel input technique that allows the skin to be used as a finger input surface. In our prototype system, we choose to focus on the arm (although the technique could be applied elsewhere). This is an attractive area to appropriate as it provides considerable surface area for interaction, including a contiguous and flat area for projection (discussed subsequently). Further more, the forearm and hands contain a complex assemblage of bones that increases acoustic distinctiveness of different locations. To capture this acoustic information, we developed a wearable armband that is non-invasive and easily removable In this section, we discuss the mechanical phenomena that enables *Skinput*, with a specific focus on the mechanical properties of the arm. Then we will describe the *Skinput* sensor and the processing techniques we use to segment, analyze, and classify bio-acoustic signals.

BIO-ACOUSTICS

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 (Figure 2). When shot with a high-speed camera, these appear as ripples, which propagate outward from the point of contact . The amplitude of these ripples is correlated to both the tapping force and to the volume and compliance of soft tissues under the impact area. 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. These longitudinal (compressive) waves travel through the soft tissues of the arm, exciting the bone, which is much less deformable then the soft tissue but can respond to mechanical excitation by rotating and translating as a rigid body. This excitation vibrates soft tissues surrounding the entire length of the bone, resulting in new longitudinal waves that propagate outward to the skin. We highlight these two separate forms of 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. Roughly speaking, higher frequencies propagate more readily through bone than through soft tissue, and bone conduction carries energy over larger distances than soft tissue conduction. While we do not explicitly model the specific mechanisms of conduction, or depend on these mechanisms for our analysis, we do believe the success of our technique depends on the complex acoustic patterns that result from mixtures of these modalities.Similarly, we also believe that joints play an important role in making tapped locations acoustically distinct. Bones are held together by ligaments, and joints often include additional biological structures such as fluid cavities. This makes joints behave as acoustic filters. In some cases, these may simply dampen acoustics; in other cases, these will selectively attenuate specific frequencies, creating location specific acoustic signatures.

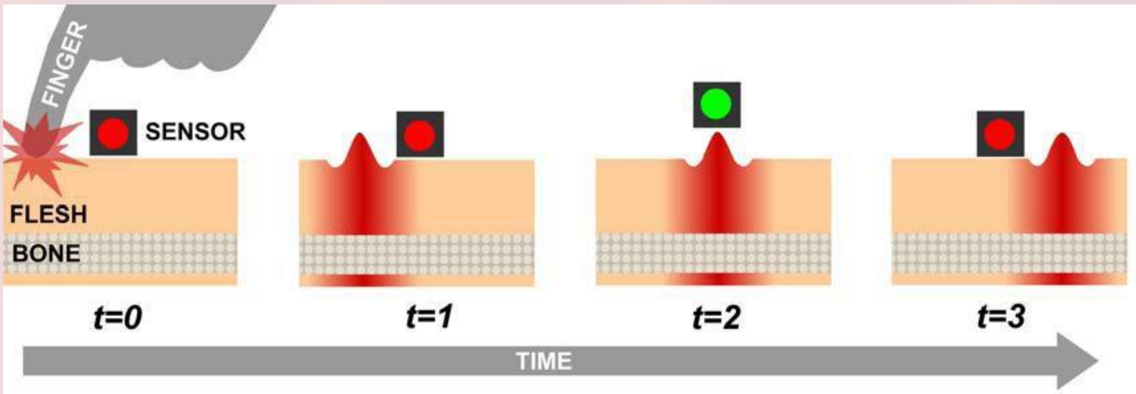


Figure 2. Transverse wave propagation: Finger impacts displace the skin, creating transverse waves

(ripples). The sensor is activated as the wave passes underneath it.

