COSCENGERS INSPIRE-2017

Volume - 1

Department Vision

- To evolve into a centre of learning that imparts quality education in Computer Science and Engineering to produce highly competent professionals.

Department Mission

- Impart computing and technical skills with an emphasis on professional competency and human values

- Enrich the learning aptitude to face the dynamic environment of the Computer Industry

- Enhance the analytical and problem-solving capability through contests and technical seminars

Program Educational Objectives(PEOs)

- PEO-1: Apply both fundamental and advanced knowledge to analyse, design and develop innovative computing products.

- PEO-2: Design and develop interdisciplinary and innovative software systems for real-world problems.

- PEO-3: Inculcate soft skills, ethical conduct and an ability to engage in lifelong learning to serve the societal and environmental needs.

PRINCIPAL'S MESSAGE

It's pleasure to know that the Computer Science and Engineering Department of the college is bringing out the magazine of CSE department "Coscengers Inspire" for the year 2017-2018.

This institution constantly strives in the all-round development of the students through its endless efforts. *Coscengers Inspire* is one such endeavor to provide a platform for students to showcase their talents ranging from serious thoughts is the utterly playful. The inspiring women students at GVPCEW are brimming with zeal for life empowering themselves with skills and creativity.

I'm happy that there is a dedicated team of staff and students who have brought out *Coscengers Inspire*. They have presented the fantastic achievements of CSE students of GVPCEW in the field of academics, sports and extra- curricular activities.

I am sure the reader would find many an article that is informative and entertaining.

I wish all our students soar high with the wings of education to bring glory to themselves and their performance.

-Dr. E.V. Prasad

EDITOR'S NOTE

It gives an immense joy and satisfaction to introduce our very own college magazine – COSCENGERS INSPIRE. Here comes 'COSCENGERS INSPIRE', the magazine of GVPCEW from the CSE department, for the year 2017-2018. The name of the magazine may seem peculiar, but it just means 'the speed at which the technological innovation or advancement is occurring'. So this time, it is the dedication of students which attempts to bring out the talent concealed within our student community along with teachers. It is the willingness to share knowledge, concerns and special insights with fellow beings that has made this magazine possible. This magazine includes technical articles, biography of a renowned scientist as well as facts regarding computer science, few tricky puzzles with funny corner and exhibits the literary skills and the achievements of students. These contributions have required a generous amount of time and effort. Thank you very much for all the editorial team members who worked for this magazine. It is very glad to take the opportunity of expressing our considerable appreciation to all the contributors of this magazine. Lastly, the contributors and readers of 'COSCENGERS INSPIRE' are always welcome to send us your invaluable feedback and ideas for further improvement of this magazine.

Introduction to AI Chips

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Introduction

"Artificial intelligence chips", or AI chips for short, also sometimes referred to as AI accelerators. AI chips, as the term suggests, refers to a new generation of microprocessors which are specifically designed to process artificial intelligence tasks faster, using less power. Artificial intelligence heavily banks on specialized processors completing the CPU. Even the highly-advanced CPU may not improve the speed of training an AI model.
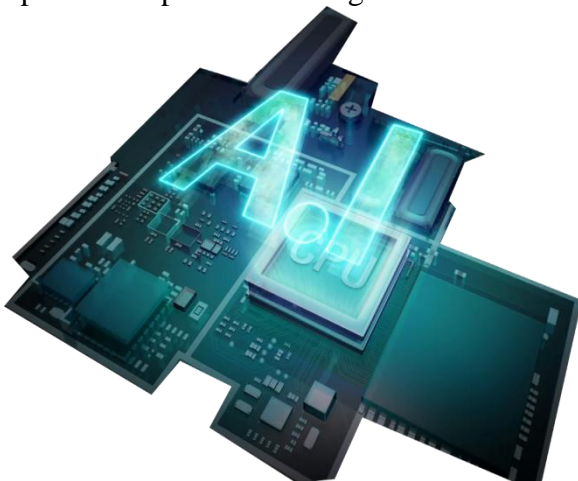
Difference between AI chip and Normal Chips

when all chips of any type process zeros and ones

AI Chip is capable of AI tasks.We can use our cars as metaphors. "A general microprocessor is your typical family car that might have good speed and steering capabilities. An AI chip is a supercar, which typically has a more powerful engine and super- sensitive steering, and a lower profile for less wind resistance, and so on general microprocessor is an all-purpose system, AI processors are embedded with logic gates and highly parallel calculation systems that are more suited to typical AI tasks such as image processing, machine vision, machine learning, deep learning, artificial neural networks, and so on..

AI Chip Manufacturing Companies

AI chip market is currently valued at around $7 billion, but is forecast for phenomenal growth to more than $90 billion in the next four years, according to a study by Allied Market Research.

1. Alphabet

Google's parent company is overseeing the development of artificial intelligence technologies in a variety of sectors, including cloud computing, data centers, mobile devices, and desktop computers. Probably most noteworthy is its Tensor Processing Unit, an ASIC specifically designed for Google's TensorFlow programming framework, used mainly for machine learning and deep learning, two branches of AI. Google's Cloud TPU is a data center or cloud solution and is about the size of a credit card, but the Edge TPU is smaller than a one-cent coin and is designed for "edge" devices, referring to devices at the edge of a network, such as smartphones and tablets and machines used by the rest of us, outside of data centers. Having said that, analysts who observe this market more closely say Google's Edge TPU is unlikely to feature in the company's own smartphones and tablets anytime soon, and is more likely to be used in more high-end, enterprise and expensive machines and devices.

