
SCHOOL OF ENGINEERING
ENGINEERS INSIGHT
MAY 2019

EDITORIAL

Engineers Insight

Volume 22

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FROM ENGINEERING PERSPECTIVE

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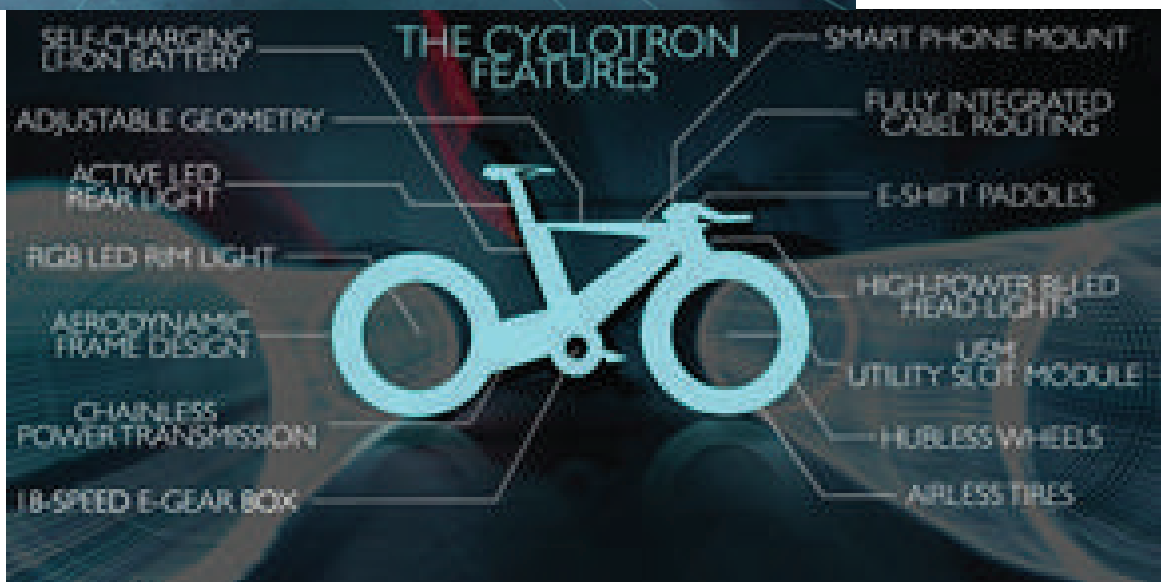
The Future of Spokeless Cycle

World's First Hubless Smart Bicycle - Electronic E-Gear Box - Fully Integrated - Space Grade Carbon Fiber - iPhone & Android App

All areas of our life are progressing and evolving very fast, new inventions appear literally every day, outdating the ones from yesterday. But looking at bicycles, they haven't evolved with nearly comparable speed within the last decades. To be highly innovative cycle one of the manufacturer evolved with a spoke-less cycle and space can used for different purpose like storage that can be carried from one location to another. This spoke-less cycle is under extensive & highly confidential development and testing, it is expected to be a next generation in bicycle era.

Contributor: Arun Seeralan
Source: https://www.kickstarter.com/projects/1989795590/the-cyclotron-bike-revolutionary-spokeless-smart-c



Utility Slots	Internal E-Gear Box & Encapsulated Drive Train	Additional Features incorporated
Improved aerodynamics (fully integrated brakes)	Super-fast shifts in < 0.2 seconds	Automatic Light Sensor
Airless tires (solid polymer, last +6,000 mi)	Up & Downshifts under load and while standing still	Bluetooth Low Energy (BTLE) Sensors
Integrated mud guards	E-Gear Box model with full electronic shifting (like a mouse click)	Real-time cycling data for every ride
		In-App Navigation
		Track & Train with Cyclo-Coach
		Autonomous accident & emergency reporting service
		Theft Prevention & GPS Bike Finder

That's why we've created the world's most advanced and versatile Smart Bike. The Cyclotron is fully connected, packed with tons of innovative features and controlled by the powerful Cyclo-App.

We believe a bicycle as a "utility" that should enable you to reach your goals. Wheather it is to get your groceries, taking your kids to the playground or simply having fun riding it.

To handle these different "tasks" we made the Cyclotron the most versatile and technically advanced bike available today. During the last years working on the Cyclotron project, we've developed a great number of ideas and solutions that make this bike truly unique. We're currently closer checking on more than 15 patents that we'll plan to file for. The Cyclotron is innovative power at it's best.