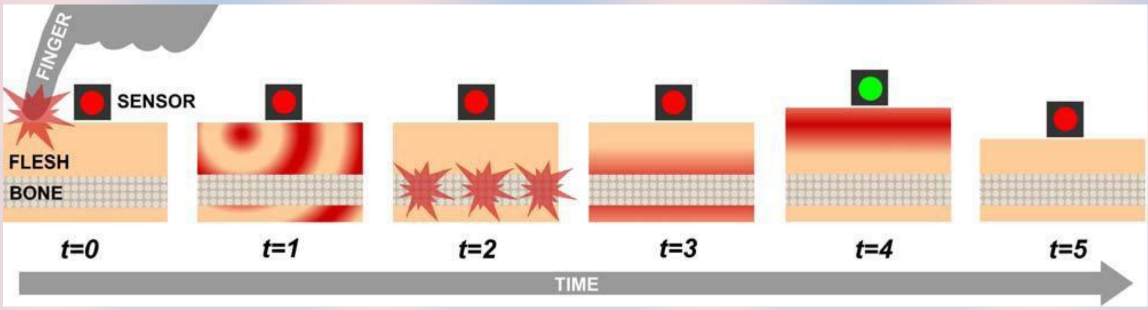
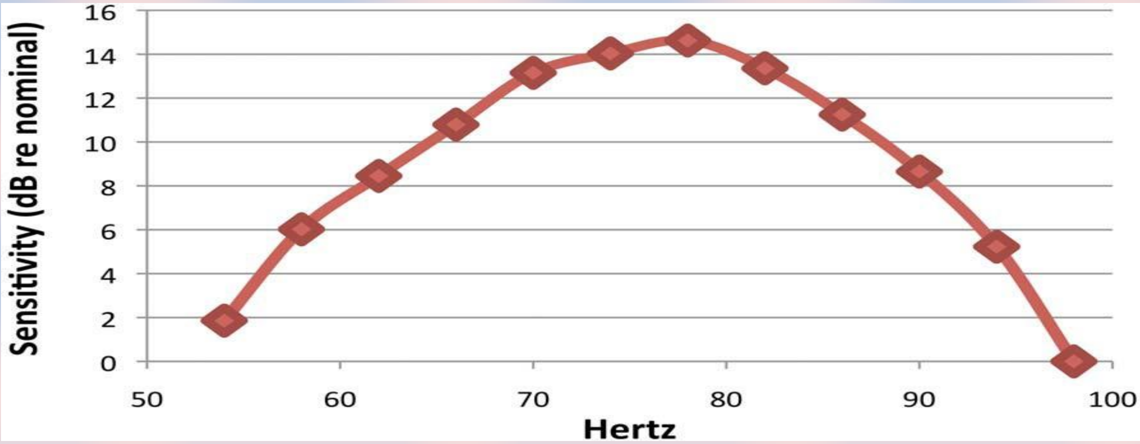


Figure 3. Longitudinal wave propagation: Finger impacts create longitudinal (compressive) waves that cause internal skeletal structures to vibrate. This, in turn, creates longitudinal waves that emanate outwards from the bone (along its entire length) toward the skin.

SENSING

To capture the rich variety of acoustic information described in the previous section, we evaluated many sensing technologies, including bone conduction microphones, conventional microphones coupled with stethoscopes, piezo contact microphones, and accelerometers. Ho wever, these transducers were engineered for very different applications than measuring acoustics transmitted through the human body. As such, we found them to be lacking in several significant ways. Foremost, most mechanical sensors are engineered to provide relatively flat response curves over the range of frequencies that is relevant to our signal. This is a desirable property for most applications where a faithful representation of an input signal – uncolored by the properties of the transducer – is desired. However, because only a specific set of frequencies is conducted through the arm in response to tap input, a flat response curve leads to the capture of irrelevant frequencies and thus to a high signal- to-noise ratio. While bone conduction microphones might seem a suitable choice for *Skinput*, these devices are typically engineered for capturing human voice, and filter out energy below the range of human speech (whose lowest frequency is around 85Hz). Thus most sensors in this category were not especially sensitive to lower-frequency signals (e.g., 25Hz), which we found in our empirical pilot studies to be vital in characterizing finger taps. To overcome these challenges, we moved away from a single sensing element with a flat response curve, to an array of highly tuned vibration sensors. Specifically, we employ small, cantilevered piezo films (MiniSense100, Measurement Specialties, Inc.). By adding small weights to the end of the cantilever, we are able to alter the resonant frequency, allowing the sensing element to be responsive to aunique, narrow, low-frequency band of the acoustic spectrum. Adding more mass lowers the range of excitation to which a sensor responds; we weighted each element such that it aligned with particular frequencies that pilot studies showed to be useful in characterizing bio-acoustic input. Figure 4 shows the response curve for one of our sensors, tuned to a resonant frequency of 78Hz.



The curve shows a ~14dB drop-off ±20Hz away from the resonant frequency. Additionally, the cantilevered sensors were naturally insensitive to forces parallel to the skin (e.g., shearing motionscaused by stretching). Thus, the skin stretch induced by many routine movements (e.g., reaching for a doorknob) tends to be attenuated. However, the sensors are highly responsive to motion perpendicular to the skin plane – perfect for capturing transverse surface waves (Figure 2) and longitudinal waves emanating from interior structures (Figure 3).

