



THE NEWTON'S APPLE

January 2018

Preface

Hello Reader!

Welcome to the first edition of Newton's apple this year. This edition, we provide you a sneak peek into the happenings in and around the college. So readers get ready for another exciting journey with the Newton's apple!

Any suggestions to improve the value of this magazine will be gratefully received and will be incorporated in the subsequent editions.

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FLYING MOTORCYCLES (HOVER BIKES)

A Hover bike is a vehicle that can float. It otherwise resembles a motorbike.

WHAT IS IT ACTUALLY?

It is surely not a motorcycle. It is rather a prototype of a platform, which has a multifaceted future.

It mainly consists propulsive portions - one in front of and one behind the driver. It is a combination of a motorcycle and a helicopter. Ideally, such a vehicle would be able to allow people to navigate the earth in a new and unique way. Hover Bike project is a flying motorized machine. It will look a lot like a chopper. It has thrusters to hover, but it will also be able to have wheels if required. We can use the chopper as the basis for Hover Bike. Current motorcycles have two wheels. Hover Bike will change that because it will have thrusters to hover, but it will also be able to change back to having tires. They can move quickly over the ground and their hovering ability allows them to climb some walls.



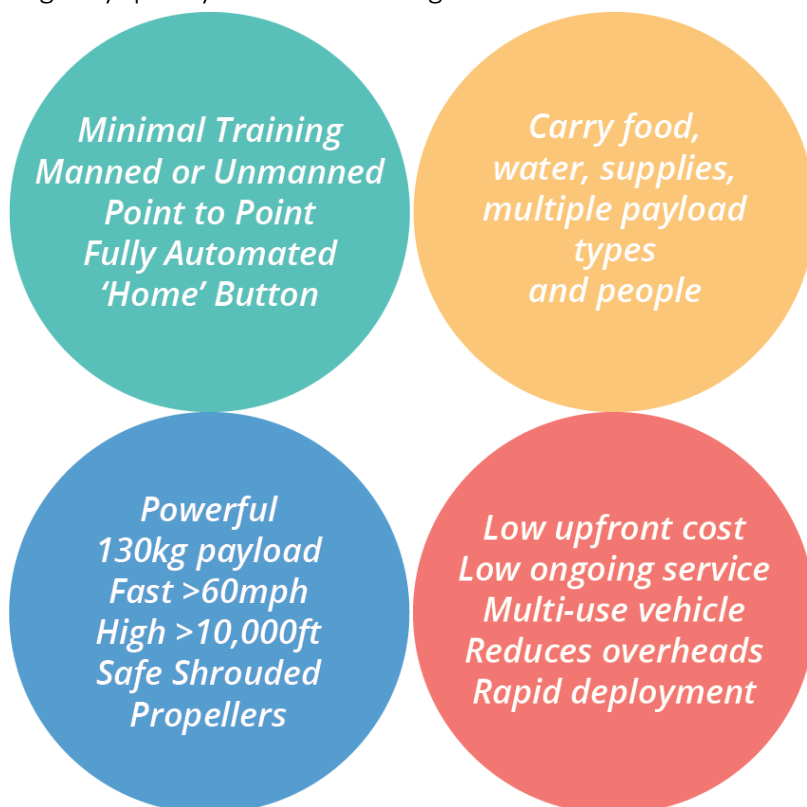
Hover bikes have different controls:

- The **Left** and **Right** inputs (usually assigned to A and D) make the Hover bike accelerate toward the left and right sides of the screen, respectively.
- The **Up** input (usually assigned to W) causes the Hover bike to raise its nose, while the **Down** input (usually assigned to S) causes the Hover bike to lower its nose.
- The **Jump** input (usually assigned to Space) causes the Hover bike to "jump" upward by sending an impulse to its thrusters.
- The **Primary Fire** input (usually the Left Mouse Button) toggles the headlights, and the **Alt Fire** input (usually the Right Mouse Button) engages the Hover bike's horn.

While in use, hover bikes will do their best to hover 3 miles above the ground (this tendency is why they can climb walls and even some shallow overhangs). They can move horizontally at up to 80 miles per second (the player's default run speed is 14 miles per second). These vehicles ignore platforms, a property also possessed by the spike sphere.