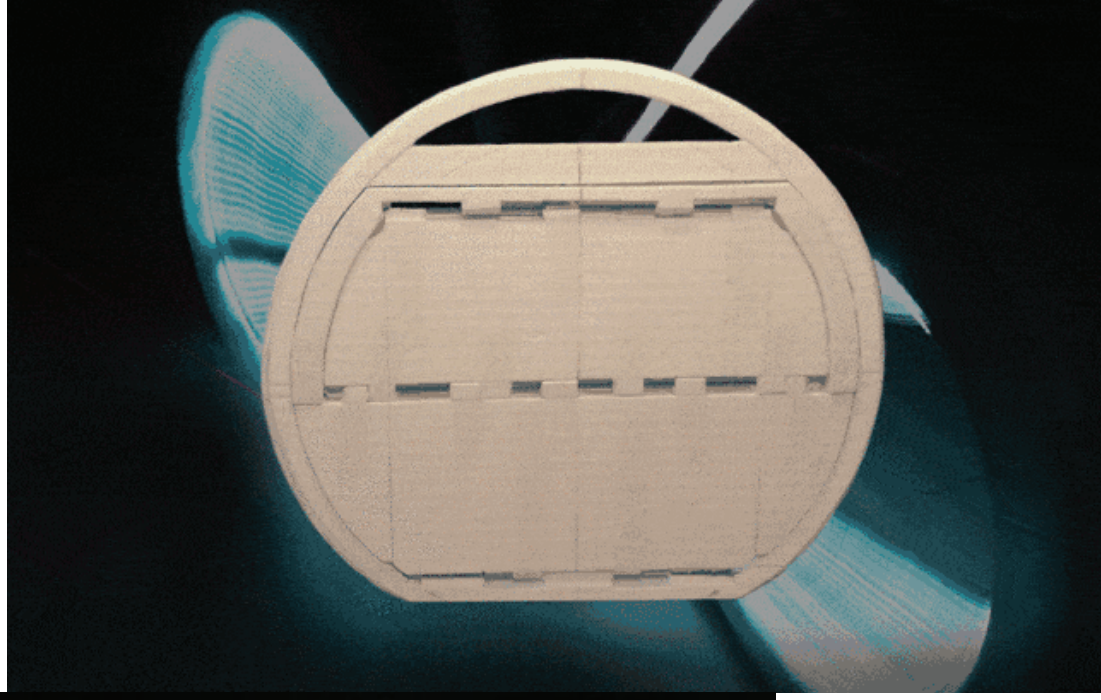
Utility Slot Module 1

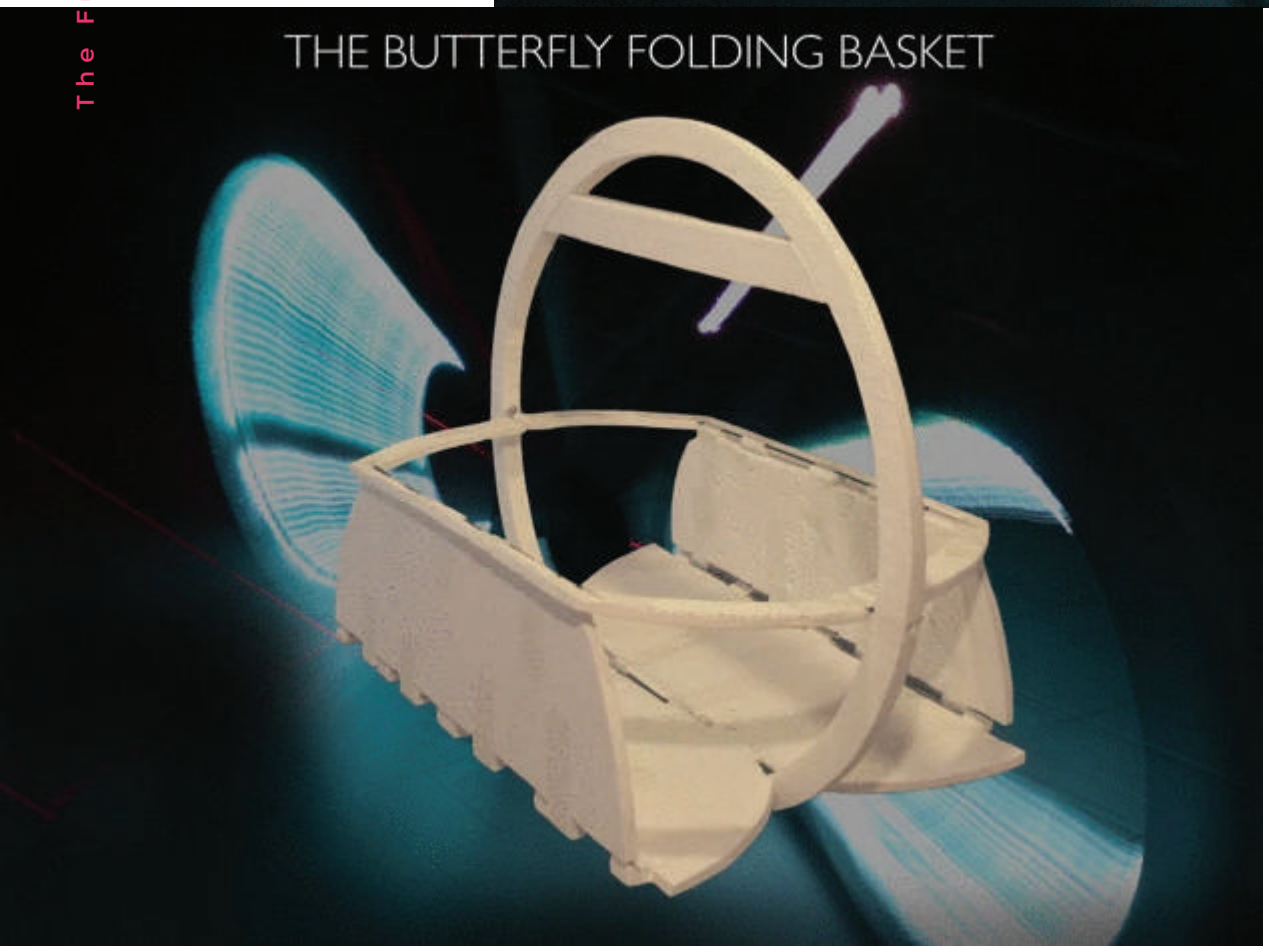
The Polygon Basket - The simplest way to add stowage

The polygon basket is made from composite fiber and is both: lightweight and durable. The dimensions are perfectly balanced, so you'll have a maximum space for stowage without getting too heavy when fully loaded.

Within one Polygon Basket you'll get enough space so stow two large grocery bags or two 6-packs of water. If you mount them in both wheels it equals 24(!) bottles of water, and you still have some space left in between.

Like the Polygon basket the Butterfly Basket is also light and durable. The amazing feature is, that it can be completely folded away, to a slim disk of just 2cm thickness when not needed.





Please Note: The front and back end of the Butterfly basket will be closed by a flexible mesh, that doesn't interfere with the folding mechanism and keeps your belongings inside the basket.

Utility Slot Module 2

The Butterfly Basket - The most elegant stowage that can fold away

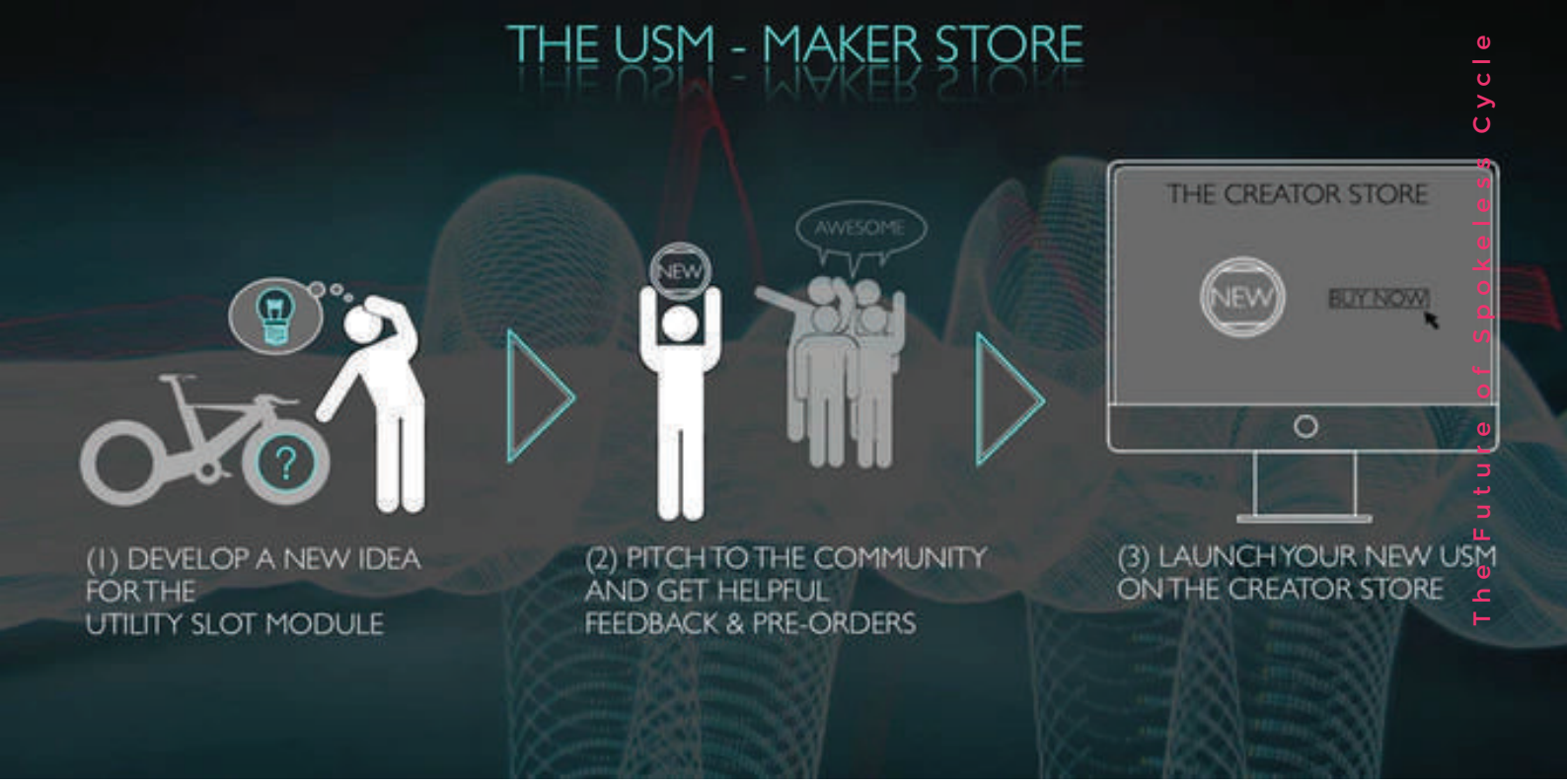
The Wingman is a groundbreaking child seat system that is fixed to the back wheel of the Cyclotron. You can choose weather you like to mount it on the left, the right or even on both sides of the Bike.

When your children are still too young to pedal for themselves, it has always been a problem taking them with you for a ride. As most of the Cyclotron team has kids, they encounter this problem, too.

The "easy-to-attach-quickly-removed" solutions are often insecure & sketchy and don't give you the confidence of having your child safely secured. On the other hand, safe and properly attached seats require a lot of time to mount and can't be removed easily when not needed. In most cases they're also quite heavy, bulky and hard to stow away when space is limited.

The Wingman - Innovative child seat system

Utility Slot Module 3



The USM Maker Store

Create your groundbreaking Utility Modules

The USM Maker Store is a place where you let your ideas for revolutionary USM's come true. Everything is possible, from 3D printed wind power generators to salmon leather messenger bags. You decide wheather to manufacture & ship by yourself, or hand the business to us.

We believe, that riders know best what riders need. So we'd like to encourage the whole community to develop their own "Utility Slot Modules" to make the Cyclotron Bike a continuously evolving organism that perfectly adapts to your lifestyle.

If you have a truly great, but yet unfinished concept of your USM, you also could team up with other makers to finish the remaining work together. These small groups can sell their USM's as a "Maker-Group" and share the earnings. This is another way, to get your idea in front of the community, too.

One of the big advantages of the Cyclotron's hubless wheels is the usable space that they offer. Instead of having just "swirled air" between your wheels, you can add different USM's (Utility Slot Modules) to your bike. The USM's are tool-less attached to the inside of your front or back wheel within seconds.