Finally, our sensor design is relatively inexpensive and can be manufactured in a very small form factor (e.g., MEMS), rendering it suitable for inclusion in future mobile devices (e.g., an arm-mounted audio player).

ARMBAND PROTOTYPE

Our final prototype, shown in Figures 1 and 5, features two arrays of five sensing elements, incorporated into an armband form factor. The decision to have two sensor packages was motivated by our focus on the arm for input. In particular, when placed on the upper arm (above the elbow), we hoped to collect acoustic information from the fleshy bicep area in addition to the firmer area on the underside of the arm, with better acoustic coupling to the *Humerus*, the main bone that runs from shoulder to elbow. When the sensor was placed below the elbow, on the forearm, one package was located near the *Radius*, the bone that runs from the lateral side of the elbow to the thumb side of the wrist, and the other near the *Ulna*, which runs parallel to this on the medial side of the arm closest to the body. Each location thus provided slightly different acoustic coverage and information, helpful in disambiguating input location. Based on pilot data collection, we selected a different set of resonant frequencies for each sensor package (Table 1). We tuned the upper sensor package to be more sensitive to lower frequency signals, as these were more prevalent in fleshier areas. Conversely, we tuned the lower sensor array to be sensitive to higher frequencies, in order to better capture signals transmitted though (denser) bones.

PROCESSING

In our prototype system, we employ a Mackie Onyx 1200F audio interface to digitally capture data from the ten sensors (http://mackie.com). This was connected via Firewire to a conventional desktop computer, where a thin client written in C interfaced with the device using the Audio Stream Input/ Output (ASIO) protocol. Each channel was sampled at 5.5kHz, a sampling rate that would be considered too low for speech or environmental audio, but was able to represent the relevant spectrum of frequencies transmitted through the arm. This reduced sample rate (and consequently low processing bandwidth) makes our technique readily portable to embedded processors. For example, the ATmega168 processor employed by the Arduino platform can sample analog readings at 77kHz with no loss of precision, and could therefore provide the full sampling power required for *Skinput* (55kHz total). Data was then sent from our thin client over a local socket to our primary application, written in Java. This program performed three key functions. First, it provided a live visualization of the data from our ten sensors, which was useful in identifying acoustic features (Figure 6). Second, it segmented inputs from the data stream into independent instances (taps). Third, it classified these input instances.

The audio stream was segmented into individual taps using an absolute exponential average of all ten channels (Figure6, red waveform). When an intensity threshold was exceeded (Figure 6, upper blue line), the program recorded the timestamp as a potential start of a tap. If the intensity did not fall below a second, independent “closing” threshold (Figure 6, lower purple line) between 100ms and 700ms after the onset crossing (a duration we found to be the common for finger impacts), the event was discarded. If start and end

crossings were detected that satisfied these criteria, the acoustic data in that period (plus a 60ms buffer on either end) was considered an input event (Figure 6, vertical green regions).

Although simple, this heuristic proved to be highly robust, mainly due to the extreme noise suppression rovided by our sensing approach.

Upper Array	25 Hz	27 Hz	30 Hz	38 Hz	78 Hz
Lower Array	25 Hz	27 Hz	40 Hz	44 Hz	64 Hz

Table 1. Resonant frequencies of individual elements in the two sensor packages.

After an input has been segmented, the waveforms are analyzed. The highly discrete nature of taps (i.e. point impacts) meant acoustic signals were not particularly expressive over time (unlike gestures, e.g., clenching of the hand). Signals simply diminished in intensity overtime. Thus, features are computed over the entire input window and do not capture any temporal dynamics. We employ a brute force machine learning approach, computing 186 features in total, many of which are derived combinatorially. For gross information, we include the average amplitude, standard deviation and total (absolute) energy of the waveforms in each channel (30 features). From these, we calculate all average amplitude ratios between channel pairs (45 features). We also include an average of these ratios (1 feature). We calculate a 256-point FFT for all ten channels, although only the lower ten values are used (representing the acoustic power from 0Hz to 193Hz), yielding 100 features. These are normalized by the highest-amplitude FFT value found on any channel. We also include the center of mass of the power spectrum within the same 0Hz to 193Hz range for each channel, a rough estimation of the fundamental frequency of the signal displacing each sensor (10 features). Subsequent feature selection established the all- pairs amplitude ratios and certain bands of the FFT to be the most predictive features. These 186 features are passed to a Support Vector Machine (SVM) classifier.

