

# IEEE PUA SB MAGAZINE

## — *SPATIUM*

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VOLUME | 01  
AUGUST 2020

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06 • A LOOK INSIDE IEEE

```

3 require File.expand_path("../spec_helper.rb", __FILE__)
4 # Prevent database transaction from being rolled back on failure
5 abort("The Rails environment is running in production mode!")
6 require "spec_helper"
7 require "rspec/rails"
8
9 require "capybara/rspec"
10 require "capybara/rails"
11
12 Capybara.javascript_driver = :selenium
13 Category.delete_all; Category.create(:name => "Category")
14 Shoulda::Matchers.configure do |config|
15   config.integrate do |with|
16     with.test_framework :rspec
17     with.library :rails
18   end
19 end
20
21 # Add additional require lines here.
22 # Requires supporting files to run in this environment.
23 # spec/support/* and its subdirectories.
24 # run as spec files by default
25 # in spec.rb will load the files in this directory
26 # run twice: it will load the files in this directory

```

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# WHAT IS

# IEEE?

In 1963 the American Institute of Electrical Engineers (AIEE) founded by Thomas Alva Edison, Nikola Tesla, Elihu Thomson, Edwin J. Houston, and Edward Weston merged with Institute of Radio Engineers (IRE) to form the Institute of Electrical and Electronics Engineers (IEEE), the original goal of the AIEE was "to promote the Arts and Sciences connected with the production and utilization of electricity and the welfare of those employed in these Industries: by means of social intercourse, the reading

and discussion of professional papers and the circulation by means of publication among members and associates of information thus obtained", Now the IEEE is the world's largest association of technical professionals with more than 423,000 members around the world.

Technology is a crucial part of our life and our hope to a better future , it's involved in the growth and the sustainable development of every human activity on the planet , technology can help in solving

all types of challenges, starting from global warming to the small day to day issues we face , that's why our goal is to foster technological innovation and excellence for the benefit of humanity, and to reach this prime goal , we offer learning opportunities in the fields of engineering sciences, research, and technology as well as educational opportunities such as the IEEE e-Learning Library and research database.

We have 39 societies, each one focused on a certain knowledge area and Technical committees that help us provide specialized

publications, conferences, business networking and sometimes other services, all for the sake of creating technological progress and serving the professionals working on emerging and disruptive technologies , moreover the IEEE has established the IEEE Foundation in 1973 which is a charitable foundation that aims to support and promote technology education, innovation and excellence.

We as members of PUA SB believe that we can be a part of this mission to excel humanity's technological innovation.



Hello, my name is Brainy, the icon of IEEE PUA SB, and I'm here today to tell you about our history.

# 2019/2020 Board



**Ahmed Helmy**  
Chairman

**Muhannad Muhammad**  
Vice Chairman



**Khaled Abdelhalim**  
Treasurer

**Rawan Elnaggar**  
Secretary



It was founded in 2014, but let's start the story from the present, by the 6th board is the current one.

# 2019 / 2020 Events



**Zone X Digital  
Maharat min Google**  
April 3 on Fri at 6 PM

**IEEE PUA SB Recruitment'20**  
March 10 on Tue 12:30 PM



**Future X Program | Round 2**  
February 6 on Feb 6 - Feb 8



**Mid-Year Courses'20**  
February 1 on Feb 1 - Feb 20



They're making a great job until now  
and they made much events.



# 2019/2020 Events



**Blue Brain | AI Workshop**  
December 10 on Tue 12:30 PM

**ICT'19 Visit**  
December 2 on Mon 8 AM



**Future X Program**  
**IEEE PUA SB CAMP**  
October 31 on Oct 31- Nov 2



**IEEE PUA SB Recruitment'19**  
October 8 on Tue 12:30 PM





# 2018 / 2019 Board



**Mohamed Sobhy**  
Chairman



**Ayman Mohamed**  
Vice Chairman



**Ahmed Helmy**  
Secretary



**Hadeer Samy**  
Treasurer



They were a good board.

# 2018/2019 Events



**Mega Robot To Be 19**

April 9 on Mar 5- Apr 9

**IBM Digital Nation Africa  
Innovation Tour**

February 16 on Sat 8 AM



**Career SCOPE**

December 4 on Tue 12:30 PM

**IEEE PUA SB Recruitment '18**

October 9 on Tue 12:30 PM



# 2018/2019 Events

EED'18 Visit

September 15 on Sat 7 AM



They made some great events.



# 2017/2018 Board



**Nadeem Osama**  
Chairman



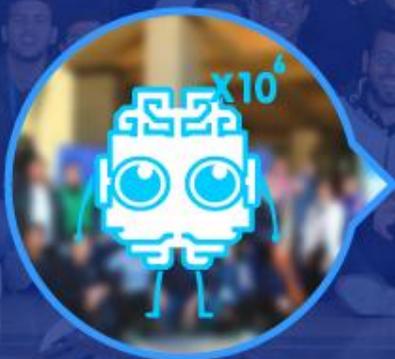
**Mohamed Sobhy**  
Vice Chairman



**Amr Ashraf**  
Treasurer



**Rana Ammaar**  
Secretary



The 4th board was the board who founded me.

# 2017 / 2018 Events



**MBB18 - Mega brain  
to be 18**

July 5 on Jul 5 - Jul 6

**Career Debate V2.0**

March 20 on Tue 12:30 PM



**Fundraising Workshop**

March 20 on Tue 12:30 PM



**Mid-Year Courses'18**

Jan 21 on Jan 31- Feb 20



# 2017/2018 Events



**The Black Seekers V2.0**  
October 31 on Tue 12:30 PM

**IEEE PUA SB Recruitment '17**  
October 17 on Tue 12:30 PM



They made many events too like.