The Utility Modules can securely be locked inside the hubless wheel, when not needed, you can easily store them away, so you're not riding around with some unnecessary weight on your Cyclotron.

From the launch you can choose from four USM's. Within our Stretch Goals three more modules can be unlocked. You can order multiple modules together with your Cyclotron Bike by simply adding the amount to your pledge.

The Decals
Individual Vinyl Art Pieces for your Cyclotron Bike

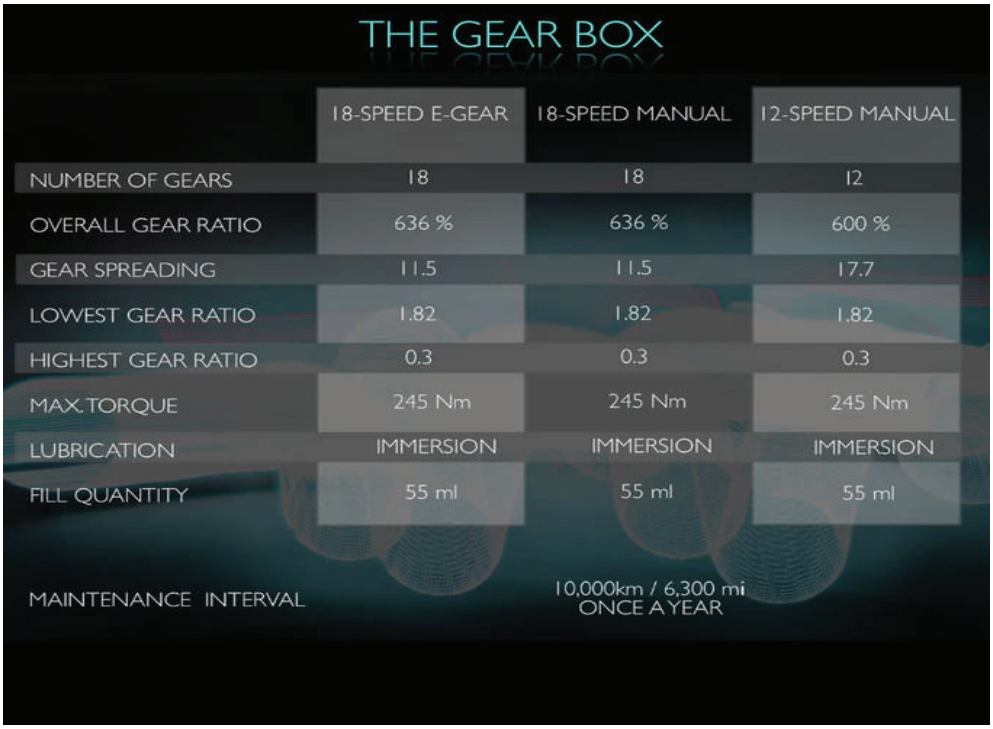
We believe the Cyclotron not just to be a technical revolution of gears and bolts, but also a platform for visual art & creativity.

The Decals for your Cyclotron Bike are printed on ultra durable outdoor vinyl, so they'll last for years. They're self-adhesive, very easy to apply and removable without any residues. We use the same quality of vinyl, that is used in professional car-wraping and facade advertising.

We'll launch The Decal Creator Store, so everybody can create their very own and individual look for the Cyclotron. You can easily choose an existing design, or create your own throughout the online editor. Just upload your artwork and we'll print & ship your quality vinyl decals in no time.

If you like to share your design with the community, you can even sell it within the Creator Store, and make other riders happy. With a few easy steps you can turn your bike into a "Rolling Art Piece" that reflects your personal style and is highly individual.

The Gear Box
We unchained the Bicycle



One of the biggest problems of regular bicycles we solved, is the exposed and vulnerable power transmission from the pedals to the rear wheel via a metal bike chain and gears. The oily chain and gears are mandatory "collecting" dust & dirt from the road, which reduces the efficiency of power transmission with every ride.

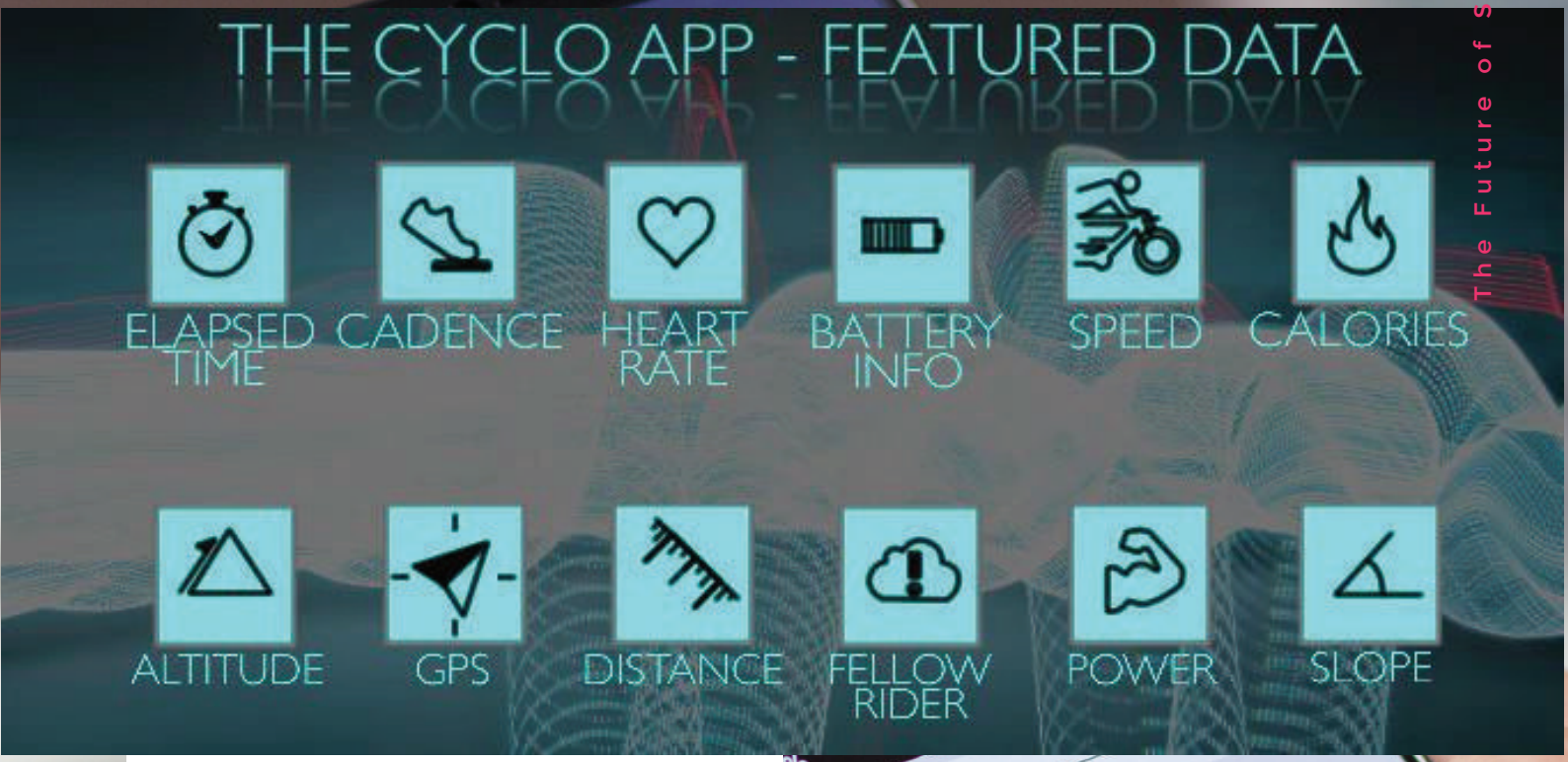
Also the shifting components of a regular Bike, like the derailleur and transmission cables are easy prey for dirt and damage. On a regular bicycle, they have to be serviced, greased & re-adjusted frequently.

We choose to equip the Cyclotron with a Sequential Gear Box, that is the latest development for bicycle power transmission available on the market today.

That results in NO MORE exposed mechanical components and VERY LITTLE need for maintenance. We recommend changing gear oil only every 10.000km / 6300mi or at least once a year. You don't need to be a bike technician, there are just two screws that need to be removed.

The Cyclotrons gear box offers up to 18 "Real Gears", wich means that they could be used without reducing efficiency. A classic 3x10 derailleur system offers, due to chain skew and overlap, only up to 15 gears.