2. Apple

Apple has been developing its own chips for some years and could eventually stop using suppliers such as Intel, which would be a huge shift in emphasis. But having already largely disentangled itself from Qualcomm after a long legal wrangle, Apple does look determined to go its own way in the AI future. The company has used its A11 and A12 "Bionic" chips in its latest iPhones and iPads. The chip uses Apple's Neural Engine, which a part of the circuitry that is not accessible to third-party apps. The A12 Bionic chip is said to be 15 percent faster than its previous incarnation, while using 50 percent of the power. The A13 version is in production now, according to Inverse, and is likely to feature in more of the company's mobile devices this year. And considering that Apple has sold more than a billion mobile devices, that's a heck of a ready-made market, even without its desktop computer line, which still only accounts for only 5 percent of the overall PC market worldwide.

3. Arm

Arm, or ARM Holdings, produces chip designs which are used by all the leading technology manufacturers, including Apple. As a chip designer, it doesn't manufacture its own chips, which sort of gives it an advantage in perhaps the way Microsoft had an advantage by not making its own computers. In other words, Arm is hugely influential in the market. The company is currently developing AI chip designs along three main tracks: Project Trillium, a new class of processors that are "ultra-efficient" and scalable, aimed at machine learning applications; Machine Learning Processor, which is self-explanatory; and Arm NN, short for neural networks, a processor designed to work with TensorFlow, Caffe, which is a deep learning framework, and other structures.

4.Intel

The world's largest chipmaker was reported to have been generating $1 billion in revenue from selling AI chips as far back as 2017. Actually, Intel is not currently the world's largest chipmaker, but it probably was at the time. And the processors being considered in that report were of the Xeon range, which is not actually AI-specific, just a general one that was enhanced to deal with AI better. While it may continue to improve Xeon, Intel has also developed an AI chip range called "Nervana", which are described as "neural network processors". Artificial neural networks mimic the workings of the human brain, which learns through experience and example, which is why you often hear about machine and deep learning systems needing to be "trained". With Nervana, scheduled to ship later this year, Intel appears to be prioritizing solving issues relating to natural language process and deep learning.

5.Amazon

Having practically invented the cloud computing market, with its Amazon Web Services business unit, it seems logical that Amazon gets into the AI chip market, especially as its data centers could probably be made more efficient through their integration. The world's largest online retailer unveiled its AWS Inferentia AI chip towards the end of last year. It's still yet to be formally launched, but even when it is, it's unlikely to be sold to outside companies, just supplied to Amazon group businesses.

6. Facebook

Maybe we shouldn't include this company on the list because it's only just recently entered

into an agreement with Intel on the development of an AI chip. But Facebook has launched a number of innovative hardware products for the data center, so it's probably worth watching what it does in the AI chip market. When inferencing, the model requires extra hardware to do complex mathematical computations to make tasks faster like facial recognition and object detection. In the year 2019, chip manufacturers like NVIDIA, Intel, ARM, AMD, and Qualcomm will ship specialized chips capable of making the execution of AI-enabled applications much faster.

Such chips will be optimized for particular utilization and scenarios concerning computer vision, speech recognition, and natural language processing. Future apps from the automobile and healthcare industries will bank on these chips to provide intelligence to end-users. In 2019, hyperscale infrastructure organizations like Microsoft, Amazon, Facebook, and Google will invest more in custom chips that are based on field programmable gate arrays (FPGA) and application specific integrated circuits (ASIC).

To run modern workloads based on AI and high performance computing (HPC), these chips will be optimized. Some of these chips will also help advanced databases to enhance query processing and predictive analytics.

References

[1] Sze, Vivienne., et al. "Efficient processing of deep neural networks: A tutorial and survey." Proceedings of the IEEE 2017,105(12): 2295-2329. DOI: 10.1109/JPROC.2017.2761740

[2] T.N. Theis., et al. "The End of Moore's Law: A New Beginning for Information Technology," Invited paper, IEEE Computing in Science & Engineering, 2017,19 (2): 41-50. DOI: 10.1109/ MCSE.2017.29

[3] M. M. Sabry Aly., et al. "Energy-Efficient Abundant-Data Computing: The N3XT 1,000X," IEEE Computer, 2015, 48(12): 24 – 33. DOI: 10.1109/MC.2015.376

[4] N. P. Joupp., et al. "In-datacenter performance analysis of a tensor processing unit". In Proceedings of the 44th Annual International Symposium on Computer Architecture(ISCA) 2017, 1-12. DOI: 10.1145/3079856.3080246

[5] D. Bankman., et. al. "An Always-On 3.8μJ/86% CIFAR-10 Mixed-Signal Binary CNN Processor with All Memory on Chip in 28nm CMOS," Solid-State Circuits Conference (ISSCC), 2018 IEEE International. IEEE, 2018, 222 – 224. DOI: 10.1109/ISSCC.2018.8310264

[6] J, Lee., et al. "UNPU: A 50.6TOPS/W Unified Deep Neural Network Accelerator with 1b-to-16b Fully-Variable Weight Bit-Precision" Solid-State Circuits Conference (ISSCC), 2018 IEEE International. IEEE, 2018, 218 – 220. DOI: 10.1109/ISSCC.2018.8310262

[7] A. Parashar., et al. "SCNN: An accelerator for compressed-sparse convolutional neural networks." 2017 ACM/IEEE ISCA, DOI: 10.1145/3079856.3080254

[8] M, Bert., et al. "14.5 envision: A 0.26-to-10tops/w subword-parallel dynamic-voltageaccuracy-frequency-scalable onvolutional neural network processor in 28nm FDSOI." Solid-State Circuits Conference (ISSCC), 2017 IEEE International. IEEE, 2017, 246 – 247. DOI: 10.1109/ISSCC.2017.7870353