# 2016/2017 Board



**Ahmed Tarek**  
Chairman



**Nada Refaat**  
Vice Chairman



**Amr Ashraf**  
Treasurer



**Nourhan Elyamany**  
Secretary



At the end of 2016, another board started the work.

# 2016/2017 Events



## Get Hired

May 9 on Tue 12:30 PM



## ASPPC Visit

May 10 on Thu 10:30 AM



## IEEE PUA SB Recruitment '17

March 21 on Tue 12:30 PM



## Career Debate

March 7 on Tue 12:30 PM



They made too valuable events like.



# 2016/2017 Events



## The Black Seekers

February 28 on Tue 12:30 PM



## Surrender the ME for the WE

November 22 on Tue 12:30 PM



## IEEE PUA SB Recruitment '17

October 18 on Tue 12:30 PM

## FOCUS - How to be a Photographer

October 11 on Tue 12:30 PM



## EED'16 Visit

September 6 on Tue 7 AM

# 2015/2016 Board



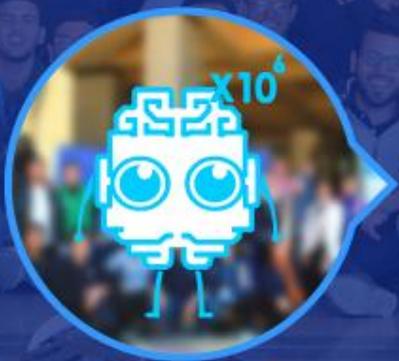
**Abdelrahman Nasr**  
Chairman

**Amr Ashraf**  
Vice Chairman



**Ahmed Abdelaim**  
Treasurer

**Mohamed salah**  
Secretary



◀ The 2nd board came was good too.

# 2015/2016 Events



**IEEE PUA SB Recruitment '16**  
April 19 on Apr 19- Apr 28

**Photoshop from Zero to Hero**  
March 1 on Mar 1- Mar 8



**Quantum Computer:  
The Next Big Thing**  
December 8 on Tue 12:30 PM



**IEEE DAY**  
November 24 on Tue 12:30 PM



# 2015/2016 Events



**IEEE PUA SB Recruitment '15**  
October 19 on Oct 19 - Oct 31

**EED'15 Visit**

August 31 on Mon 7:30 AM



**Soft Skills**

August 3 on Aug 3 - Aug 5



They made some great events.



# 2014/2015 Board



**Abdelrahman Elgedawi**  
Chairman

**Mohamed Rashed**  
Vice Chairman



**Abdelrahman Nasr**  
Treasurer



**Rewan Amr**  
Secretary



And the story of this branch started with the founding board.



# 2014/2015 Events

They had a great start as they made many events like:



**IEEE: SOLIDWORKS and ARDUINO**

March 24 on Tue 12 PM

**Web Development Workshop**

January 26 on Mon 10 AM



**KTH Scholarships & Programs**

December 28 on Sun 2 PM

**IEEE PUA SB Recruitment '14**

October 28 on Oct 28 - Oct 29



# 2014/2015 Events



**IEEE: Introduction To Robotics**  
September 7 on Sep 7- Sep 19

**EED'14 Visit**  
August 20 on Sun 8 AM



**Hacker: To be or not to be**  
August 18 on Aug 18- Sep 1



**Computer Day**  
June 3 on Tue 12 PM



# 2014/2015 Events



**IEEE: Mind-Mapping**  
April 8 on Tue 12 PM

**IEEE: Time Management & ICT**  
March 25 on Tue 12 PM



That was the story of our branch, that still has a long road towards success and of course the current board will make many things before the finish their work so I won't close the bracket and I'm waiting to see next boards.