The Cyclo App Take Control

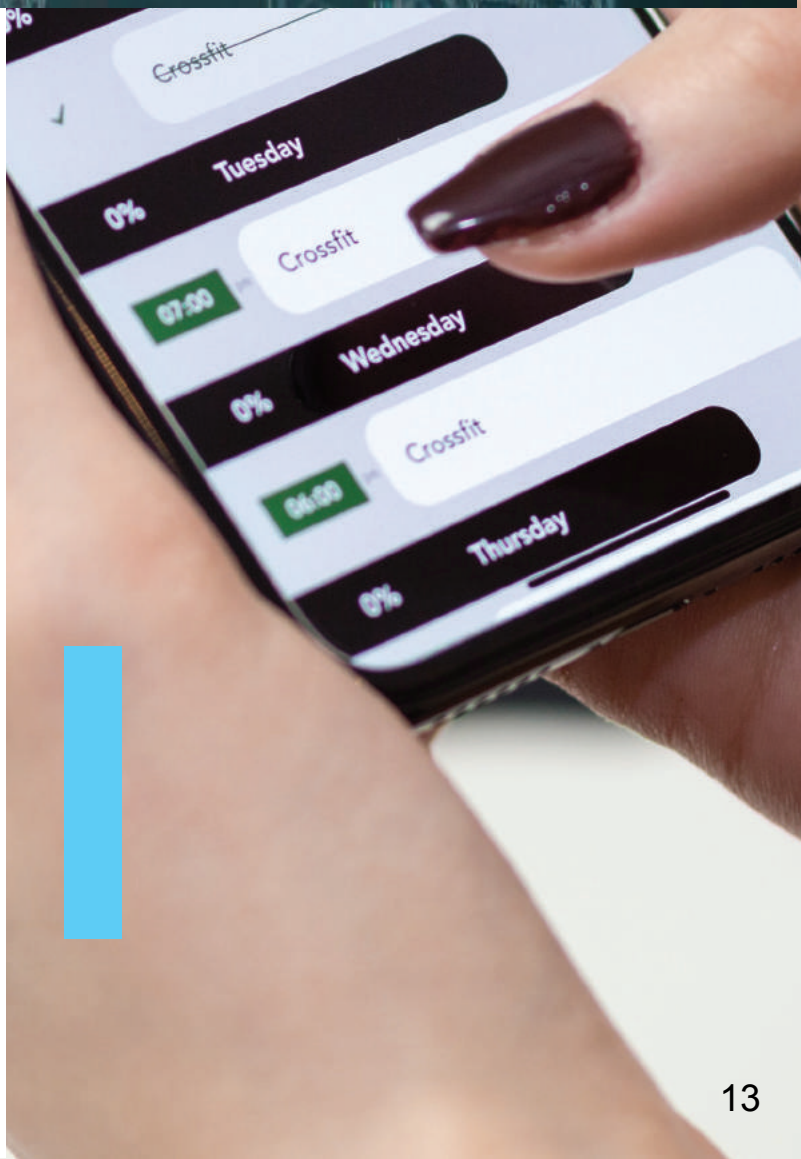


The Cyclotron App syncs seamless with all integrated on-board sensors of your Bike. The data for each ride is displayed in real-time and is automatically being saved to your Cyclo-Log.

But we don't want the Cyclotron App to be "just a nice display" on your handle bars, this is why we made it really smart. It continually learns from your habits and adjusts accordingly.

Your Cyclotron is loaded with more than 10 Sensors that operate on Bluetooth Smart / LE standard. All relevant cycling data is displayed within the Cyclo-App while you ride, and will automatically be saved for later reviewing or sharing.

While other people need to spend hundreds of Dollars for aftermarket Sensors, that have to be installed with lots of wires & mounts on the exterior of the bike's frame, the Cyclotron comes with pre-installed & fully integrated Sensors.



Look Who's Talking

When babies cry meeting engineering approach

Arrrggghhh..... my baby is crying again!!! She has taken her feed, her nappy has been changed, I just burped her.....(hello? I know I have to do this). She is not sick, she was just ok a minute ago... then, why is she crying now? Have gone through similar situations before? All parents out there, have you not wondered if you could just understand what your little ones are trying to tell you? Not only mothers (and fathers) take care of babies and need to understand them. Pediatricians, nurses, baby sitters and baby minders attend to babies too.

Most of the time, we hear people say 'Mothers understand their babies' cries..... Mothers have instincts to differentiate their babies' cries..... Do mothers really have these instincts? Are these inctincts built-in in them? Or is it more of a prediction system?

Mothers respond to cries depend on their own individual perceptions on the cries. For a first time mother, she might take several actions before she could actually calm her baby. As days go by, mothers get to understand their babies more. Mothers are somewhat trained. From the initial trial and error phase (baby cring and responding to the cries), data (knowledge) is collected by the mothers and is stored by them. Whenever baby cries again, mother responds to the cries with the action from the trained data and then comparison is made to check whether it satisfies baby. This is a sort of machine learning concept. However, since human prediction is based on non-clinical evidences, can it be taken account as an accurate prediction?

In 2006, Priscilla Dunstan appeared in the Oprah Winfrey show. She could actually understand baby language; their cries, to be in particular. She tested her method on one thousand newborns and it proved to be true. She classified the cries into five universal words (or sound reflexes). The sounds are:

•**Neh (I'm hungry)** - The sound is produced when the sucking reflex is triggered, and the tongue is pushed up on the roof of the mouth.

•**Owh (I'm sleepy)** - The sound is produced much like an audible yawn.

•**Heh (I'm experiencing discomfort)** - The sound is produced by a response to stress and discomfort due to skin reflex, such as feeling sweat or itchiness in the bum.

•**Eairh (I have lower gas)** - The sound is produced when babies have flatulence or an upset stomach.

•**Eh (I need to be burped)** - The sound is produced when a large bubble of trapped air is caught in the chest, and the reflex is trying to release this out of the mouth.

Dunstan's method has been used by many over the years and has been very effective. According to Dunstan, babies change their way of crying approximately after 3 months of age, once they realize there is no positive response to their cries. Dunstan's method is applicable when baby starts to cry and not when the cry has become hysterical.

Wouldn't it be easy if you don't have to try this hard to understand babies? Wouldn't it be easy if babies cries' could be understood instantly? Resarch has been conducted for over 25 years now on analyzing babies' cries. Machine learning algorithms are being used. Cause of babies' cries are recognised using frequency analysis of their voice.

According to J.Saraswathy et. al (2012) in their paper titled 'Automatic Classification of Infant Cry: A Review'; to distinguish the different types of infant cries, data goes through two main stages; signal processing and pattern classification. In the signal processing step, raw signal is normalized, cleaned and filtered before analyzing them using suitable feature extraction technique. The second step is the classification process where data collected is compared to the knowledge trained in the computer.

A research on infant cries were conducted by Sameena Bano and K.M Ravikumar. In their paper titled 'Decoding Baby Talk: Basic Approach for Normal Classification of Infant Cry System' (2015), they have analyzed the different cry signals to identify whether they actually correspond to the Neh, Owh, Heh, Eairh and Eh sound signals. Pitch frequency, short-time energy (STE) and Mel-Frequency Cepsum Coefficients (MFCC) were extracted from the baby cry signals and classified using the KNN (K-nearest neighbour) classifier. However, the tests were only done with 10 samples and the results obtained were not clearly stated.

Stavros Ntalampiras suggested an automatic non-invasive framework for monitoring infants and helping inexperienced/ trainee pediatricians, parents and baby sitters to diagnose infant cries in his paper 'Audio Pattern Recognition of Baby Crying Sound Events'(2015). He classified the cries into 5 categories; Hungry, Sleepy, Need to Burp, Need Change and Pain. The success rate in recognition was more than 90%.

The feature extraction method used here is

For detail accuracy: Hungry 98.1% Sleepy 93.9% Need to Burp 92.7% Need Change 95.3% Pain 92.5%

Cepstal Coeficients (MFCC) and Teager Energy Operator (TEO) Based Features. Reservoir Network (RN) was used as the classifier.

Kaoru Arakawa in her paper 'Recognition of the Cause of Babies Cries from Frequency Analysis of Their Voice- Classification Between Hunger and Sleepiness' found that when a baby (5 to 12 months old) is hungry, the audio frequency spectrum is in the high frequency region (continuous detection of stripes on spectogram from 6kHz to 10kHz or even a slight detection of stripes from 11 kHz to above 15 kHz) whereas the spectrum has a very low frequency region (0 to 6 kHz) when sleepy. However, the threshold of the frequency depends on the babies' month age too.