[9] S. Y. Yin., et al. "A 1.06-to-5.09 TOPS/W reconfigurable hybrid-neural-network processor for deep learning applications." VLSI Circuits, 2017 Symposium on. IEEE, 2017, C26 - C27. DOI: 10.23919/VLSIC.2017.8008534

[10] S. Y. Yin., et al. "A High Energy Efficient Reconfigurable Hybrid Neural Network Processor for Deep Learning Applications." IEEE Journal of Solid-State Circuits 2018 53(4): 968-982. DOI: 10.1109/JSSC.2017.2778281

Artificial Neural Networks

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Introduction

The study of human brain is thousands of years old. The advent of modern electronics, it was only natural to try to harness this thinking process. The human brain processes information in a coordinated way with the old of a network of a very large number of interconnected, relative to simple decision-making elements, neurones. Neurones are massively connected, much more Complex and denser than telephone networks. Each neurone is interconnected to 10^3 to 10^4 neighbouring neurons. The total number of selecting interconnections where information is stored is extremely large, approaching 10^4 to 10^{15}.

There is a hierarchy of structure. The Nervous System with C3I (command, communication, control and information) stemming from the brain and converging to a cell.
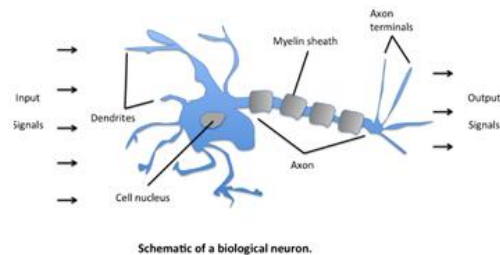
A single biological Neurone:

1. Synapses wait the individual parts of information: mixed signals from other neurons are cells are transferred to a neurone by special connections, synapses.
2. The Soma (cell nucleus) weight is accumulated.
3. Axon transfers outgoing pulses.
4. Dendrites collect all parts of information.

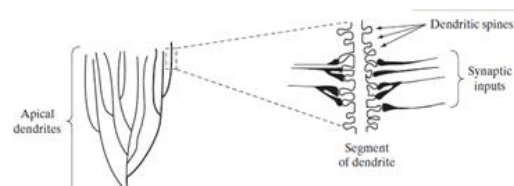## What is artificial neural network?

A Neural network is a machine that is designed to model the way in which brain performs a particular task or function of interest; Work is usually implemented by using electronic components are simulated in software on a digital computer.

"Neural network is massively parallel distributed processor made up of simple processing units that has a natural prospensity for storing experiential knowledge and making it available where use. it resembles the brain into two respects:

1. Knowledge is acquired by network from its environment through a learning process.
2. Interneuron connection strengths, known as indirect equates, are used to store the acquired knowledge."

Schematic of a biological neuron.

Training artificial neural network

Once a network has been structured for a particular application, that network is ready to be trained. to start this process the initial weights are chosen randomly. Then, the training, for learning, begins there are two approaches to training supervised and unsupervised. Supervised training was a mechanism of providing the network with the described output either by manually creating the networks performance or by providing the desired output with inputs. Unsupervised training is where the network has to make sense of the input without outside help. The vast bulk of networks utilize supervised training. Unsupervised training is used to perform some initial characterization on inputs. However, in the sense of being truly self learning, it is still just a shining promise that is not fully understood that does not complete your work and thus is relegated on the lab.

Supervised Learning

In supervised training, both the inputs and outputs are provided. The network then

processes the inputs and compares its resulting output against the desired output. Errors are then propagated back through the system, causing the system to adjust the way which control the network. This process occurs over and over as the waves continually treat the set of data with a labelled training is called "the training set". during the training of a network the same set of data is processed many times as the connection weights are ever refined. The correct commercial network development packages provide tools to monitor how well an artificial neural network is converging on the ability to predict the right answer. These tools allow the training process to go on for days, stopping only when the system reaches the some statistically desired point or accuracy. however, some networks level, learn from stopped this could be because the input data does not contain the specific information from which the desired output is derived. Networks also don't converge if there is not enough data to enable complete training. Ideally, there should be enough data to show that part data can be held as a test. Many layered networks with multiple nodes are capable of memorizing data. To monitor the network to determine if the system is simply memorizing its data in some non-significant way, supervisor learning needs to hold back a set of data to be used to test the system after it has undergone its Training. network simply can't solve the problem designer then has to review the input and outputs , the number of elements per layer, the connections between the layers information, transfer, and training functions, and even the initial weights themselves the changes required to create a successful network constitute a process in the art of neural networking occurs. Another part of the designer's creativity governs the rules of training. there are many laws used to implement the adaptive feedback required to adjust the weight during the training the nearest common technique its backward-error

propagation, would be known as back propagation.

Unsupervised or Adaptive Training

The other type of training is called unsupervised training. in unsupervised training the network is provided with inputs but not with desired output. system itself must then decide what features it will be used to group the input data which is often referred as self- organisation or attraction at the present time unsupervised learning is not well understood. this adaption to the environment is a promise which would enables science fiction types of robots to continually learn of them has the encounter news patients and new and life is in which situations with exact training set does not exist from of the situations involving military action when you come back techniques and new weapons my encounter. because of this unexpected as back to life and human desire to be prepared from of War continues to be research into, and hope for, please feel it coming at the present time of neural network work is system with supervised learning. supervised achievement results.

Conclusion

The computing world has a lot to gain from neural networks. Their ability to learn by example makes them very flexible and powerful. Furthermore, there is no need to derive an algorithm in order to perform a specific task; there is no need to understand the internal mechanism of that task. There are also very well suited for real time stems because of their fast phone and computational which architecture. Neural networks also contribute with other areas of research such as neurology and psychology used to model parts of living organism and to investigate the internal mechanism of the day for the most exciting aspect of neural networks is the possibility that some conscious network might be produced is a number of scientist for giving that consciousness is a mechanical property that conscious neural networks are realistic for equality.