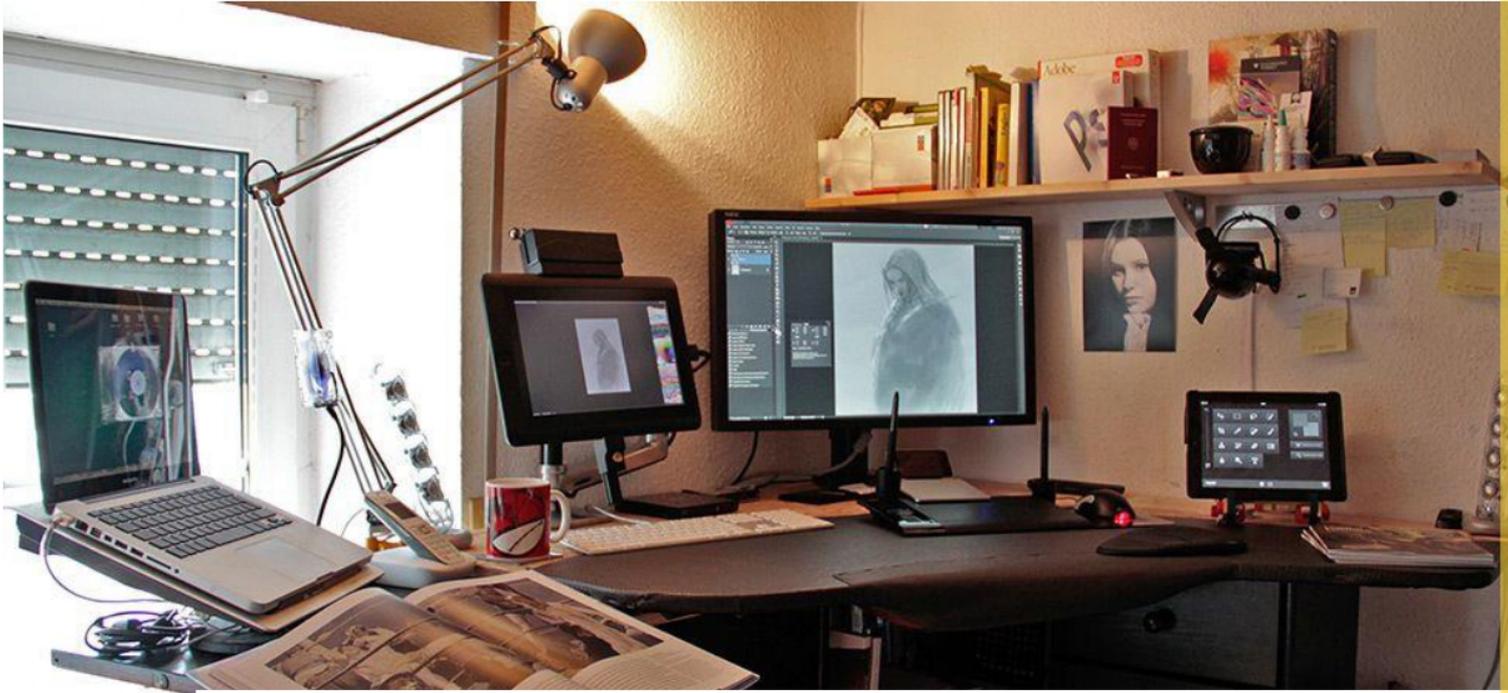


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# ARTSOLOGY

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DR.MOHAMED GABER
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# ARTISTIC TECHNOLOGY

**A**rt and Technology Is technology an art? The answer is, 'yes'! If any technology contains a skill, imagination, causes emotion, demonstrates the beauty, which is an art. On determining the art, what comes to a mind? Maybe, Picasso, Rodin, Dali? Okay, now consider Technology, and probably one will give up imagining smartphones or a computer. Art and Technology are a combined form of skills and innovative ideas. Art can be defined as the expression of artists

in the form of sculpture, paintings, dance, etc. to express their feelings to the viewers. It can either be emotional or creative.

Nowadays, Technology is the main effective tool that humans use for making glorious things as we all know art is a crucial part of any culture.

Technology has enhanced art through the main use of graphics, both computer and animation, the communication of it, and musically it

has enhanced the quality and distribution.

On an individual level, engaging with the arts helps people synthesize information and solve problems, often leading to innovative breakthroughs in science and technology. On a global level, the arts define the way in which technological advances shape the world around us. Over the past few decades, art & technology have become more intertwined than before, whether it's through providing new ways to mix different types of media, allowing more human interaction or simply making the process of creating it easier.

Digital technology and modern techniques have the strongest impact on the art of painting and drawing. In the past, painting and drawing were dependent on the artist's skills in wielding his traditional tools - the brush, the pencil, charcoal, or pastels.

The artist, through conventional and calculated steps, was in control of the

density of color, the degrees of shades, the realism, and abstraction of his work. Artists today, on the other hand, operate with mouse clicks, video tools, and digital colors.

Contemporary art has been considerably influenced by the rapid advancement in digital tech & by the astonishing progression in the introduction of new, more attractive & tougher materials that artist can work with, they have also allowed the contemporary artist to reduce time spent in the actual execution of artwork to a minimum thereby freeing them to focus more on contemplation creativity and cultivating groundbreaking concepts as well as sound preparation for artwork. Moreover, the internet is helping many contemporary artists display and sell their work through online exhibitions.

However, there are no limits for the human brain and technology, both art and technology define and reshape the world we live in, technology in art still challenges our perception of what creativity and science is all about.



# RISING

# COLORSPACE

**I**f you have an artistic eye and you believe

in the first impression, then you should know that many painting in famous art museums are made by Robots.

In a Serious trying to robotize everything, Michael Haas and Julian Adenauer created Rising Colorspace which is an abstract art installation made entirely by a finely turned Robot. The Robot they use in this artistic process called Vertwalker which is a lightweight robot built with 3D printed materials that can walk up vertical surfaces, it shown up first at Metropol-park in Berlin.

The patented robot, which looks like a Roomba, has a vacuum on its bottom with two computer fans, two wheels and has an Arduino-based custom electronic set up inside.

Depending on the specific Vertwalker, the robot holds a pen that uses acrylic to paint on a wall, and continuously overwrite itself. The duo artist from Berlin have been building robots that create works of art for a few years, and the current Vertwalker is the third generation with six active prototypes.