When a Hover bike hits an object at low speeds, a sound will be made, but the Hover bike will not take damage. If, instead, it hits something at higher speeds, such as those

attained from a long fall, a crunching sound will be heard and the Hover bike will take ten defence-ignoring damage. In the case of a long fall, the riders may take fall damage if the hover bike is falling very quickly when it hits the ground.



DESIGNING:

Electronic speed controller (ESC): An ESC is an electronic circuit with the purpose to vary electronic motor speed. The throttle of each ESC is controlled by a separate channel and has a gyro between the receiver and ESC.



Universal Battery Eliminating Circuit: A “Universal Battery Elimination Circuit” is an external electronic circuit that taps power from motor’s battery and regulates the voltage down to the necessary 5 or 6 volts for the receiver and servos.

Control System: Circuit Board Kk2 is circuit board is used to control the each motor and complete model. This is also use to tune the flying of the model. This is the main part of the model.

Current developments:

Aero X runs pretty similar to a bike and can carry two people. It hovers up to 12 feet (roughly over 3 meters) from the ground owing to its rotary engine driving the carbon fibre blades for the necessary lift. The craft registers a maximum speed of 72 km/h (45mph), which is pretty impressive. With a pre-fuel weight of 785lb, this Hover bike can handle an additional 310lb weight over any kind of surface, claims the company. On a full tank, the bike's expected to run smoothly for 75 minutes. While its main functionality shall be of a low-altitude SUV, the developers state that the bike could be adapted for several potential uses. Mark De Roche, Founder/CTO Aero fex states that the Aero-X will have a positive impact on agriculture, herd management, and geo-surveying particularly in those parts of the world lacking general aviation. Its intuitive operation, low cost, and unique capabilities make it suitable for disaster relief, search and rescue, and patrolling borders and game parks. We believe it will enable low-altitude utility previously unavailable due to cost and training barriers.

Advantages and Disadvantages

- The most obvious advantage of Hover bike is its low cost, because it is significantly cheaper to purchase, fuel, and maintain than regular air planes.
- It is significantly easier and faster to deploy.
- It can perform precise, repetitive and hard tasks and can also fly in hostile conditions.
- It is smaller and can fly lower than traditional airplanes, therefore reducing the risk to military hardware.

Applications

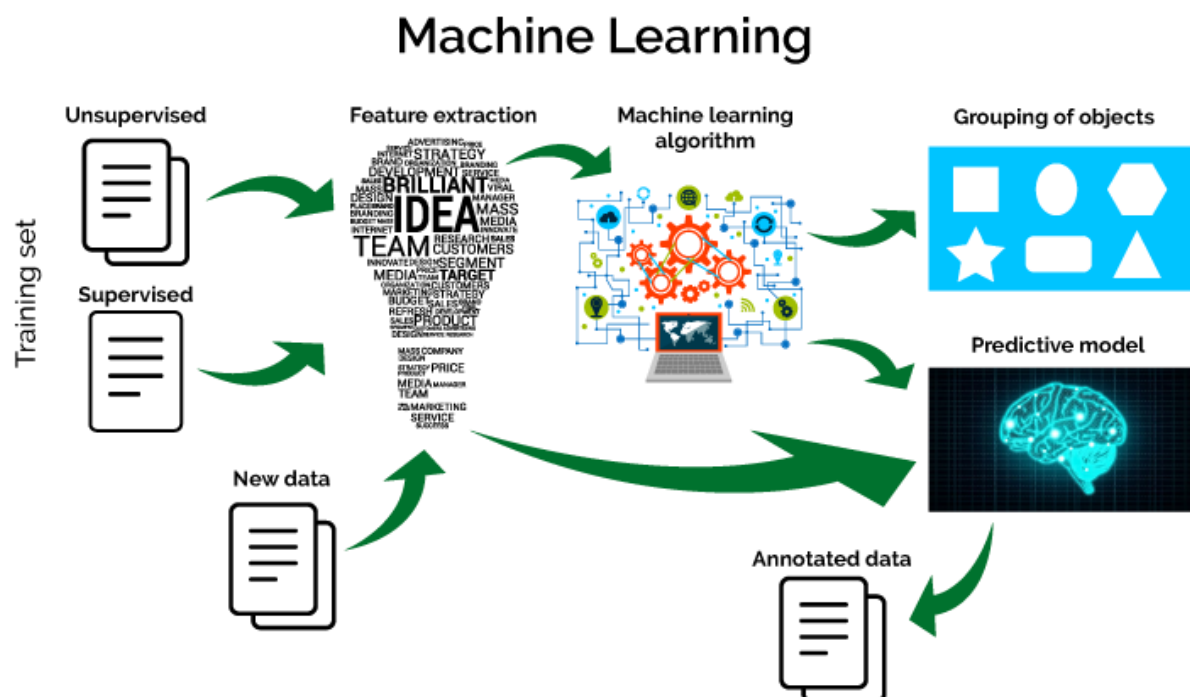
- Used in policing duties
- Can be used Traffic spotting
- Sports events film coverage
- Aerial photography
- Surveillance of coastal borders, road traffic, etc.
- Disaster and crisis management search and rescue.
- Environmental monitoring.
- It has the ability to carry supplies if extraction is impossible.
- The full scaled model could be used as a future mode of transportation.