IOT Based Intelligent Agriculture Field Monitoring System

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INTRODUCTION

According to Beecham's report entitled "Towards Smart Farming: Agriculture Embracing the IoT Vision" predicts that food production must have to increase by 70 percent in the year 2050 in order to meet our estimated world population of 9.6 billion people . Hence, it is very important to boost up the agricultural productivity to ensure high yield and farm profitability.

The major challenge in quality farming is unpredictable weather and environmental conditions such as rainfall, temperature, soil moisture etc. Moreover, humidity is one of the major environmental parameter in farming as it affects the turgor pressure of plants, which is an indicator of the amount of water in plant cells. When the amount of humidity in air is low, transpiration takes place very quickly in plants.

Further, due to high rate of transpiration, plants wilt rapidly as too much water is pulled out from plant cells.On the contrary, when amount of moisture in air as well as temperature is high, the rate of transpiration is reduced which in turn restricts evaporative cooling. In order to monitor these environmental conditions and action have been taken accordingly, continuous manual effort was required which is quite impractical and not possible all the times.

In this respect, IoT plays a significant role in implementing the concept of smart farming to automate the farming operations. IoT is new computing and communication paradigm in which the objects of everyday life have equipped with sensor, microcontroller and transceiver to sense the surrounding environmental parameters. In addition, communication of the sensed data with one another or user, becoming an integral part of Internet system. In IoT, every objects used in our daily life with unique identifier is connected with each other so that they can send data over the network without human intervention.

IoT is growing day by day as many more objects are going to be connected throughout the world. IoT can be used in many different domains such as precision agriculture , Smart grid , environmental monitoring etc. IoT technology is gaining popularity in agricultural field for its highly scalable, interoperable and pervasive nature.

To automate the farming operations, several environmental parameters those have impact on farming, are required to track down at different locations. The important environmental parameters include temperature, moisture, and water level. Different types of sensors are deployed over the field to monitor those environmental parameters related to farming and attached with microcontroller.

According to environmental condition, microcontroller controls different actuators or farming equipment (Pump, Fan etc.) without human intervention. Apart from that these sensed data can be stored in the cloud. Microcontroller attached with wi-fi module sends those sensed parameters to the cloud. Most wireless environment monitoring system uses GSM based and or CDMA/GPRS technology. But they have several disadvantages including high cost of network forming, low access rate etc. To be the part of internet, the objects have unique identifier. Internet Protocol version 6 (IPv6),

Internet Protocol version 4 (IPv4) is generally used as a unique identifier of the objects. The rest of the paper is organized as follows. Section II highlights related work on smart farming. Section III describes the proposed system design for IoT based smart farming. Section IV presents the experimental setup for implementing the proposed system and results.

SYSTEM DESIGN

Our main objective of this work is to design an IoT based smart farming to control high voltage electrical devices like pump, flap of playhouses etc. without human intervention depending on environmental parameters like soil moisture and temperature. These parameters are stored in cloud for future data analysis. Farming is done within playhouses for better controlled environment. The proposed system is consisting of different layer as represented in Fig. 1. It is divided into four modules: Sensor layer, Middleware, Communication Layer and Cloud & Application Layer.
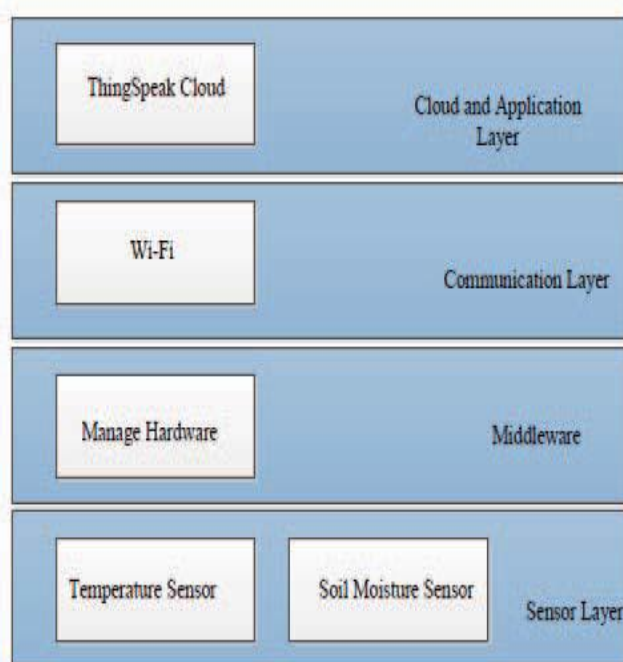

Fig. 1. Different layers of smart Farming System

A. Sensor Layer
This is the first layer of our proposed system. It is responsible for capturing and monitoring different environmental parameters. For sensing or collecting the parameters different kinds of sensors are deployed over the agriculture field. For this research work, two types of sensor have used: soil moisture sensor to monitor soil
humidity level and temperature sensor to observe temperature level within poly houses. These sensors are attached with Arduino based microcontroller. The
microcontroller attached with sensors formed basic IoT objects those are deployed over the agriculture field.

B. Middleware design
This is the second layer of our proposed system. The middleware is needed to automate the farming process and it controls the actuators. It is to be designed for
microcontroller. Sensed values are fed into the microcontroller and depending upon the threshold values of different parameters of monitoring field it acts accordingly. This layer carefully monitors temperature and soil moisture level as these two parameters directly affects the crop yield and following decisions are made.
Apart from controlling the actuators, microcontroller sends the sensed data to the ThingSpeak cloud from the field through a gateway.