Raina P. Daga and Anagh M. Pandi in their paper titled 'Acoustical Analysis of Pain Cries in Neonates: Fundamental Frequency' (2011) researched on the acoustic frequency when babies are in pain. The Welch method and 256 point Fast Fourier Transform (FFT) has been used for determining the fundamental frequencies. For male babies, it is found to be 420 Hz whereas for female it is found to be 370 Hz.

Research aside, how about a practical device to help caregivers to understand babies' cries? Well, good news is, it is already out there in the market.....Recently, Taiwanese researchers launched a smartphone application (app) called Infant Cries Translator. It detects and analyses the cries and convey what the cry means. The app can distinguish four different type of cries; hunger, wet, sleepy and pain. Caretaker needs to switch on the app and leave it near the crying baby for 10 seconds and the app will predict the cause of the cry. If the caregiver thinks it is the wrong prediction, the caregiver can make revision to the app. This app can be downloaded into our smartphones with a small fee.

This app is the outcome of research done for more than 2 years on approximately 100 newborn babies. The app is based on machine learning algorithm and constantly updates its database in the cloud. The accuracy of prediction varies with the age of the baby. It is most accurate for infants under 2 weeks old with 92% accuracy whereas for babies from 2 weeks to below 2 months, the accuracy is 84-85% and further reduces to 77% when baby reaches 4 months old. This app however is not so suitable for babies above 6 months of age as their cries change due the environment and people surrounding them.

There are many researches being conducted on infant cries. The research does not only stop at normal, healthy babies but also on babies who have cleft palates, autistic and babies who have hearing disorders and Respiratory Distress Syndrome (RDS). When a caregiver understands the little ones he/ she is handling, life becomes less stressful for both the caregiver and the little ones. A better quality time to be spent with your little ones minusing all the late nights (and coffee!!!).....

Contributor: Shamini

Source
1.J.Saraswathy et. al (2012) 'Automatic Classification of Infant Cry: A Review' International Conference on Biomedical Engineering (ICoBE),27-28 February 2012,Penang
2. Sameena Bano and K.M Ravikumar. In their paper titled 'Decoding Baby Talk: Basic Approach for Normal Classification of Infant Cry System' (2015), International Journal of Computer Applications (0975 – 8887) International Conference on Current Trends in Advanced Computing (ICCTAC-2015)
3. Stavros Ntalampiras 'Audio Pattern Recognition of Baby Crying Sound Events'(2015). Journal of the Audio Engineering Society PAPERS Vol. 63, No. 5, May 2015 (C 2015) DOI: http://dx.doi.org/10.17743/jaes.2015.002
4. Kaoru Arakawa 'Recognition of the Cause of Babies Cries from Frequency Analysis of Their Voice-Classification Between Hunger and Sleepiness' https://www.researchgate.net/publication/266483983
5. Raina P. Daga and Anagh M. Pandi in their paper titled 'Acoustical Analysis of Pain Cries in Neonates: Fundamental Frequency' (2011) Special Issue of International Journal of Computer Applications (0975 – 8887) on Electronics, Information and Communication Engineering - ICEICE No.3, Dec 2011

by HARVIN KAUR

PLASTIC POLLUTION IS THREATENING THE MARINE ECOSYSTEM WORLDWIDE.

OVER THE NEXT TEN YEARS, THE AMOUNT OF MARINE PLASTIC WASTE WILL DOUBLE AND IF WE DO NOT ACT, IN 2050 THE OCEANS WILL CONTAIN MORE PLASTIC WASTE THAN FISH BY WEIGHT.

Contributor: Harvin Kaur
Source:
1. https://www.pewtrusts.org/en/research-and-analysis/articles/2018/09/24/plastic-pollution-affects-sea-life-throughout-the-ocean
2. https://www.greenpeace.org/usa/toxic-ecosystems-the-impact-of-plastic-on-marine-life/


OUR WORLD OCEAN
provides
THE AIR WE BREATHE
>50% The ocean produces over half of the world's oxygen and stores 50 times more carbon dioxide than our atmosphere.
CLIMATE REGULATION
70% Covering 70% of the Earth's surface, the ocean transports heat from the equator to the poles, regulating our climate and weather patterns.
TRANSPORTATION
76% Percent of all U.S. trade involving some form of marine transportation.
RECREATION
From fishing to boating to kayaking and whale watching, the ocean provides us with so many unique activities.
ECONOMY
$282 billion Amount the U.S. ocean economy produces in goods and services. Ocean-dependent businesses employ almost 3 million people.
FOOD
The ocean provides much more than just seafood. Ingredients from the sea are found in surprising foods such as peanut butter and soymilk.
MEDICINE
Many medicinal products come from the ocean, including ingredients that help fight cancer, arthritis, Alzheimer's disease, and heart disease.

HOW MUCH PLASTIC WASTE DOES SINGAPORE GENERATE?

822,200 TONNES OF PLASTIC WASTE WERE PRODUCED IN 2016. THAT'S ABOUT 150KG PER PERSON EVERY YEAR! OUT OF THIS, ONLY 7 PERCENT IS RECYCLED. THE REST IS INCINERATED AND SENT TO THE LANDFILL.

IS IT OK TO INCINERATE PLASTIC?

NOT REALLY. SINGAPORE HAS HIGHLY EFFICIENT INCINERATORS THAT CAPTURE MOST OF THE TOXIC GASES CREATED WHEN PLASTIC IS BURNED. HOWEVER, THESE INCINERATORS ALSO GENERATE LARGE AMOUNTS OF CARBON DIOXIDE - ABOUT AS MUCH AS A COAL POWER PLANT! DUMPING ALL THIS CARBON DIOXIDE INTO THE ATMOSPHERE ACCELERATES GLOBAL WARMING AND CLIMATE CHANGE. THE ASH THAT REMAINS AFTER THE PLASTIC IS BURNED REMAINS TOXIC. THE ONLY PLACE WE HAVE TO PUT IT IS THE LANDFILL ON PULAU SEMAKAU. AT CURRENT RATES, SEMAKAU LANDFILL WILL BE COMPLETELY FULL BY 2035. NEARLY ALL PLASTIC IS MADE FROM FOSSIL FUELS. THE PROCESS OF EXTRACTING AND TRANSPORTING FOSSIL FUELS CONTAMINATES OUR AIR AND WATER, AND THREATENS THE LIVES OF PLANTS AND ANIMALS.

HOW DOES PLASTIC AFFECT OCEANS AND MARINE ANIMALS?

NOT ALL PLASTIC WASTE GETS INCINERATED. A LOT OF PLASTIC, ESPECIALLY LIGHT ITEMS LIKE STRAWS AND PLASTIC BAGS, GET BLOWN OR SWEPT AWAY INTO OUR DRAINS AND INTO THE SEA. PLASTIC MAKES UP 90 PERCENT OF MARINE LITTER. PLASTIC WASTE HURTS AND KILLS MARINE ANIMALS. SMALL ANIMALS ARE SMOTHERED IN PLASTIC BAGS, WHILE LARGE ANIMALS SUCH AS TURTLES AND DOLPHINS GET TRAPPED IN PLASTIC NETS AND PLASTIC RINGS. ENTANGLED ANIMALS DIE A SLOW DEATH FROM STARVATION AND SUFFOCATION.


9 REASONS TO REFUSE SINGLE-USE PLASTIC
1
Made from fossil fuels
2
Huge carbon footprint
3
Will still be here in hundreds of years
4
Only a tiny percentage is recycled
5
Leaches toxins into food & drink
6
Causes hormone disruption & cancers
7
Pollutes our oceans
8
Kills marine animals and birds
9
Enters our food chain
LESS PLASTIC.

HERE ARE SOME OF THE WAYS YOU CAN MAKE A DIFFERENCE

1. BRING YOUR OWN SHOPPING BAG

THE USEFULNESS OF THESE THIN AND EASILY RIPPED BAGS IS EXTREMELY LIMITED, YET ACCORDING TO ONE ESTIMATE, SOMEWHERE BETWEEN FIVE BILLION AND ONE TRILLION PLASTIC BAGS ARE USED EACH YEAR AROUND THE WORLD. ALTHOUGH FREE TO SHOPPERS, THESE BAGS HAVE A HIGH ENVIRONMENTAL COST AND ARE ONE OF THE MOST UBIQUITOUS FORMS OF GARBAGE. BRINGING YOUR OWN PLASTIC BAG IS COMMON BUT GOOD ENVIRONMENTAL ADVICE, SUCH GOOD ADVICE THAT SOME GOVERNMENTS IMPLEMENT POLICIES TO ENCOURAGE MORE PEOPLE TO DO IT. DISPOSABLE SHOPPING BAGS HAVE BEEN BANNED IN A NUMBER OF CITIES AROUND THE WORLD LIKE SAN FRANCISCO, WASHINGTON, D.C., KIGALI, MEXICO CITY, RANGOON, 12 CITIES IN AUSTRALIA AND MANY OTHERS. IN ADDITION TO BIGGER CARRYALL BAGS, YOU CAN FURTHER REDUCE WASTE BY BRINGING YOUR OWN REUSABLE PRODUCE BAGS OR SKIPPING THEM ENTIRELY..