By: - Anusha 3/4 ECE A
Sushmitha 3/4 ECE A

Machine Learning

Machine Learning is a branch of artificial intelligence based on the idea that machines should be able to learn and adapt through experience without being explicitly programmed. Researchers interested in artificial intelligence wanted to see if computers could learn from data. The iterative aspect of machine learning is important because as models are exposed to new data, they are able to independently adapt. They learn from previous computations to produce reliable, repeatable decisions and results.

Machine learning focuses on the development of computer programs, made of many algorithms-basic and advanced, that can access data and use it to learn.



Some of the machine learning techniques includes:

- Supervised learning algorithms are trained using labeled examples, such as an input where the desired output is known. The learning algorithm receives a set of inputs along with the corresponding correct outputs, and the algorithm learns by comparing its actual output with correct outputs to find errors. It then modifies the model accordingly.
- Unsupervised learning algorithms are used when the information used to train is neither classified nor labeled. Unsupervised learning studies how systems can infer a function to describe a hidden structure from unlabeled data. The system doesn't figure out the right output, but it explores the data and can draw inferences from datasets to describe hidden structures from unlabeled data.

- Semi supervised learning is used for the same applications as supervised learning. But it uses both labeled and unlabeled data for training. This type of learning can be used with methods such as classification, regression and prediction.
- Reinforcement learning is often used for robotics, gaming and navigation. Algorithms interact with its environment by producing actions and discover errors or rewards. Trial and error search and delayed reward are the most relevant characteristics of reinforcement learning.

There are many algorithms in machine learning. Some of them are: Neural networks, Decision trees, Random forests, Associations and sequence discovery, Gradient boosting and bagging, Support vector machines, Nearest-neighbor mapping, k-means clustering, Self-organizing maps, genetic algorithms, Expectation maximization, Multivariate adaptive regression splines, Bayesian networks, Kernel density estimation, Principal component analysis, Singular value decomposition, Gaussian mixture models, Sequential covering rule building.



Industries like health care, financial services, marketing and sales, transportation etc. that work with large amounts of data glean insights from this data and are able to work more efficiently or gain an advantage over competitors. Self-driving Google car, online recommendation offers such as those from Amazon and Netflix, Fraud detection are some of the applications of machine learning. Machine learning can also be applied to the Internet of Things.

By: Mahitha.P
ECE-B 3/4

BITS-ATMOS 2K17

ATMOS is a techno-management fest organized by Birla Institute of Technology and Sciences. In the year 2017, it was organized on three days from October 27th to October 29th in the Hyderabad campus. We attended this fest. In this fest, the first-year students of BITS were engaged in making registrations, distributing certificates and volunteered in helpdesk, informing about the events while the second-year and third-year students of BITS organized the technical and non-technical events.

DAY1:

In the first day of the fest, the events like Reverse coding, ATMOS CODEJAM started wherein participants were asked to solve the programming questions in any language of their choice like C, C++ and Java. These questions are from the online coding platforms like Hacker Rank.

Also, we had video conference interactive session with the present ISRO chairman, A S Kiran Kumar. In this, we had an opportunity to ask questions to which the chairman answered. The event COURTROOM also took place on that day wherein participants were given a task and they should debate on that with the other group.