C. Communication Layer

In this layer microcontroller communicates with the gateway wirelessly through Wi-Fi module as it gives advantage over Bluetooth. Bluetooth provides short range
communication than Wi-Fi as gateway may be far away from the monitoring field. Ethernet based communication is avoided due to huge cabling. Here, microcontroller is equipped with sensors deployed over monitoring field and sending the sensed soil moisture and temperature value to the cloud through a gateway. IP based protocol is running on the gateway. Microcontroller sends HTTP request to the ThingSpeak cloud for writing sensed value to the corresponding channel.

D. Cloud & Application layer

Cloud computing is an emerging technology and can be used effectively in smart farming. The proposed model uses the cloud computing platform for recording different agricultural field data. In this layer different channels are created, each corresponds to specific parameter field in the ThingSpeak cloud for storing field data (temperature, soil moisture). Microcontroller sends the sensed data to the respective channel periodically through communication protocol. These data (soil moisture value, temperature value) are plotted with respect to time and can be used for

future analysis. Agricultural field status (temperature, soil moisture) can be monitored remotely in terms of graph in ThingSpeak web service. Applications can be created

related to farming which is deployed in the cloud and can be used by farmers or researchers.

Soil Texture Soil Moisture Content (%)

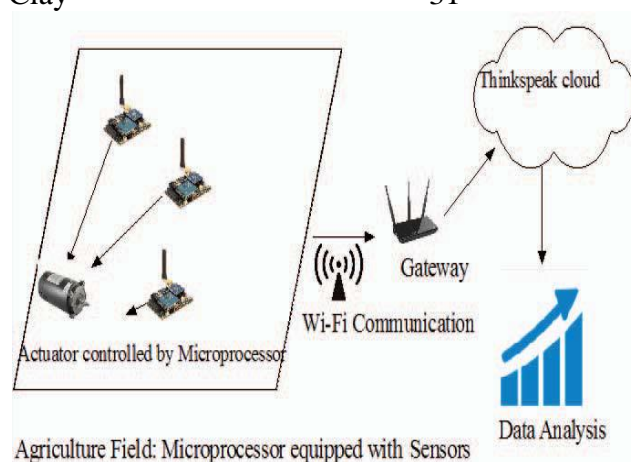| Sand	7
Loamy Sand	12
Sandy Loam	15
Silt Loam	20
Loam	23
Silty Clay Loam	28
Clay Loam	27
Sandy Clay Loam	24
Sandy Clay	22
Silty Clay	30
Clay	31

Fig2: System deployment model

REFERENCES

[1] Ashton, K. (2009). That internet of things thing in the real world, things matter more than ideas. RFID Journal. Retrieved from http://www. rfidjournal. com/article/articleview/4986/1/82.

[2] Barroso, L. A., Dean, J., and Holzle, U. (2003). Web search for a planet: The google cluster architecture. Micro, Ieee, 23(2):22–28.

[3] Crespy, D. and Rossi, R. M. (2007). Temperature- responsive polymers with lcst in the physiological range and their applications in textiles. Polymer International, 56(12):1461–1468.

[4] Karimi, K. and Atkinson, G. (2013). What the Internet of Things (IoT) Needs to Become a Reality. . Technical report, Freescale.

[5] Nakamoto, S. (2008). Bitcoin: A peer-to-peer electronic cash system. Consulted, 1:2012.

[6] Nji, J. and Li, G. (2010). A self-healing 3d woven fab- ric reinforced shape memory polymer composite for impact mitigation. Smart Materials and Structures, 19(3):035007.

[7] Shim, B. S., Chen, W., Doty, C., Xu, C., and Kotov, N. A. (2008). Smart electronic yarns and wearable fab- rics for human biomonitoring made by carbon nan- otube coating with polyelectrolytes. Nano letters, 8(12):4151–4157.

Helping the Blind See with Their Tongues

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INTRODUCTION

What if we told you there are new innovations that can help about 285 million people around the world living with a visual impairment move around with a little more ease? Okay, it's easy enough to believe, but what if we told you the innovation works by using the surface of their tongues? Now here's something that should be celebrated: there's an increasing number of sensory-substitution devices being developed that use the brain in the most remarkable way. These devices take in visual information from the environment and translate it into forms of physical touch or sound in order to be interpreted by the user as vision.

The device, called the BrainPort V100, can help the blind navigate by processing visual information and communicating it to the user through electrodes on his tongue. Though this isn't the first device to go on the market using sensory substitution (where information perceived by one sense is communicated through another), the sophistication and usability of the BrainPort V100 could mean that the number of sensory substitution devices permitted by the FDA is on the rise.

About It

The BrainPort V100 consists of a pair of dark glasses and tongue-stimulating electrodes connected to a handheld battery-operated device. When cameras in the glasses pick up visual stimuli, software converts the information to electrical pulses sent as vibrations to be felt on the user's tongue. Like most sensory substitution devices, "seeing" with your tongue may not be intuitive at first. But the researchers who developed the device tested it over the course of a year, training users to interpret the vibrations. Studies showed that 69 percent of the test subjects were able to identify an object using the BrainPort device after a year of training. However, the device is expensive; Wicab told *Popular Science* that it will cost $10,000 per unit, the same as its price when first reported back in 2009.

Researchers have been fiddling withsensory substitution for a long time, but most of these devices are not yet widely available. The BrainPort V100 will be on one of the first, having passed the FDA's review through recently-updated guidelines called the premarket

review pathway: "a regulatory pathway for some low- to moderate-risk medical devices that are not substantially equivalent to an already legally-marketed device," according to the press release. Since this device is now allowed to be marketed and was approved relatively quickly through these new guidelines, the BrainPort may be paving the way for an explosion of sensory substitution devices to hit the market in the next few years, which could help the growing numbers of Americans with sensory impairments.