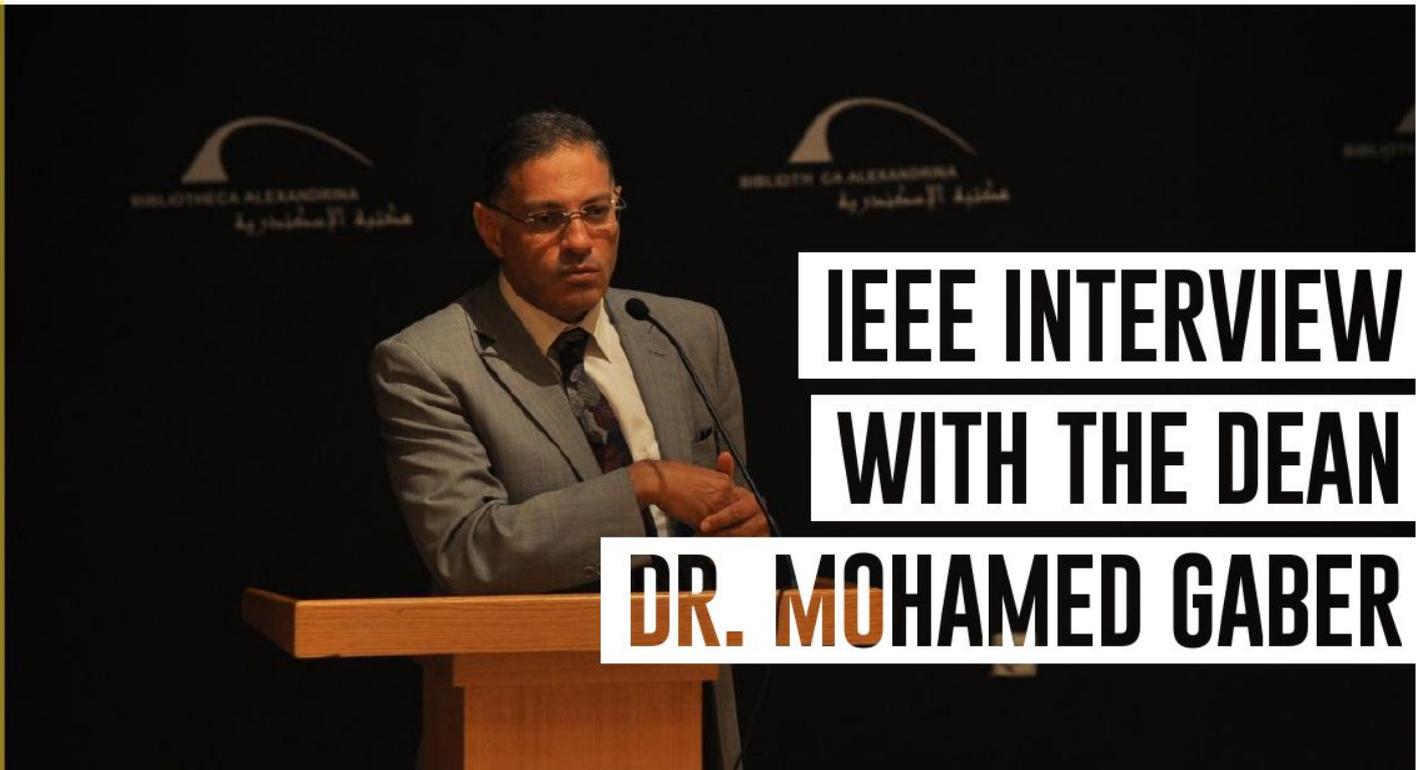
The Rising Colorspace has the robot programmed to move up a vertical line and then shift left or right to make a curve. The Sensing Colorspace has the robot move towards sounds, such as knocks on the wall it is on.

The Vertwalkers run for about two to three hours, after which someone at the installation has to change the battery and the pen it uses to paint.

The robots are used in the "Colorspace" series, displayed last year at the Staachi Gallery in London, which was the first "Emerging Colorspace".

The two installations are in Berlin, featuring the "Rising Colorspace and Sensing Colorspace, the first is located at Metropol-Park and the latter is at the 25hours Hotel Bikini Berlin.

If the abstract work of Rising Colorspace paintings doesn't seem fabulous at the first glance, come back the next day and it will look at least a little different. That's because the painting is always changing, just give it time and give yourself a chance.



## IEEE INTERVIEW

## WITH THE DEAN

## DR. MOHAMED GABER

- Professor of Industrial Engineering, Department of Production Engineering, Sept. 2003 – Present.
- Associate Professor, Department of Production Engineering, Sept. 98 – Aug 2003.

### 1. FIRST... TELL US ABOUT THE DEAN OF THE COLLEGE OF ENGINEERING THROUGHOUT HIS CAREER AND SCIENTIFIC LIFE

I got my bachelor's degree and Master degree from Production Engineering Department, Alexandria University in 1981 and 1987, respectively. I got my PhD from West of Scotland University, Scotland in 1992. My PhD was in the application of Artificial Intelligence in industry. On October 1981, I started my career as a Demonstrator in the Production Engineering Department, Alexandria University and became a Professor of industrial Engineering in August 2003.

I started my academic career as a Research fellow in West of Scotland University in 1993. In 1996, I was a senior consultant in Productivity and Quality Institute, Arab Academy for Science and Technology and Maritime Transport, Egypt. Then in 1997 I was an Assistant Professor in Industrial Engineering Department, College of Engineering King Abdul Aziz University, Saudi Arabia. After that in 2001 I was Senior lecturer (Acting Head of Department) in Mechanical and Industrial Engineering Department, Faculty of Engineering, Sohar University, Sultanate of Oman.

In 2008, I joined the Ministry of Higher Education and Scientific Research, Cairo, served as First-Under Secretary of State (Deputy Minister), Head of Cultural Affairs and Missions Sector. In 2011, I was nominated by the Minister of Higher Education the Cultural Counsellor and Director of Scientific Mission, at the Egyptian Embassy in Beijing, China. After my return for China on 2014, I became

Head of Production Engineering Department, Faculty of Engineering, Alexandria University. After that in 2015, I nominated the post of the Vice Dean for Education and Students Affairs, Faculty of Engineering, Alexandria University. Finally, from 2016 until this present day I am the Dean of Faculty of Engineering, Pharos University in Alexandria.