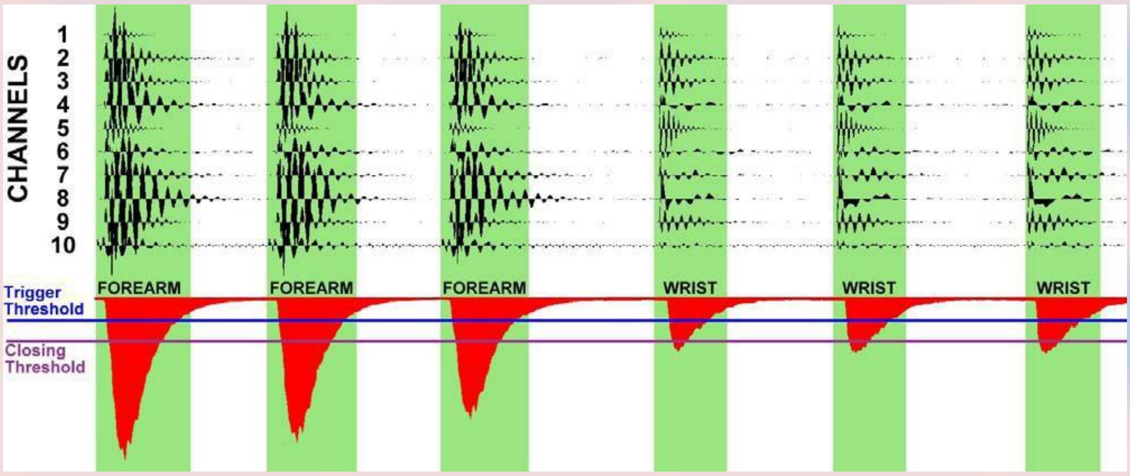


Figure 6: Ten channels of acoustic data generated by three finger taps on the forearm, followed by three taps on the wrist. The exponential average of the channels is shown in red. Segmented input windows are highlighted in green. Note how different sensing elements are actuated by the two locations.

A full description of VMs is beyond the scope of this paper (see [4] for a tutorial). Our software uses the implementation provided in the Weka machine learning toolkit [28]. It should be noted, however, that other, more sophisticated classification techniques and features could be employed. Thus, the results presented in this paper should be considered a baseline. Before the SVM can classify input instances, it must first be trained to the user and the sensor position. This stage requires the collection of several examples for each input location of interest. When using *Skinput* to recognize live input, the same 186 acoustic features are computed on-thefly for each segmented input. These are fed into the trained SVM for classification. We use an event model in our software once an input is classified,

an event associated with that location is instantiated. Any interactive features bound to that event are fired. As can be seen in our video, we readily achieve interactive speeds.

Advantages:

1. **Don’t need any Keyboard.**
2. Don’t need any Keyword.
3. Provide interactive play expertise.
4. Provide straightforward navigation by providing giant buttons.
5. Arm acts as an Instrument.
6. Respond to numerous Hand Gestures.
7. Easy to access in absence of Mobile.

Disadvantages:

1. Visibility downside to the person having tattoos on its skin.
2. It will cause the folks to be socially distracted.
3. Provide solely five buttons.
4. Body mass index can scale back the accuracy.
5. Arm band is large.

Pico-Projector in Mobile devices

By this technology, 5 skin location detection are distributed with accuracy of over ninety fifth. It's the technology that's not affected together with your movement as if you're moving or walking, you'll be able to use it with identical potency.

Operation

Skinput has been publicly demonstrated as an armband, which sits on the biceps. This prototype contains ten small cantilevered Piezo elements configured to be highly resonant, sensitive to

frequencies between 25 and 78 Hz. This configuration acts like a mechanical Fast Fourier transform and provides extreme out-of-band noise suppression, allowing the system to function even while the user is in motion. From the upper arm, the sensors can localize finger taps provided to any part of the arm, all the way down to the finger tips, with accuracies in excess of 90% (as high as 96%

for five input locations).[5] Classification is driven by a support vector machine using a series of time-independent acoustic features that act like a fingerprint. Like speech recognition systems, the Skinput recognition engine must be trained on the "sound" of each input location before use. After training, locations can be bound to interactive functions, such as pause/play song, increase/decrease music volume, speed dial, and menu navigation.