Workshops also started on this day. These were two-day workshops that took place. In this way, the first day ended with some other events like SUITUP and CODEGULF and DJ night. We were given accommodation on the campus.

DAY2:

Day 2 saw the onset of most of the main technical events like Law Follower, Bomb Squad, Gesture controlled robot, TechExpo, Enigma, Drone Challenge etc. and the PYBITS international conference started on this day.

We participated in all these events. Students from other states also participated in these events. In the evening, the events like MINIGP, ROBOWARS took place. These used advanced robots. In this way, the second day ended with more of technical stuff.

DAY3:

In this day, the final rounds for all the events took place. We observed that winners of these events were the one who worked on a specific task for a longer time making it more efficient.

Also on the third day, there was an interactive session with Jaya Prakash Narayana (former IAS and MLA), Jayesh Ranjan (Present IT secretary to the Government of Telangana) and the founders of various companies. In this way, the third day ended. Overall, it is a wonderful experience for us to be a part of the fest. We learnt many things.

By: Srikar Chintha 3/4 ECE A

TOUCH AND AUGMENTED REALITY WORKSHOP

BITS-ATMOS

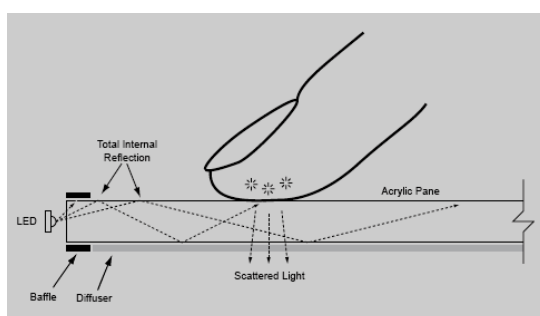


Atmos is the most awaited fest of the year. It is conducted at Birla Institute of Technology, Hyderabad yearly since 2012. In this fest, students from different colleges come together to explore various aspects of the engineering streams and their growing technologies. There are many events and workshops conducted wherein students showcase their talent and also learn something novel.

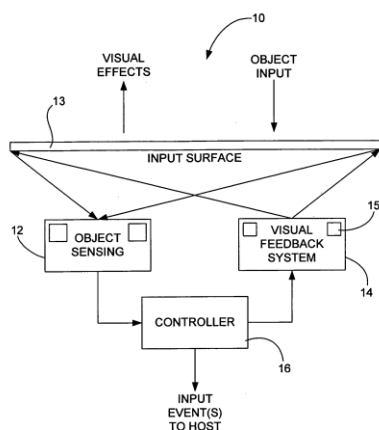
Now, I would like to give an overview of an exciting experience at the workshop – “Touch and Augmented Reality” conducted between 27th and 28th of October, 2017.

This workshop gives you a sneak-peak of touchpad, their creation and development. Well, could you just imagine of how it would be if your boring laptop or tv screen would get converted into a touch screen, what if it could play your favourite music with the gesture of your hands? All of this sounds interesting, right? But behind every exciting thing, there are numerous technologies, libraries, platforms etc. involved. I would like to brief you about a few technologies used in here:

1. FTIR(Frustrated Total Internal Reflection): It is generally used for multi-touch display. In this, the inside of a piece of acrylic is flooded with the IR light by trapping the light rays within the acrylic using the principle of total internal reflection.



2. Rear Illumination: It is a technique of using light source to illuminate translucent image from behind. It is also called as “Back-lighting.” It is done with the help of a frame that has rigging points for lighting and allow the translucent graphics to be applied on the face.
3. LLP(Laser Light Plane): In this, IR light from single or multiple lasers shine just above the surface. The laser plane of light is about 1mm thick and positioned as close as possible to the touch surface. When a finger or object hits the light plane, the object lights up and is seen by an IR camera below the surface. An image is then displayed using a projector connected to a computer pointed towards the projector material.
4. DSI (Diffused Surface Illumination): It is similar to FTIR. In this, the IR light is placed at the edges of an acrylic panel directed towards the inside. A special acrylics used to evenly distribute the IR light. When a finger or object touches the diffuser, it lights up from the IR light escaping from within and is seen by a camera below the surface. An image is displayed using a projector connected to a computer.