2. STOP BUYING BOTTLED WATER

UNLESS THERE'S SOME KIND OF CONTAMINATION CRISIS, PLASTIC WATER BOTTLES ARE AN EASY TARGET FOR REDUCING WASTE. INSTEAD, KEEP A REFILLABLE BOTTLE HANDY.

3. BRING YOUR OWN THERMOS TO THE COFFEE SHOP

SPEAKING OF REFILLABLE, BRINGING YOUR OWN THERMOS FOR TO-GO COFFEE IS ANOTHER WAY TO REDUCE YOUR PLASTIC FOOTPRINT. DISPOSABLE COFFEE CUPS MIGHT LOOK LIKE PAPER BUT THEY'RE USUALLY LINED WITH POLYETHYLENE, A TYPE OF PLASTIC RESIN. IN THEORY THESE MATERIALS CAN BE RECYCLED, BUT MOST PLACES LACK THE INFRASTRUCTURE TO DO SO. THEN THERE ARE LIDS, STIRRERS, AND COFFEE VENDORS THAT STILL USE POLYSTYRENE FOAM CUPS—WHICH CAN ALL BE AVOIDED WITH YOUR OWN MUG.

4. CHOOSE CARDBOARD OR PAPER OVER PLASTIC BOTTLES AND BAGS

GENERALLY SPEAKING, IT'S EASIER TO RECYCLE CARDBOARD THAN PLASTIC, PLUS PAPER PRODUCTS TEND TO BIODEGRADE MORE EASILY WITHOUT ADDING A LOT OF WEIGHT TO THE PRODUCT THE WAY GLASS OR ALUMINUM CAN. SO, WHEN YOU HAVE THE CHOICE, PICK PASTA IN THE BOX INSTEAD OF PASTA IN A BAG, OR DETERGENT IN THE BOX INSTEAD OF THE BOTTLE. EVEN BETTER WOULD BE TO CHECK FOR COMPANIES THAT SOURCE THEIR CARDBOARD SUSTAINABLY OR HAVE A STRONG STANCE ON DEFORESTATION.

5. SAY NO TO PLASTIC STRAWS

WHETHER FOR HOME USE OR WHEN YOU'RE ORDERING A DRINK AT A BAR OR RESTAURANT, PLASTIC STRAWS ARE OFTEN A SINGLE-USE ITEM THAT'S JUST NOT NECESSARY.

6. RE-THINK YOUR FOOD STORAGE

PLASTIC BAGGIES, PLASTIC WRAP, AND PLASTIC STORAGE CONTAINERS ARE WORTH RE-EVALUATING. INSTEAD OF SANDWICH BAGGIES, WHY NOT PACK A BENTO BOX OR A CUTE TIFFIN FOR LUNCH? INSTEAD OF THROWING AWAY PLASTIC ZIPPER BAGS OR WRAPPING THINGS IN SARAN WRAP, WHY NOT USE JARS OR GLASS CONTAINERS IN THE FRIDGE? WHEN IT COMES TO CARRYOUT, THESE TYPES OF CONTAINERS BE USED INSTEAD OF DISPOSABLE ONES—ALTHOUGH IT CAN DEFINITELY TAKE A BIT OF COURAGE AND SOME EXPLAINING TO HELP YOUR LOCAL RESTAURANTS TO UNDERSTAND.

7. SHOP IN BULK

FOR MANY HOUSEHOLDS, THE MAJORITY OF PLASTIC WASTE IS GENERATED IN THE KITCHEN. SO ONE OF THE BEST WAYS TO REDUCE THE PACKAGING WASTE MADNESS IS TO BRING YOUR OWN BAGS AND CONTAINERS AND STOCK UP ON BULK FOODS. SHOPPING WITH JARS IS A GREAT OPTION, AND KEEP YOUR EYE OUT FOR BRANDS WITH REFILLING STATIONS.

IT'S TIME TO RETHINK PLASTIC AND SAVE OUR WILDLIFE AND OUR OCEANS.

ASIA PACIFIC UNIVERSITY

SCHOOL OF ENGINEERING

TECHNICAL VISIT

ORGANIZED BY LECTURERS, IASS

A PRACTICAL EXPERIENCE IN ELECTRICAL ENGINEERING

ELECTRICAL AND ELECTRONICS ENGINEERING STUDENTS EXPLORED THE HIGH VOLTAGE LAB IN UNIVERSITY MALAYA

AS PART OF THEIR HIGH VOLTAGE ENGINEERING MODULE, YEAR 4 STUDENTS FROM UC4F1806EEE OF B. ENG (HONS) IN ELECTRICAL & ELECTRONIC ENGINEERING PROGRAMME PLANNED, ORGANIZED AND MANAGED A TOUR TO THE UNIVERSITY MALAYA LAB AND CONDUCTED THREE EXPERIMENTS AT THE LAB ITSELF WHICH ARE:

1. EXPERIMENT 1: ELECTRICAL BREAKDOWN UNDER DC VOLTAGE

2. EXPERIMENT 2: ELECTRICAL BREAKDOWN UNDER AC VOLTAGE

3. EXPERIMENT 3: ELECTRICAL BREAKDOWN UNDER IMPULSE VOLTAGE

THE STUDENTS WERE DIVIDED INTO 2 GROUPS WHERE EACH GROUP TOGETHER WITH LECTURERS, MR. MOHAMAD AFFAN BIN MOHD NOH AND IR. JACQUELINE LUKOSE COMPLETED THOSE EXPERIMENTS ON 13TH AND 14TH OF FEBRUARY 2018.

THE TRIP WAS AN ENJOYABLE EXPERIENCE FOR THE GROUP; APART FROM LEARNING IN THE CLASSROOM, STUDENTS ALSO GOT TO EXPERIENCE SOME OF THE EXPERIMENTS CONDUCTED IN UNIVERSITY MALAYA.

Industrial Visit to ABB

Engineering students visited the ABB industrial and they gained the knowledge about the industrial safety. After the brief description on the industrial safety students were taken to a tour inside the industry to gain more knowledge about the selection of electronic components and assembling them to form the circuits. Students learnt about the installation of MCP and how to connect different components according to the industrial standards. Students learnt about the testing process of each circuits after assembly of electronic components to form the circuit.

Students were explained about the seven axis robot-arm manufactured the ABB industry. They even learnt about the different sensors used for the seven axis robot arm and their functions with the outcome results.


PETROLEUM
GEOLOGY
FIELDWORK
1ST MARCH 2019

DETAILS:
NUMBER OF STUDENTS: 20
NUMBER OF ACCOMPANYING LECTURERS:
3 (DR. AMIN, MS. AILIE, MS. HARVIN)

LIST OF SITES:

1. BANDAR MAHKOTA CHERAS, (IGNEOUS ROCK, FAULT)

2. GEOLOGICAL MUSEUM, IPOH


Pasir Laut

3. KEK LOK TONG CAVE, PERAK, (SEDIMENTARY ROCK-LIMESTONE, RECUMBENT FOLD)

A VISIT TO 3D GENS

Technical visit to 3D Gens Sdn Bhd
Date: 17-01-2019
Time: 9am – 1 pm
Address: No. 6-01 Level 6th Plaza Azalea Persiaran Bandaraya, Seksyen 14, 40000 Shah Alam Selangor
Author: Kumaresan Magaswaran, Vikneswary Jayapal, Shamini Patpanavan

The very first 3D printer appeared in 1984 and was named stereo-lithography. It was also known as SLA. The SLA method of 3D printing took the field of product development through a quantum leap with its ability of rapid prototyping. About 6 years later the more familiar form of 3D printing which is the Fused Deposition Modeling (FDM) came into existence. Another method worthy of mention is the Selective Laser Sintering (SLS) which has great potential to be used as an additive manufacturing method on an industrial scale. These three methods have been around through the 90s and in the first decade of the 21st century. In its early days, its inventors through patents held an iron grip onto the technology. Therefore only organizations with a sizable capital were able to utilize 3D printing for their product development and prototyping needs. Only when the opportunity to cash in from that exclusive market dwindled, some well-established educational institutions were able to introduce 3D printing into their curriculum. Then came the day those patents expired and the 3D printing technology was truly liberated resulting in an explosion of 3D printing to the community. The cost of a 3D printer reduced gradually, giving rise to a growing number of 3D printing enthusiast. The enthusiast brought growth to the 3D printing technology, driving innovation and pushed the limits of the 3D printer.