Conclusion

In this paper, the approach is to appropriate the human body as an input surface. A novel, wearable bio-acoustic sensing array built into an armband in order to detect and localize finger taps on the forearm and hand is developed. Results from experiments have shown that the system performs very well for a series of gestures, even when the body is in motion.

Additionally, presented initial results demonstrating other potential uses of the approach, which are hoped to further explore in future work. These include single-handed gestures and taps with different parts of the finger.

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3D Internet

Introduction

3D Internet, also known as virtual worlds, is a powerful new way for you to reach consumers, business customers, co-workers, partners, and students. It combines the immediacy of television, the versatile content of the Web, and the relationship-building strengths of social networking sites like Face book.

Yet unlike the passive experience of television, the 3D Internet is inherently interactive and engaging. Virtual worlds provide immersive 3D experiences that replicate (and in some cases exceed) real life.

People who take part in virtual worlds stay online longer with a heightened level of interest. To take advantage of that interest, diverse businesses and organizations have claimed an early stake in this fast-growing market.

They include technology leaders such as IBM, Microsoft, and Cisco, companies such as BMW, Toyota, Circuit City, Coca Cola, and Calvin Klein, and scores of universities, including Harvard, Stanford and Penn State.

What is 3D Internet?

3D Internet is the next generation after the current 2d web.3D Internet consists of interconnected services, presented as virtual worlds.

Imagine a set-up of interconnected virtual worlds inhabited by users who can visit and consume services through "teleporting" from one world to another.

3D Internet will rely on the same basic technology and components as that of a traditional browser, and it will interact with the same search engines and servers. Aside from the use of 3D computer graphics and personalized avatars, the important difference lies in a much more social experience compared to the two-dimensional Internet of today.

3D Internet is incredibly social. If you're reading a document, you can see other people reading the same document. You connect organically with other people that share your interests and consume the same services that you do

3D Internet: Why?

One of the often heard arguments against the 3D Internet is in the form of the question “why do we need it?” For most of its users the Internet is a familiar, comfortable medium where we communicate with each other, get our news, shop, pay our bills, and more.

We are indeed so much used to and dependant on its existence that we don’t think about its nature anymore just like we do not think about Ohm’s law when we turn on the lights. From this perspective what we have, i.e. the 2D version, seems “sufficient” and the 3D Internet is yet another fad.

However, if we stop and think about the nature of the Internet for a moment we realize that it is nothing but a virtual environment (cyberspace) where people and organizations interact with each other and exchange information. Once this fact is well understood, the question can be turned on its head and becomes “why do we restrict ourselves to 2D pages and hyperlinks for all these activities?”

Navigating hierarchical data structures is often cumbersome for large data sets. Unfortunately, the Internet as we know is organized as a flat abstract mesh of interconnected hierarchical documents. A typical 2D website is an extremely abstract entity and consists of nothing but a bunch of documents and pictures. Within the website, at every level of the interaction, the developers have to provide the user immediate navigational help.

Otherwise, the user would get lost sooner or later. Since this is a very abstract environment, there is no straightforward way of providing a navigation scheme which would be immediately recognizable to human beings. The situation is not any better when traveling between websites.. It is no surprise that Google is the most powerful Internet Company of our times.

HOW 3D INTERNET WORKS?

- Sing available virtual platforms i.e. Second Life.
- By using artificial intelligence.
- Using 3d eyewear like Google Glass.
- Implementing Sixth-Sense technology.
- Using sensors and holographic image projections.

Applications of 3D Internet

Education

3D Internet can be used as a platform for education by many institutions, such as colleges, universities, libraries and government entities. There are subjects such as chemistry and English in which Instructors and researchers would favor 3D Internet because it is more personal than traditional distance learning.

Religion

Religious organizations can make use of the 3D Internet to open virtual meeting places within specified locations.

Embassies

We could create embassies in 3D Internet, where visitors will be able to talk face-to-face with a computer-generated ambassador about visas, trade and other issues.

Live sport entertainment

Popular forms of live entertainment could also be placed into the 3D Internet.

Many sports allow the users to watch or participate in many popular activities. Sporting leagues like Cricket, Football, Professional Wrestling, boxing, and auto racing could be placed in the 3D Internet for it's users to play in the 3D environment.