During my academic career I got a Scottish Higher Education Funding Council (SHEFC) Scholarship for Ph.D. degree at Paisley College of Technology, U.K. (under the auspices of the CNAAs), 1988-1992. On 1996, I won the Award for Scientific Research, (awarded for distinctive staff members who have potential and are active in research work), Alexandria University. Finally, on 2010 I received an Honorary Doctorate, for Services Provided in the Field of International Relations and Cooperation, from Baku State University, Azerbaijan.

I have more than 40 articles published in refereed international journals and international conferences in the field of Artificial Intelligence and Industrial Engineering and Management. I attended and participated in several national and international conferences/seminars/meetings.

## **2. TELL US ABOUT THE FACULTY OF ENGINEERING, PHAROS UNIVERSITY, FROM YOUR PERSONAL OPINION.**

In my opinion, Faculty of Engineering in Pharos University is establishing an outstanding learning environment with distinct and developed methods of teaching and learning. The Faculty grants Bachelor-Degrees in eight disciplines of Engineering to meet the requirements of the labor market. Our partnership and cooperation with the KTH in Sweden is, with no doubt, giving the Faculty of Engineering at Pharos University a competitive advantage. Throughout the by-annual visits, KTH is working closely to

enhance and upgrade our curriculums contents and teaching methods. Moreover, we have strong ties with many industrial institutes in Alexandria governorate. The cooperation with industry also contributes significantly in providing our students as well as our staff with knowledge and experiences related to real and practical problems.

The Faculty also seeks to establish post graduate studies in various disciplines, Diploma, and Masters Programs in addition to specialized professional diplomas.

The faculty embraces a group of extinguished faculty members, assistants, and technicians that work hard with dedication to provide excellent education and field training opportunities that provide practical skills and implements diverse student activities. The laboratories and workshops of the faculty contain advanced tools and equipment.

In Summary, Faculty of Engineering empowers students with a great sense of purposeful academic curiosity of the physical world and appreciation of the social and environmental context within a rapidly changing world.

## **3. ADVICE STUDENTS ON SUITABLE METHODS TO COMPLETE THEIR STUDY PROGRAMS UNDER THE CURRENT CIRCUMSTANCES**

- Allocate a suitable workspace at home that is safe, ergonomically sound, relatively quiet, and distraction free.
- Ensure a consistent internet connection at your home-based workspace.
- Ensure to be reachable and responsive throughout the agreed working hours
- Ensure to complete your assigned tasks within your best possible capacity, at the same rate as you would do in college, and in line with your department's approved

process and tasks timelines, within the limits of your home.

- Ensure to follow-up with your advisors on any issues that hinder your productivity while you are at your home-based workspace.

#### **4. IN YOUR OPINION, HOW DOES THE UNIVERSITY CONTRIBUTE AND SUPPORT STUDENTS DURING THE CORONA PANDEMIC CRISIS?**

No doubt this pandemic has been sudden to us and to the whole world. The greatest challenge is to convert from the conventional learning methods to e-learning especially that most of the courses here require adds on and experimental work. In addition, converting a course for online delivery is time-consuming work. We made a great effort in guiding and training our faculty members on using online tools and teaching methods whilst maintaining the learning outcomes of the course. There is a tight follow up with our staff and continuous orientation on how to deal with any issues they are facing.

There are several surveys and feedbacks sent to students and faculty members to continuously enhance the teaching methods to meet the requirements and maintain the objective learning outcomes.

We expect that even after this pandemic is over some of the courses will incorporate some of the online tools that are being used now along with the conventional methods. This can be an opportunity to transform education to meet the needs of the next generation of students and become technology-enabled education.

#### **5. WHAT IS YOUR PLAN TO ADAPT TO THE JOB MARKET?**

- It has been 5 years since implementing the current curriculum. Therefore, in the vision of 2030, the Ministry of Higher Education is encouraging universities to upgrade the current curriculum to serve the future requirements of the job market. We are working on designing a new curriculum to include updated programs to meet the demand of a technology-enhanced learning that can keep up with the continuous workforce growth.
- In order to accomplish such vision, we assigned a committee from different industries to give us an insight on the current workforce requirements and meet the expectations from the potential graduates.
- The new curriculums will be designed in accordance to the Ministry of higher education guidelines published in March 2020.

#### **6. PROVIDE A WORD DESCRIBING THE PERFORMANCE OF STUDENTS IN PREVIOUS YEARS IN THE STUDENT BRANCH AND ADVICE FOR THE COMING YEARS**

The last four years in the Faculty of Engineering witnessed a radical change in its students' activities and participation in various activities. In fact, I encouraged the students to volunteer in their own activities and form their own boards. Currently, we have more than 5 different students' branches in the Faculty that develops the students both personally and scientifically. I believe that the impact of such volunteer activities will enhance their development both academically and socially.

#### **7. WHAT DO YOU THINK OF THE ROV COMPETITION AND THE SESSIONS OFFERED TO PREPARE STUDENTS FOR**

## **PARTICIPATION AS THE FIRST STEP OF ITS KIND IN OUR FACULTY?**

We have an ambitious program where an innovation club was created that includes all the talented students to work together from different departments. ROV is one of the extensive competitions carried out in this club, this competition enhances the collaboration of students in engineering from different departments and enhances the teamwork.

## **8. GIVE ADVICE TO THE NEWLY OPENED STUDENT CHAPTER IEEE ROBOTICS AND AUTOMATION SOCIETY "I" AT THE UNIVERSITY AND HOW IT CAN BE A LINK AND INTEGRATION BETWEEN THE DIFFERENT DEPARTMENTS OF THE FACULTY OF ENGINEERING**

My advice to the students is to form team boards of students that are good at voluntary work. The projects should have specific short term, achievable, and feasible goals in order to feel the impact of such projects. The students should learn from other branches and share their experiences. In fact, I am impressed with the students' activities of the IEEE branch so far.