The liberation of the 3D printing technology has been disruptive in many industries. One such industry is where 3D Gens Sdn. Bhd. have embarked, the medical industry. 3D Gens specializes in producing cranium implants for reconstruction of defective skulls. The application of 3D printing revolutionized the way skull reconstructive surgery is done. Traditionally surgeons would obtain a MRI scan of the patient's skull before the surgery. Even with a scan, the surgeon only gets an accurate visual of the defect during surgery. Only then the surgeon will grab a piece of titanium plate, cuts and shapes it by hand before installing it on to the patient's skull. This takes up to 8 hours.

However this have changed with the application of the 3D printing by 3D Gens. The scan is sent to 3D Gens where the designer reconstructs the defective skull using a CAD software. Then the engineer designs the titanium implant for the defective area of the skull. Once the implant is fitted on to the skull in the CAD software a mould to shape the titanium implant is designed. Upon completion of the mold design, the skull and the mould is 3D printed. The printed mould is used to shape the titanium plate which will be used as implant. Once the implant is shaped it is fitted onto the 3D printed skull to check for its fit. Finally the 3D Printed skull and the implant is delivered to the surgeon where the surgeon gets a visual of the defect and the implant. This better prepares the surgeon for the surgery resulting to almost 50% reduction in surgery time. Thus reducing workload on the surgeon and enabling more surgery to be conducted per day.

Coming back to the visit, it was indeed fruitful as it started with a talk on 3D printing followed by observance on the process of producing implants. Besides cranium implants, 3D Gens also ventured into dental implants. Even though the medical industry is the core business of 3D Gens, Dr.Izhar, the founder and CEO of 3D Gens opened its door to arts, engineering and education. The move into other fields may not be as profitable as the medical industry but yet the move was made mainly driven by the staff of 3D Gens which comprised of creative designers and engineers. The services offered to the education sector is mainly for students to print their project works where a hefty discount is given.

As the visit ended the 25 participants walked away with a variety of thoughts. Some excitement that the 3D printing technology is making strides in a non-conventional industry. What more can the 3D printer do? Some delight seeing a hobby leading to a career. Many inspired to see a technology being disruptive. No matter what was the state of mind at the end of the visit, the notion that a spark was ignited in the minds of the participants is a testimony that the objectives of such technical visit is achieved.

Group picture after the visit

CHEMOIL ENGINEERING (M) SDN. BHD. INDUSTRIAL VISIT

On 11 March 2019, Asia Pacific University of Technology & Innovative (APU), School of Engineering had led a team of Mechatronic Engineering, Level-3 students to visit an Oil & Gas Company – Chemoil Engineering (M) Sdn. Bhd by Mr.Alexander Chee.

Chemoil Engineering (M) Sdn. Bhd. located at Port Klang and the company is a diversified chemical and engineering company that combines the power of science and technology with the "Human Element" to constantly improve what is essential to human progress. The Company delivers a broad range of products and services cheap rolex to customers in around 15 countries. (*quoted from Chemoil Engineering Websites*).

Students departed 12:30pm and arrived the factory at 1:30pm. Mr.Athan, the project manager who worked more than 5 years in the company, had shown a warm welcome to the students. Before entering the compound, safety briefing had been conducted by the plant manager – Mr.Kidd.

Figure 1: Safety Briefing

Figure 2: Company Introduction by Project Manager (Mr.Athan)

Before starting the main course, Mr.Athan gave a short introduction of Chemoil Engineering (M) Sdn. Bhd. background, organization structure and the major business of the company. To build and monitor a production plant is always not an easy work, Mr.Athan not only shared the his

valuable working experiences to the students, at the same time, how the step-by-step process from drafting, design and finally setup the plant at Port Klang. The plant currently established the business connection with more than 15 countries around the world which included South-East-Asia and Middle East.

Figure 3: Company Introduction by Project Manager

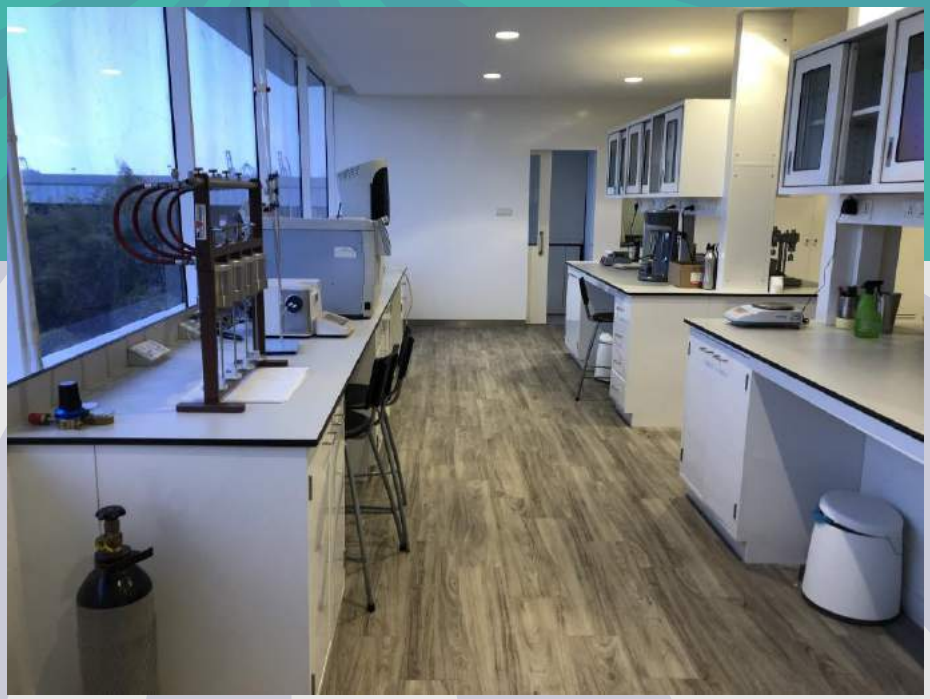


Figure 4: Laboratory Visitation

Chemoil Engineering Sdn. Bhd. is always looking forward to produce and provide the best product and service to their client. In order to achieve that, the company invested the money to setup a research and testing laboratory. The main purposes of the laboratory included to verify the quality of the product, as well as to study and investigate new chemical product which related to oil & gas industry.

Figure 5: Demonstration on Sample Testing (I)

The plant engineers carefully explained on the working principles of the equipment and how is process of preparing sample for testing and quality verification. Every equipment in the laboratory is high precision and accuracy equipment and must be well-taken care in every operation. However, the engineers did allow the students to try some hands-on work after the explanation and demonstration. This able to enhance the understanding towards the process for the students.

Figure 6: Mixing Silo and Storage Tank

The major equipment of the production plant is the mixing silo. From storage tank (raw material) to mixing silo (mixing process), how the process been carried out as well as the procedure of operating the mixing silo. This is to make sure no wrong chemical will be mixed and will cost a big loss to the company.


Figure 7: Explanation in the Production Sector (I)

Students shown a strong interest and passion to visit the production plant even though the place is not a pleasant space to walk. Everyone was looking forward for the golden opportunity to enter the location where normal day are only engineers allowed to enter and understand the production process. That surely will gave a glimpse for all the future engineers what and how the future career are is waiting for them especially in Oil and Gas industry.