Similarly, we have many technologies coming up to feel the essence of multi-touch.

Let's see how to create our own touchpad!

Making touchpad:

All you need is a photo frame (plexiglass or acrylic), webcam, white light, cardboard box (one side open), A4 sheet. Place the cardboard box with its open side facing the top.

Inside it, webcam is positioned at the centre of the box and then, place the photo frame upon its open side and cover it with an A4 sheet. Then, illuminate the surface of photo frame covered with the A4 sheet with the help of a white light. Now, connect your webcam to the laptop with the help of a cable. Then, write a program in c++ or java or any high level programming language to track the position of fingers to zoom, drag etc. After this, execute your program and observe the webcam that shows how a simple photo frame now works as a touch screen when you place your fingers on it!

Apart from these, we also learnt about many interesting things that rule the market today.

Fiducial Markers: Playing music with a paper is a reality now! Fiducial Markers when placed in front of your laptop's or phone's camera, start playing the music instantly. It is as simple as that.

Kinect: It is a motion sensing service by Microsoft for the Xbox 360 video game console and window PCs.

How to use it?

Connect it to your PC with the help of a cable. After connecting, when you stand in front of Kinect, it recognises you, i.e., skeletal tracking, face, voice and gesture recognitions are done. Your job is to login into your favourite game, brace yourself up and smash it all out.

In this 2-day workshop at BITS-Atmos, we got an overall idea of how Touch and Augmented Reality is executed and brought into practice in our daily lives. On the whole, Atmos was an excellent experience as we were exposed to the pragmatic nature of work.

So, I think we must keep attending workshops and events not only at our college but also in other colleges as it helps widen the dimensions of our thinking and work as well as it imparts abundant knowledge to us.

By: Ayesha 3/4 ECE A

INSPIRE AND IGNITE

One of the major contributions to Acumen every year by the department of ECE is organizing a program called "Inspire and Ignite". The main motto of the program is to give proper career guidance to higher class school students and help them choose a career building path based on their interest.

We create awareness among the students regarding the different opportunities they have after schooling to make their future bright. We also introduce basics of electronics engineering to them which may ignite an engineer in them and inspire them to do wonders in the field of electronics.

School students are invited to our college for the technical fest (Acumen). Prior to that, basic projects related to electronics are explained to them and then we ask them to implement these projects which would create interest in them to learn more about it. Students are given an opportunity to exhibit their implemented projects in the college during the fest.

These students learn a lot many things by attending the fest which includes concepts like project expo, technical expo, poster presentations, paper presentations, technical and non-technical events. We let them know the uses and working principle of the instruments or devices that are used in a laboratory.

Inspire and ignite program in Vasavi gives a glance of engineering life to upcoming building blocks of our country. According to the internet, prior planning of career makes tasks easier and helps in attaining goals. Hope the implementation of Inspire and ignite program is very helpful in building their career.

By: Nirmala 3/4 ECE A
Navya 3/4 ECE A

RELAY RACE

NA Events 2017

Newton's apple was back with another interesting and fun loaded event "RELAY RACE". It was a team event of 4, which had juniors and seniors.

Motto:

Our main motto was to break the barrier among juniors and seniors, to trigger their interaction, to improve their team building skills, to make them expressive, to upskill their logical ability which is really important in this corporate world and last but not the least a break from the hectic schedule and we were successful in achieving them.

A brief description of the event

Stage-1:

Two of them solved the puzzle (colour of the chit was known after solving it).

Stage-2:

Another person was blindfolded, the team guided him to pick the right coloured chit and to reach the 4th person, 3rd person removed his blindfold and joined the rest of the team.

Stage-3:

The 4th person enacted the word from chit to his team. The time limit was 3 mins.

The **dates** of the event were

30th Oct - 2/4 (A), 3/4(B)&4/4

31st Oct - 2/4(B),3/4(A)&4/4

But due to the high response from the students, we continued to conduct it on the 1st of November also.

Venue:

3rd floor seminar hall

The entry fees: ₹20/- per team of 4.