## **9. HOW WOULD YOU HANDLE CONFLICTS BETWEEN STUDENTS AND INSTITUTION ADMINISTRATORS?**

Firstly, I do not like the term "conflict". Actually, Pharos University administrators are always supportive. However, in some occasions they put some constraints or requesting more detailed information about the students' branches activities or events. In this case I send to the University administrators the requested information and

clarify the issue. Therefore, by aligning the objectives and setting clear goals things should go smoothly.

## **10. HOW WOULD YOU MANAGE YOUR TIME AND ESTABLISH PRIORITIES?**

In all my past years, effectively and efficiently managing my time has been my number one target. I set my priorities depending on the importance of the tasks ahead. I believe that planning ahead is the most critical part of time management. Finally, I revise and question myself on a daily basis to see how to do better next time.

## **11. WHAT IS YOUR METHOD FOR DEALING WITH WEAK STUDENTS?**

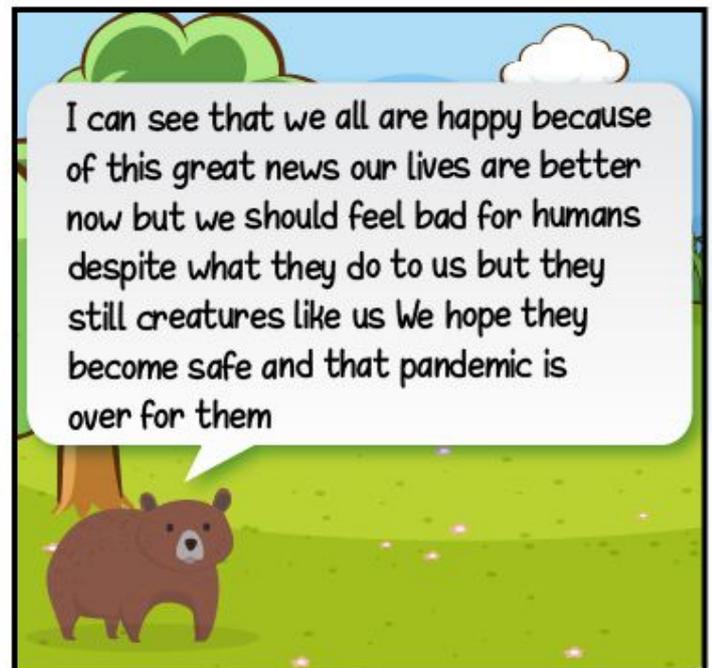
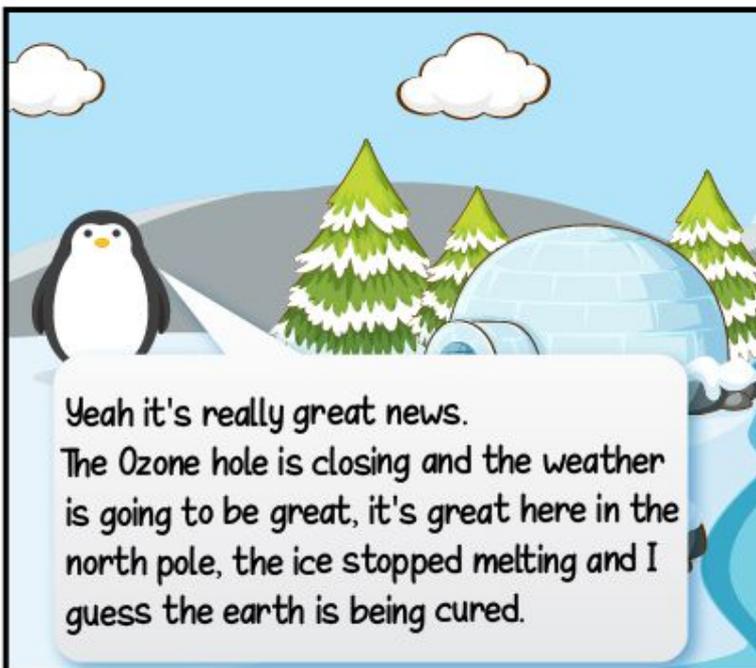
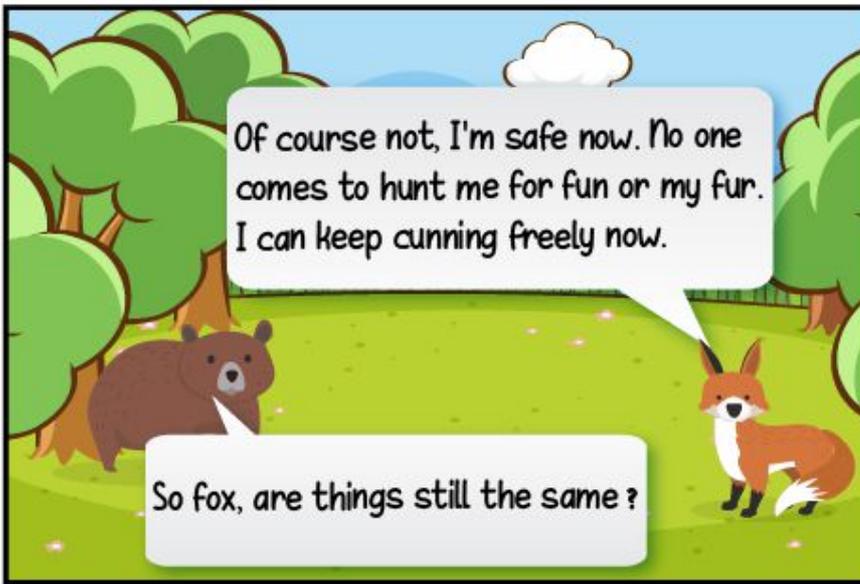
We have a clear mechanism for dealing with weak students. This is adopted by the university and enhanced by the faculty. There is a very close follow-up with academic advisors with these students and we ask those advisors to constantly meet up with these students individually and listen to their problems, whether, the issue is from the content of the course it self , or from the teaching methods, or if it was a personal problem. Then we try to provide them with other opportunities by increasing the office hour times and involving them more in other activities to motivate them and encourage them. The advisors closely monitor their performances and give them continuous feedback.