Figure 8: Explanation in the Production Sector (II)

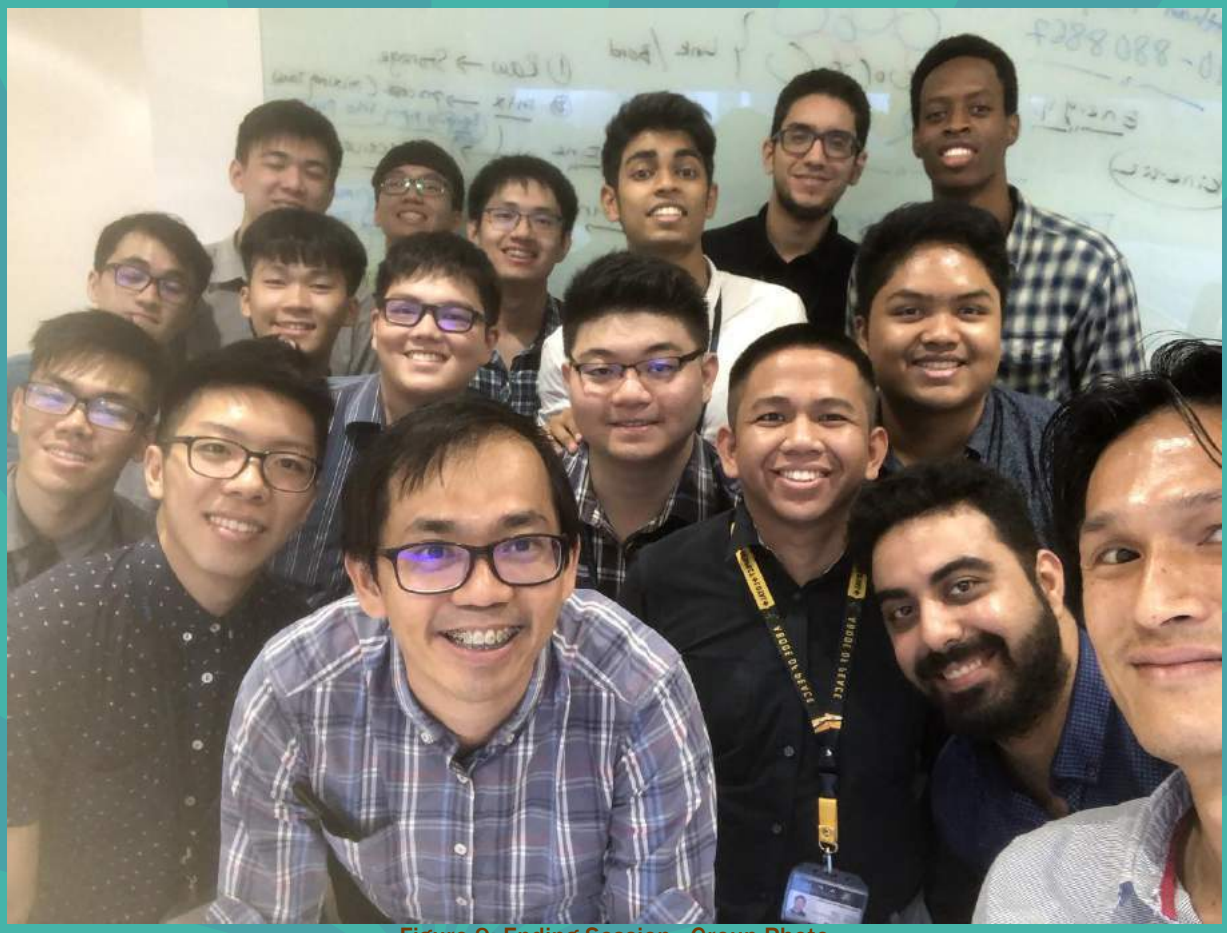


Figure 9: Ending Session - Group Photo

During the ending briefing session, Mr.Athan, who played the major role on planning and designing the plant and put it into operation, shared with students regarding the future of Oil & Gas Industry in Malaysia, and around the world. He even extended passion on training the future engineer by open-up internship opportunity in the company. He allow the visited students contact him anytime for further related-assistance in the coming future.

Mr. Athan also emphasized the industry required tough-mind and well-trained engineers, which the number is seems dropping in Malaysia. He is looking forward more young engineer can rise-up to commit themselves in this particular industry.

ARDUINO WORKSHOP

Jan 26, 2019

PLC Lab, School of Engineering

The Arduino Workshop was held on the 26th of January. The Workshop took place in the Labs located in the APU. The Goals of the Workshop is to get the freshmen student to get there hands on what lays a head of them to keep them and teach them to be one step further than the rest.

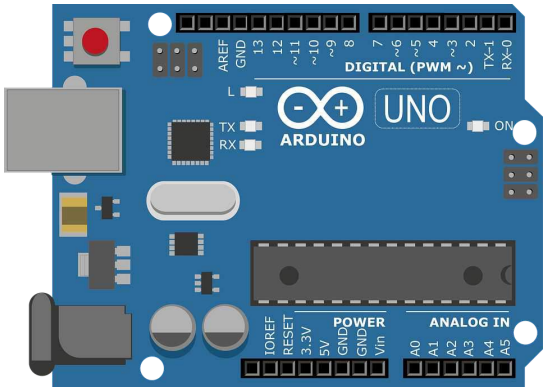
The perpetration for this part was done a few days before the workshop each boe-bot and each component were tested to make sure a flowless workshop experience. The boe-bots were inspected and repaired by the IMechE members. All the component required were tested as will diode, Arduino, ultrasonic sensor and battery all of which are working correctly and according to plan. All of the component were divider for each student and given to them one part at a time to be synchronies with the hardware explanation done by Mr. Arun Seeralan Balakrishnan but some student had to sur the set of component because there where a lack of factional ones.

The workshop started with Mr. Arun Seeralan Balakrishnan introducing the works shop and the objective of the workshop. The workshop was divided in to suction in order to simplify the learning so the students can get most of the workshop. The first part was to teach the software aspect of the Arduino. The interface of the IDE was display and explained by Mr. Arun Seeralan Balakrishnan the two main loops were the core of the Arduino programming so it been explain with great details to the student and making sure that each individual student get his question answer and get his fill understanding of the part since the next part depend on it, the actual programming will come after the explanation of the hardware.

After the explanation of the hardware now is the time to program it to make whatever function the students would imagine but first the basics. The first program was to turn on and off an LED with a desired time delay. The majority of the student did this task with no problem snice it was a basic one. The program line was displayed in the projector for the student if needed. After this task is done now the student have the ability to control a specific pins to be either input or an output.

In the final part of the workshop the student where given a task of combing the different electrical combined together by combing the code that already have been given to the student.

Group picture after completing the workshop



Industrial Visit to

Scientific & Technical Products Sdn Bhd

12th March 2019

Lecturer Names:

1. **Dr. Raed Mohammed Taher Abdulla (Telecommunication Engineering)**
2. **Ir. Jacqueline Lukose (Electrical and Electronic Engineering)Lecturer Names:**

SCHOOL OF ENGINEERING, ASIA PACIFIC UNIVERSITY OF TECHNOLOGY AND INNOVATION (APU). NUMBER OF PARTICIPANTS: TOTAL OF 20 STUDENTS FROM (ELECTRICAL, ELECTRONIC AND TELECOMMUNICATION PROGRAMMES)

Scientific & Technical Products Sdn Bhd provided an opportunity to visit their showroom to see the latest product updates and technological innovations, such as:

- IOT Technology Educational Training System
- Intelligent Robotic & Drone Educational Training System
- Green & Renewable Energy Training System
- Wireless Mobile Communication Training System

Educational 3D printer and CNC solution

The objective behind this visit was to bridge the gap between classroom theoretical training and practical learning in a real-life environment. Through industrial visits, students gain hands on practical knowledge on various industrial processes and its management concepts, they ask questions related to their area of interest.

In short, this visit gives them exposure from academic point of view and provides exposure to practical working environment, increases practical awareness of various Industrial sectors.


Global Centre

WORKSHOP-MATLAB/SIMULINK ON DIGITAL MODULATION

APRIL 24, 2019 (WEDNESDAY)

TIME: 1:45-3.45PM
VENUE: S-04-COMM LAB / NEW CAMPUS
SPEAKER: DR. RAED MOHAMMED TAHER ABDULLA

DIGITAL MODULATION PROVIDES MORE INFORMATION CAPACITY, HIGH DATA SECURITY, QUICKER SYSTEM AVAILABILITY WITH GREAT QUALITY COMMUNICATION. HENCE, DIGITAL MODULATION TECHNIQUES HAVE A GREATER DEMAND, FOR THEIR CAPACITY TO CONVEY LARGER AMOUNTS OF DATA THAN ANALOG MODULATION TECHNIQUES. THE WORKSHOP HELPS THE STUDENTS TO KNOW ABOUT MANY TYPES OF DIGITAL MODULATION TECHNIQUES AND ALSO THEIR COMBINATIONS, DEPENDING UPON THE NEED, SUCH AS AMPLITUDE SHIFT KEYING, FREQUENCY SHIFT KEYING, AND PHASE SHIFT KEYING