Experience

A decade ago, Weihenmayer(a blind man) began using the BrainPort, a device that enables him to "see" the rock face using his tongue. The BrainPort consists of two parts: the band on his brow supports a tiny video camera; connected to this by a cable is a postage-stamp-size white plastic lollipop, which he holds in his mouth. The camera feed is reduced in resolution to a grid of four hundred gray-scale pixels, transmitted to his tongue via a corresponding grid of four hundred tiny electrodes on the lollipop. Dark pixels provide a strong shock; lighter pixels merely tingle. The resulting vision is a sensation that Weihenmayer describes as "pictures being painted with tiny bubbles."

The BrainPort, which uses the sense of touch as a substitute for sight, is one of a growing number of so-called sensory-substitution devices. Another, the vOICe, turns visual information into sound. Others translate auditory information into tactile sensation for the deaf or use sounds to supply missing haptic information for burn victims and leprosy patients. While these devices were designed with the goal of restoring lost sensation, in the past decade they have begun to revise our understanding of brain organization and development. The idea that underlies sensory substitution is a radical one: that the brain is capable of processing perceptual information in much the same way, no matter which organ delivers it. As the BrainPort's inventor, the neuroscientist Paul Bach-y-Rita put it, "You don't see with the eyes. You see with the brain."

About the creator

Bach-y-Rita, who died in 2006, is known as "the father of sensory substitution," although, as he liked to point out, both Braille and white canes are essentially sensory-substitution systems, replacing information that is typically visual—words on a page, objects at a distance—with tactile sensation. He even argued that writing ought to be considered the original precursor, because it enabled the previously auditory experience of the spoken word to be presented visually.

Bach-y-Rita had already begun tinkering with devices that substituted tactile sensation for vision, but, encouraged by this personal evidence of the brain's ability to adapt to loss, he completed his first prototype in 1969. It was built from castoffs—a discarded dentist's chair, an old TV camera—and weighed four hundred pounds. A blind person could sit in the chair and scan the scene by using hand cranks to move the camera. The analog video stream was fed into an enormous computer, which converted it into four hundred gray-scale dots. These points of information were then transferred not to four hundred electrodes, as in the BrainPort, but to a grid of vibrating, Teflon-tipped pins mounted on the back of the chair. The pins vibrated intensely for dark pixels and stayed still for light ones, enabling users to feel the picture pulsing on their backs. After just a few hours' practice, Bach-y-Rita's first six volunteers, all blind from birth, could distinguish between straight lines and curved ones, identify a telephone and a coffee mug, and even recognize a picture of the supermodel Twiggy.

In 1998, Bach-y-Rita founded a company, Wicab, to commercialize his invention. It is based in a small office park in the suburbs of Madison, Wisconsin, and shares an anonymous, two-story glass building and a plant-filled atrium with a family dentist. A couple of dozen employees sit at cubicles or in a small workshop where each of the devices is still built by hand. When I visited, Tricia Grant, Wicab's director of clinical research, led me through the first steps of a ten-hour training program that she's developed to help new users get accustomed to the device.

Conclusion

"Many people who have acquired blindness are desperate to get their vision back," Nau says. Although sensory substitution techniques cannot fully restore sight, they do provide the information necessary for spatial orientation. Along with the blind, the BrainPort could help people with visual defects such as glaucoma, which leads to the loss of peripheral vision, and macular degeneration, which degrades sight at the center of the visual field.

Technology, at its core, is developed to add something to our lives; to break down our barriers, provide ease, increase efficiency, and shine light into the dark spaces.

References

[1] "Visual Impairment and Blindness." World Health Organization. World Health Organization, Aug. 2014. Web. 13 Sept. 2017.
[2] "Seeing with Your Tongue." The New Yorker. The New Yorker, 15 May 2017.
[3] "Tasting Sight." Vimeo. Paul Hairston, Nov. 2016.
[4] "Acres." Untold Tech | Acres. Acres New York, n.d.
[5] "Brainport Vision Device." YouTube. Touchthetop, 03 Mar. 2009.
[6] "Seeing with Your Tongue." The New Yorker. The New Yorker, 15 May 2017.
[7] "Blind Learn To See With Tongue." YouTube. CBS, 19 Jan. 2007.

Did You Know?

1. Amazon is not an online retailer -- it is a tech company.
In creating the infrastructure needed to run its services, Amazon discovered they had a good thing going and started offering Amazon Web Services (AWS) as an IT infrastructure service to other businesses. Today, one in four companies run on AWS (including Snap chat, Netflix, Adobe and NASA, just to name a few) and one in three website users will visit an AWS website every day. Amazon controls hundreds of thousands of servers operating in 42 "availability zones" in 16 geographic regions around the world, and the company is adding enough new servers every single day to have managed all of Amazon when it was a seven billion dollar business.

2. Ever wonder what those things called cookies are?
They're not virtual baked goods, but instead are a way that websites can monitor website usage on your computer. It helps websites decide what ads to display, or helps remember your username for an easier log-in next visit. Even though cookies tell websites certain things about your browsing habits, they don't actually track it back to your personal name. They track it to your IP address, which is like your computer's birth name. Only in <u>severe legal cases</u> or if you're using a work computer, can this be tracked back to you.

3. Have you ever spent valuable time reading your way through a thorough and lengthy article, only to accidentally close out of it?
No worries, just press Ctrl + SHIFT + T and you will get it back. This trick works in most internet browsers and can not only save you time, but also might save your computer from the ensuing rage of losing those precious minutes of research.