## **12. WHAT IS YOUR DEFINITION OF EXCELLENCE?**

When we talk about excellence while we are engineers, we have to talk about how to be excellent in engineering. The decisions of an excellent engineer should be economically feasible, efficient, and effective.







# 2

# CYBERNETICS

## C O N T E N T

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MOHAMED A. ABLOUHASSAN



# BIG DATA

The value of things doesn't depend on their size. There are a lot of things like microchips that are too small, yet too valuable and expensive.

Let's take big data as an example, it's not called like that because the data are large in the size, but it is called like that due to its precious value.

Big data is a group of structured, semi-structured, and unstructured data collected by organizations that can be mined for information and used in machine learning projects, predictive modeling, and other advanced analytics applications.

Big data is difficult or maybe impossible to process using traditional methods. And it has one or more of the following characteristics: high volume, high velocity or high variety.

Nowadays, many technological applications like mobile phones, AI (Artificial Intelligence), social and The Internet of Things (IoT) drive data complexity through new forms and sources of data and generate much of it in real-time and at a very large scale.

### **The History of Big Data :**

The term 'Big Data' has been used since the early 1990s. Most people credit John R. Mashey (who used to work at Silicon Graphics) for making the term popular.

Over the centuries, people have been trying to use data analysis and analytical

techniques to support their decision-making processes.

The ancient Egyptians tried to capture all existing knowledge or data in Bibliotheca Alexandrina. The Romans used to carefully analyze the statistics of their military to determine the optimal distribution for their armies.

However, in the last two decades, the volume and speed with how big data is generated have changed – beyond the capacities of human comprehension. The total amount of data in the world reached 4.4 zettabytes in 2013. That is set to rise steeply to 44 zettabytes by 2020. To put that in perspective, 44 zettabytes is equivalent to 44 trillion gigabytes. Even with the most advanced technologies today, it is impossible to analyze all this data. The need to process these increasingly larger (and unstructured) data sets is how traditional data analysis transformed into 'Big Data' in the last decade.

To illustrate this development over time, the evolution of Big Data can roughly be subdivided into three main phases. Each phase has its characteristics and capabilities. To understand the context of Big Data today, it is important to understand how each phase contributed to the contemporary meaning of Big Data.

### 1. Big Data phase 1.0:

Data analysis, data analytics, and Big Data originate from the longstanding domain of database management. It relies heavily on

the storage, extraction, and optimization techniques that are common

in data that is stored in Relational Database Management Systems (RDBMS).

Database management and data warehousing are considered the core components of Big Data Phase 1. It provides the foundation of modern data analysis as we know it today, using well-known techniques such as database queries, online analytical processing, and standard reporting tools.

### 2. Big Data phase 2.0:

Since the early 2000s, the Internet and the Web began to offer unique data collections and data analysis opportunities. With the expansion of web traffic and online stores, companies such as Yahoo, Amazon, and eBay started to analyze customer behavior by analyzing click-rates, IP-specific location data, and search logs. This opened a whole new world of possibilities.

From the data analysis, data analytics, and Big Data point of view, HTTP-based web traffic introduced a massive increase in semi-structured and unstructured data. Besides the standard structured data types, organizations now needed to find new approaches and storage solutions to deal with these new data types to analyze them effectively. The arrival and growth of social media data greatly aggravated the need for tools, technologies, and analytics techniques that we're able to extract meaningful information out of this unstructured data.

### 3. Big Data phase 3.0:

Although web-based unstructured content is still the main focus for many organizations in data analysis, data analytics, and big data, the current possibilities to retrieve valuable information are emerging out of mobile devices.

Mobile devices not only give the possibility to analyze behavioral data (such as clicks and search queries) but also give the possibility to store and analyze location-based data (GPS-data). With the advancement of these mobile devices, it is possible to track movement, analyze physical behavior, and even health-related data (number of steps you take per day). This data provides a whole new range of opportunities, from transportation to city design and health care.

Simultaneously, the rise of sensor-based internet-enabled devices is increasing the data generation like never before. Famously coined as the 'Internet of Things' (IoT), millions of TVs, thermostats, wearables, and even refrigerators are now generating zettabytes of data every day. And the race to extract meaningful and valuable information out of these new data sources has only just begun.

#### **The importance of big data :**

Big data has a lot of potentials. You can use the valuable insights that this data provides for making marketing decisions about your product and brand. Brands

that are utilizing Big Data can make faster and more informed business decisions. Using all the information you have for your customers, you can make your product more customer-centric and create the content that your customer wants or personalize their journeys.

Big data is important in all these fields :

1. Product Development
2. Comparative analysis
3. Customer Experience
4. Machine Learning
5. Scalability and predicting failures
6. Fraud and Compliance

#### **Types of big data :**

1. Structured data is fixed-format and frequently numeric. So, in most cases, it is something that is handled by machines and not humans. This type of data consists of information already managed by the organization in databases and spreadsheets stored in SQL databases, data lakes, and data warehouses.