Arts

The modeling in 3D Internet would allow the artists to create new forms of art, that in many ways are not possible in real life due to physical constraints or high associated costs. In 3D Internet artists could display their works to an audience across the world. This has created an entire artistic culture on its own where many residents who buy or build homes can shop for artwork to place there. Gallery openings even allow art patrons to "meet" and socialize with the artist responsible for the artwork and has even led to many real life sales. Live music performances could also be enabled in the 3D Internet.

3D Internet Technology and Components

Though the technology and components used for 3D internet are same as used in traditional internet also it interacts with the same servers and search engines. But being more social 3D internet is different from traditional 2D internet.

The wonderful thing about 3D internet is that participants learn as much from each other as from talking to any official source of information. 3D internet search is also as advanced as it opens a vast array of possibilities when it comes to search and browse data.

Through 3D internet multi users can read the same documents. You connect organically with other people that share your interests and access the same service as other use.
People can also watch online 3D movies via internet with no buffering time.

3D internet also offers other facilities like virtual meetings, support groups, academics, training chats and shopping.

3D Internet Features

One of the best features of 3D internet is that it also supports 3D internet TV. Now Sony is thinking to launch new technology for 3D TV that is 3D internet TV and HDTV 3D internet TV Wi-Fi.

In such TVs internet connectivity will be built up in TV via Wi-Fi. The picture and graphic quality will also be tremendously improved along with a lot of TV channels that is building in internet connectivity with 3D TV, to improve quality and to increase number of channels that user may access.

With Sony internet 3D TV, it will also be possible to enjoy other services on TV such as Skype.

Technical Implications

- **Speed:**

Internet speed is one of the most significant implications that are being faced by the 3D Internet. A research shows that not many countries in the world are in a state to fulfill the internet speeds that are required for the implementation of the 3D Internet. Here, in the below chart we can see the average broadband speed in various countries.

- **Hardware:**

Hardware implications are not quite serious implications to be thought of, because the main Hardware implication that we face to implement the 3D Internet is that the display device used to display the images are 2D in nature, but with the inclusion of the 3D internet there would be great difficulty to view the 3D objects in the 2D devices.

Conclusion

3D Internet, also known as virtual worlds, is a powerful new way for you to reach consumers, business customers, co-workers, partners, and students.

It combines the immediacy of television, the versatile content of the Web, and the relationship-building strengths of social networking sites like Face book.

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Abbreviation

AWS	-	Amazon Web Services
GCP	-	Google Cloud Platform
GCS	-	Google Cloud Storage
VPG	-	Virtual Private Gateway
UI/UX	-	User Interface/User Experience
RDSMS	-	Relational Data Stream Management System
CORS	-	Cross-Origin Resource Sharing
AVX	-	Advanced Vector Extensions

Quiz

01.The HDMI interface was designed for what type of devices?

A Mobile phones

B Tablets

C Televisions

D Digital cameras

02. Which term describes the maximum data transfer rate of a network connection?

A Backbone

B Bandwidth

C Ping

D Latency

03. Small toggle switches used to configure hardware devices are also called what?

A Jumpers

B Packets

C Beacons

D Headers

04. One billionth of a meter is also known as what?

A Micrometer

B Macrometer

C Nanometer

D Picometer

05.Which application might be categorized as PIM software?

A Microsoft Outlook

B Apple Pages

C Adobe Photoshop

D Parallels Desktop

06.What version of macOS followed Mojave?

A Sierra

B El Capitan

C Big Sur

D Catalina

07.What type of device might is considered secondary memory?

A RAM

B VRAM

C CPU

D SSD

08. What is another name for a person who only uses high-end computing equipment?

A Ultra user

B Power user

C Elite user

D Mega user

09. Which of the following data storage units of measurement is the largest?

A Exbibyte

B Pebibyte

C Yobibyte

D Zebibyte

10. Which education board has launched the mobile application "Dost for Life"?

A. ICSE Board

B. CBSE Board

C. Open Board

D. All of above

Acknowledgement

We are highly thankful for reading out this compilation and hope it will be use full for you in our day today professional and personal life .We would like to hear your interest areas, suggestions from you to make this newsletter more informative and interesting. Your views will definitely help us to create this newsletter as an effective medium to reach you with latest development in the fields of communication and technology.

1	2	3	4	5	6	7	8	9	10
C	**B**	**A**	**C**	**A**	**C**	**D**	**B**	**C**	**B**

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