The total number of participants :81

As all our events will have winners, this time our winners are:

Winners:

Aditya -3/4-A

Druva-3/4-A

Sahaja-4/4-B

Nandhini-4/4-B

Time: 1:19 seconds

Cash prize: ₹200/-

1st runner-up:

Surya Teja-3/4-A

Rakesh-3/4-A

Rahul-2/4-B

Prashanth-2/4-B

Time: 1:23 seconds

Cash prize: ₹100/-

Organised By:

4th years:

Vishnu

Nandhini

Ganesh

Prathyusha

Nikhil

Sahaja

Naveen

Rishitha

Kusuma

Anitha

Divya

Gowthami

3rd years:

Chandra Vamshi

Fouzia

Navya

Susritha

Sruthi

Please do find the pictures of the event from the link given below. Sorry for the inconvenience.

<https://drive.google.com/open?id=1awHXkXx3kKlonm8kAZLh0FXWYll69R5e>

PINKY PROMISE?

“Alright! We’ll have our quiz now. Fifteen minutes. Five questions. Take out a paper.” Ranjith sir announced. I looked at my friend, blank. Her expression reflected mine. “Do you remember everything he taught in the class?” I whispered to her. Nisha looked up and started to try recollecting all the formulae. I looked at her, earnestly hoping for some good news. She turned to me and her face set off a warning bell in my head. ABANDON ALL HOPES!! I sighed.

Heera who sat right in front turned towards me. “Rishi?” She called, fear seeping into her voice. “What’s the portion?” I barely controlled my urge to laugh. I looked at my friends. I knew that there was only one thing running in our minds. Teamwork! I gave them a thumbs-up and took out a sheet of paper.

“Write ‘Test – 1’ on top of your sheet along with your name, roll number and section.” Sir continued. We followed his instructions. He waited for a minute. “Done?” He asked. “Now there’s something else I want you to write on your sheets.” He paused, letting us ponder over the possibilities. “Write as I dictate. ‘I, (write your name), solemnly swear...’” We all wrote down. “‘...that I will not cheat in the exam.’”

A chuckle rippled through the room. Sir remained calm. He waited till it subsided and then went on. “Now, only if you honestly swear you wouldn’t copy, then sign below what you wrote. I will go around and check. Mind you, I can remember who has signed and who hasn’t.”

People looked around, hesitant at first and then began to stir. “Please sign only if you are sure. I won’t judge you if you don’t. But...” He paused. “If you break the promise, it would send out a really bad vibe about you to everyone and to me. I would personally cut five marks from your internal scores.” A tensed silence lingered in the room as everyone decided. Then people began to sign. Nobody wanted to be called a cheater. It is one thing being caught for cheating and another when you are allowed to cheat in front of your lecturer. It just doesn’t sit right. Nobody wants to disappoint a teacher.

Ranjith sir went around the class looking at our papers and our signs. He smiled when he came back to the front of our class. “I am glad to see that so many of you have signed and I hope you keep your word.” He looked around, making an eye contact with everyone in the class. “Let’s start! Note down the questions.” He read out the questions and walked out, leaving us to ourselves with no invigilator. Pin drop silence lasted in the class.

The opportunity was before us. Everyone could’ve got a 5 /5 in the test. But nobody cheated. Because personal integrity is still valued, expected and respected.

Many people make promises in our life. From “I promise I’ll get you a chocolate” to “I swear I love you and nobody else” and “I promise you that promotion is yours after this assignment.” We have done so things in life trusting that word given by someone. We’ve finished pages of

homework for that surprise gift from our teacher. We've cast votes to politicians hoping for the development they assured. Some promises were kept. Some weren't.

Some broken promises can be understood. A sudden change of events or circumstances may not have let you keep your word. But again words lose meaning after they are broken too many times. It is not a compulsion to make promises. People do respect honesty even if they face an answer that might not be exactly what they want to hear.

In your workplaces, deadlines and promises made must be respected. Do not set impractical expectations for customer satisfaction. Failing to meet them would deem you untrustworthy and weak and that is not something you desire when you start a career. It's great if you finish your project in a few days when you had a week to finish. But it's not cool if you extend your deadline when you promised results in just two days.

Even in personal relationships, you want to be someone that's accountable and willing to commit or say no because apologizing for the failed commitments may not work all the time.