4. Russia built a computer that ran on water: in 1936
Vladimir Lukyanov built something like this in 1936 but he used water to create a computer that solved partial differential equations. In images of the Lukyanov computer, you'll see a complex system of Inter connected tubes filled with water.
Adjusting taps and plugs altered the flow of water (and changed variables) while the end result was seen by measuring the level of water in certain tubes. It was also called a Water Integrator and was originally designed to solve the problem ofcracking in concrete. It's now found in Moscow's Polytechnic Museum.

5. Apple Watch saves man's life after warning him of heart problems
Apple launched the Series 4 Apple Watch in September 2018, and the watch has significant improvements over its predecessors. One of the most noteworthy features is the improvement in the heart rate sensor, which informed the wearer regarding any spikes or drops in the heart rate, even if the user doesn't feel any symptoms

6. Smart devices can spot signs of dementia
A study suggest that Apple Inc devices, in combination with digital apps, could differentiate people with mild Alzheimer's disease dementia and those without symptoms.

TRICKY CORNER!

1. Bag of Coins

You have 10 bags full of coins. In each bag are infinite coins. But one bag is full of forgeries, and you can't remember which one. But you do know that a genuine coins weigh 1 gram, but forgeries weigh 1.1 grams. with a digital weighing machine.

ANSWER: 1 reading.

Take 1 coin from the first bag, 2 coins from the second bag, 3 coins from the third bag and so on. Eventually, we'll get 55 (1+2+3…+9+10) coins. Now, weigh all the 55 coins together. Depending on the resulting weighing machine reading, you can find which bag has the forged coins such that if the reading ends with 0.4 then it is the 4th bag, if it ends with 0.7 then it is the 7th bag and so on.

2. Sand Timers

You have two sand timers, which can show 4 minutes and 7 minutes respectively. Use both the sand timers(at a time or one after other or any other combination) and measure a time of 9 minutes.

ANSWER: 9

Start the 7 minute sand timer and the 4 minute sand timer.

Once the 4 minute sand timer ends turn it upside down instantly.

Once the 7 minute sand timer ends turn it upside down instantly.

After the 4 minute sand timer ends turn the 7 minute sand timer upside down(it has now minute of sand in it)

So effectively 8 + 1 = 9.

3. The toss of a coin

You toss two coins. If you get heads with the first coin, you stop. If you get tails, you toss it again. The second coin is tossed regardless. What is the ratio of heads to tails?

ANSWER: 1 : 1

You would expect the odds of heads or tails to be 50/50 for any tossed coin. You would then expect to toss the first coin at least twice. This should, by rights, give you a ratio of 1 to 1. The second coin is continuously tossed and it should also have a ratio of 1 to 1. Hence the ratio of the two must, therefore, also be 1 to 1.

FUN ZONE!

1. Einstein ,Newton and Pascal are palying hide and go seek. It's Einstein's turn to count so he covers his eyes and starts counting to 10. Pascal runs off and hides. Newton draws one meter by one meter square on the ground in front of Einstein and stands in middle of it. Einstein reaches ten and uncovers his eyes. He sees Newton immediately and exclaims "Newton ! I found you! You're it!"
Newton smiles and says " you didn't find me, you found a Newton over a square meter. You found pascal!"

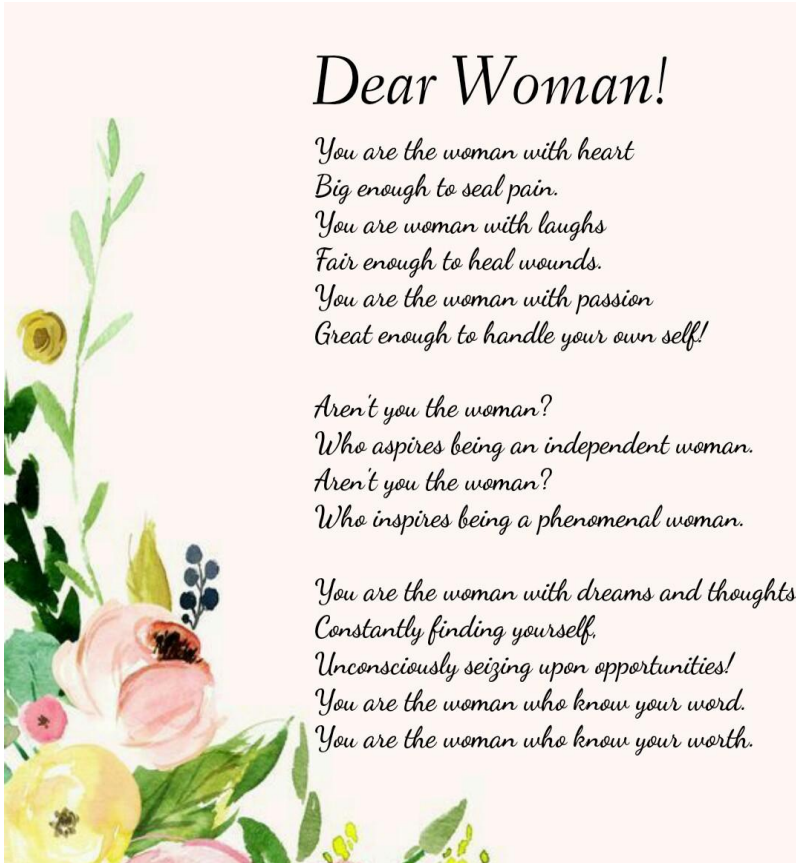2. Did you ever come to this state of finding such keys

3. A software engineer was smoking…
A lady standing nearby asked him,
Can't you see the Warning?? Smoking is Injurious to health!
He replied, "we are bothered only about Errors not warnings"

Hello Poetry!

by K Sai Himaja (17JG1A0561)

Dear Woman!

Dear Woman!