Every time you give your word, you are implying that others can place their trust in you and would never let them down. Not keeping your promise is like telling them that you have other things that have more value to you than them. It also tells us how less we can value our own word. Don't take promises casually. It is not just your credibility and relationships you are damaging. You are also letting yourself down.

There is a quote by Jon Snow, a character from the popular TV show Game of Thrones.

"When enough people make false promises, words stop meaning anything. Then there are no more answers, only better and better lies."

Oh! How we love the Starks! <3

By Joanne Jacob
B.E 3/4 ECE – A

TECHNICAL NEWS

Google's new Artificial Intelligence based system Tacotron 2 can articulate like humans. At Google I/O developers conference CEO of Google Sundar Pichai announced that it is shifting its approach from 'mobile first' to 'AI first'. It also launched Google lens, smart reply for Gmail and Google Assistant for iPhone.

<https://www.google.co.in/url?sa=t&source=web&rct=j&url=https://research.googleblog.com/2017/12/tacotron-2-generating-human-like-speech.html%3Fm%3D1&ved=0ahUKEwiT1qm69cTYAhUDq48KHWivCh8QFggvMAE&usq=AOvVaw25kBiWRBJ-gsNy-HkH7sq>



Amazon launches its voice assistant speakers Echo Dot, Amazon Echo and Echo Plus. The devices connect to 'Alexa'- a cloud based voice service that helps users to play music, set alarms, get information, access a calendar, get weather reports, etc.



<https://www.amazon.in/Amazon-Echo-control-weather-Membership/dp/B0725W7Q38>

South Korean Tech giant Samsung launched world's smallest DRAM chip. This is the second generation 10nm -class, 8Gbit chip. This is intended for cloud computing centres, mobile devices and high-speed graphic cards.



<http://www.newelectronics.co.uk/electronics-news/samsung-develops-worlds-smallest-dram-chip/166444/>



SELinux

Security-enhanced Linux or SELinux is an advanced access control built into most modern Linux distributions. It is a security module that provides extra protocols to ensure access control security. It supports mandatory access control (MC) and is an integral part of RHEL's (Red Hat Enterprise Linux) security policy.

https://en.m.wikipedia.org/wiki/Security-Enhanced_Linux



Search giant Google has launched two successors to its first Smartphone in its pixel hardware line-the Pixel 2 and Pixel 2 XL.

The pixel 2 is powered by a 1.9 GHz octa-core Qualcomm Snapdragon 835 processor and runs on Android's latest 8.0.0 Oreo OS version.

<https://gadgets.ndtv.com/google-pixel-2-4266>



iBall, a manufacturer of innovative technology products has launched a wireless 'keyboard and mouse' set. The set comes with unique silent keys and buttons for quiet typing and a distraction-free work environment. It is designed with 104 special soft-feel keys, including the numerical keypad. The high speed 1600cpi (count per inch) mouse ensures the users to adjust the speed of the mouse as per requirements. This device offers reliable performance upto 10 metres and 2.4GHz wireless transmission.

<https://www.iball.co.in/Product/Wireless-Combo-i4/11353>



Hive is a SQL like data warehouse infrastructure tool to process structured data in Hadoop. It resides on the top of Hadoop to summarise Big Data, and makes querying and analysing easy.

http://www.tutorialspoint.com/hive/hive_create_database.htm

Keras with Tensorflow back-end in R and Python

Longhow Lam



Keras is a high-level API for neural networks written in Python, which makes things even simpler. It is used in Deep Learning. Deep Learning is a new buzzword among researchers and practitioners. It has certainly opened the doors to some problems like image recognition, speaker-independent voice recognition, video understanding, etc. To make deep learning simpler there are already powerful frameworks/libraries such as TensorFlow from Google and CNTK (Cognitive Toolkit).

<https://keras.io/>

By: Srikar Chintha 3/4 ECE A
Mahitha 3/4 ECE B



IBM Bluemix

IBM Bluemix is a cloud PaaS (Platform as a service) that supports numerous programming languages. It can be used to run, deploy and manage applications on the cloud. We can create monitoring and notification applications in IBM Bluemix.

<https://www.ibm.com/cloud/>

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And also, not to forget, the entire Newton's Apple Team!