You are the woman with heart
Big enough to seal pain.
You are woman with laughs
Fair enough to heal wounds.
You are the woman with passion
Great enough to handle your own self!

Aren't you the woman?
Who aspires being an independent woman.
Aren't you the woman?
Who inspires being a phenomenal woman.

You are the woman with dreams and thoughts
Constantly finding yourself,
Unconsciously seizing upon opportunities!
You are the woman who know your word.
You are the woman who know your worth.

Ode of reveren

To crown it all..
The wounds are not discussed
The burns are not bothered.

They cared for the land,
They served for the countrymen.

They love and been loved by someone
but they shouldn't be seen by anyone.

They stayed awake in the noisy night
bearing the weight of weapons and uniform.
They fought for every countrymen's goodnight wish.

We lost the one who salutes the flag with emotion.
We lost the one who serves beneath the flag with dedication.

@my_words.my_chords

CONTRIBUTIONS & ACHIEVEMENTS

Coding

Many of the students of GVPCEW had participated and came through with flying colours in several technical competitions.

Some of them are –

V.R Haritha --Secured first prize in code jumbling eventunder MAESTROWEAVE in National Level Symposium EKATHRA

Ramya --Secured 1st in code coliseum event under IIT Mumbai in CreSence 2018 held at jntu(v)

P.Bharathi --Secured first prize for showing excellence in technical project submission organized by ExpertshubIndustry skill development center at Hyderabad.

K.Hima Bindu-- Secured first prize in Reverse Coding Event underMAESTROWEAVE National Level Symposium EKATRA.

Sports

Shiva Jyothi-- Selected as university standby player for table tennis. Secured 4th place in table tennis at jntuk women inter college tournaments.
Sneha -- Secured 4th place in table tennis at jntuk women collegiate tournaments.

Quiz

P.Indira – Secured 1st prize in quiz in maths club and 2nd prize in puzzle solving in Maths club.
V.Meghana – Secured 1stmaths quiz competition.

Placements

placement Statistics:
1.TCS -55   2.Wipro -8
3.ADP -2   4.Continental CG -1
5.HSBC -3   6.Infosys-6
7.Hansa Solutions -2   8.Verizon -2

DEPARTMENT ACTIVITIES

Activities conducted during the year 2017

S no	Date	Activity Name	Faculty Coordinator	Participants
1	09-01-17, 10-01-17	A Workshop on "**Internet of Things** "by Mr CHVVD Prasad, Mr K P Naidu.	Mr S Sumahasan Ms M Deepthi	III B Tech
2	21-01-17	A Guest lecture on "**Orientation on R-Programming**" by Prof. Dr. N. B. Venkateswarlu, GVPCEW.	Mrs. K. Rohini	II B.Tech
3	25-01-17	A Expert talk on "**CAREER OPPORTUNITIES**" by Sri Shashidhar Reddy, Infosys	Mr.CHVVD PRASAD, Mrs.K.Rohini	CSI MEMBERS
4	25-02-17	A Guest lecture on "**Concept of Pushdown Automata**" by Mr. Suresh Nannuri (Ph.D.), assoc. Professor, dept of CSE, QIS College of Engineering & Technology, Vegamukkapalem, Ongole, Prakasam DT, A.P-523272.	Mr. V. Lakshmana Rao	III B.Tech
5	17-06-17, 15-07-17	A Two-day workshop on "Python Programming" by Ms V A Gowthami, Ms D Indu, Ms M Deepthi	Mrs. M Swapna Ms. B V Lakshmi	II B.Tech
6	17-06-17, 24-06-17, 15-07-17, 22-07-17	A Four-day workshop on " BIG Data " by Ms. P Sridevi, Mr. K P Naidu, Ms. B V Lakshmi, Mr. CHVVD Prasad	Mrs. B. Vijaya Lakshmi, Mr. B.LVV Kumar	II B.Tech
7	18-7-17	An Industry Expert Talk on "Working Environment in IT Industry" by Mr. Suresh Raju, Vizag Operations, PamTen Inc.	Mrs. P. Sridevi	III B.Tech
8	01-09-17	An Industry Expert Talk on "Experiences Sharing & Some Suggestions" by Mr. Anuradha S Dasu, vice President, Polaris.	Mr. Ch.V.V.D Prasad	III B.Tech
9	06-09-2017	An Experts talk on "Latest Trends in Information Technology" by Prof. Dr. M.L Sai Kumar.	Mr.M.Santosh, Mrs.K.Suneetha, Mr.K.Nagaraju	CSI MEMBERS
10	08-12-17	A Guest lecture on "The Dawn of new Saga in Machine Learning" by Dr. M.N Murthy, Professor, IISE, Bangalore.	Mrs. Swapna	III B.Tech
11	16-12-17	An Industry Expert Talk on "Recent Trends on IT Prospects" by Mr. G. Naga Venkata Suresh, Consultant, AIM Deloitte, Hyd.	Mr. B.L.V Vinay Kumar	III B.Tech
12	26-12-17 28-12-17	A three-day workshop on "BIG DATA" by Mr. G. Suresh.	Mr.M.Santosh, Mrs.K.Suneetha, Mr.K.Nagaraju	CSI MEMBERS

TOP UNIVERSITIES

- Massachusetts Institute of Technology
- Stanford University
- Carnegie Mellon University
- Harvard University
- The University of California, Berkeley (UCB)
- Princeton University

TOP JOB SEEKERS WEBSITES

- Indeed
- Vacancyopen
- Monster
- Naukri
- TimesJobs
- Fresherworld

TOP CODING IMPROVEMENT WEBSITES

- Codecademy
- Code Avengers
- Udacity
- Khan Academy
- Coursera
- TopCoder
- Coderbyte
- Project Euler
- HackerRank
- CodeChef