2. Unstructured data is information that is unorganized and does not fall into a predetermined format because it can be almost anything. For example, it includes data gathered from social media sources and it can be put into text document files held in Hadoop like clusters or NoSQL systems.

3. Semi-structured data can contain both the forms of data such as web server logs or data from sensors that you have set up. To be precise, it refers to the data

that, although has not been classified under a particular repository (database), still contains vital information or tags that segregate individual elements within the data.

### **How it works :**

#### **1. Integration**

Big Data is always collected from many sources and as we are speaking for enormous loads of information, new strategies, and technologies to handle it need to be discovered. In some cases, we are talking for petabytes of information

flowing into your system, so it will be a challenge to integrate such volume of information into your system. You will have to receive the data, process it, and format it in the right form that your business needs and that your customers can understand.

#### **2. Management**

What else might you need for such a large volume of information? You will need a place to store it. Your storage solution can be in the cloud, on-premises,

or both. You can also choose in what form your data will be stored, so you can have it available in real-time on-demand. This is why more and more people are choosing a cloud solution for storage because it supports your current compute requirements.

#### **3. Analysis**

Okay, you have the data received and stored, but you need to analyze it so you can use it. Explore your data and use it to make any important decisions such as knowing what features are mostly researched from your customers or use it to share research. Do whatever you want and need with it – put it to work, because you did big investments to have this infrastructure set up, so you need to use it.

We may consider big data as an important part of the future but the fact is it may be the future itself. The way that businesses, organizations, and the IT professionals who support them approach their missions will continue to be shaped by evolutions in how we store, move, and understand data.



# WHY SPACE?!

**H**umans have a lot of

fears, and as a result, we do our best to find solutions to beat our fear. One of our biggest fears is the end of the earth, that we could go extinct because of our inability to protect the planet, so we started thinking about what is there beyond those blue skies? how can we go above? can we breathe there? Are there habitable planets like earth?

Those were some of many questions that were in our heads, and we did succeed in answering many of those questions, because of our survival instincts; We started inventing machines, telescopes, space suits, rockets, and anything that

can help us in space exploration. But what exactly is the definition of Space exploration?

Space exploration is the use of astronomy and space technology to explore outer space. While the study of space is carried out mainly by astronomers with telescopes, its physical exploration though is conducted both by unmanned robotic space probes and human spaceflight.

Space exploration started in the latter half of the 20th century, rockets were developed that were powerful enough to overcome the force of gravity to reach orbital velocities, paving the way for

space exploration to become a reality.

In the 1930s and 1940s, Nazi Germany saw the possibilities of using long-distance rockets as weapons. Late in World War II, London was attacked by 200-mile-range V-2 missiles, which arched 60 miles high over the English Channel at more than 3,500 miles per hour. After World War II, the United States and the Soviet Union created their missile programs.

On Oct. 4, 1957, the Soviets launched the first artificial satellite, Sputnik 1, into space. Four years later on April 12, 1961, Russian Lt. Yuri Gagarin became the first human to orbit Earth in Vostok 1. His flight lasted 108



minutes, and Gagarin reached an altitude of 327 kilometers (about 202 miles).

The first U.S. satellite, Explorer 1, went into orbit on Jan 1958. And In 1961 Alan Shepard became the first American to fly into space.

1969 and the first moon landing

Commander Neil Armstrong and lunar module pilot Buzz Aldrin formed the American crew that landed the Apollo Lunar Module Eagle on July 20, 1969, at 20:17 UTC. Armstrong became the first person to step onto the lunar surface six hours and 39 minutes later on July 21 at 02:56 UTC; Aldrin joined him 19 minutes later. They spent about two and a quarter hours together outside the spacecraft, and they collected 47.5 pounds (21.5 kg) of lunar material to bring back to Earth.

Command module pilot Michael Collins flew the Command Module Columbia alone in lunar orbit while they were on the Moon's surface. Armstrong and Aldrin spent 21 hours, 36 minutes on the lunar surface at a site they named Tranquility Base before lifting off to rejoin Columbia in lunar orbit.

Following Apollo 4 different types of space exploration missions were conducted which were:

### 1. Flyby Space Missions:

A flyby is a path a spacecraft follows past a planet or other body in space to get information about it. In a flyby, the spacecraft passes close but isn't "captured" into an orbit by gravity. During a flyby, a spacecraft must use its instruments to observe the target as it passes, changing the aim of the instruments as it passes. The spacecraft must downlink data at high rates to Earth, storing data onboard when it can't send it down.

A spacecraft in a flyby has a limited opportunity to gather information. Once it has flown to its target, it cannot return. Flyby operations are planned years of the encounter and refined and practiced in the months before the encounter date.

Sometimes the scientists and engineers in charge of the flight cannot tell how close the ship will be to the object it is flying by until it is very close. Since what the ship does will depend on how far it is from the object, different sequences of commands are prepared by the flight team to carry out operations in various phases of the flyby, depending on the spacecraft's distance from its target.

### 2. Orbiter Space Missions:

Unlike a flyby spacecraft, an orbiter spacecraft is a type of spacecraft that enters and stays in orbit around a planet, taking pictures and videos, measuring distances, using heat sensors to see if there's any alien life, and collecting other data.

Anyways, the advantage of an orbiter is that you can collect a lot more data and get more detailed information about the planet/moon.

A disadvantage is that you can't land the orbiter onto the surface of the planet to conduct some more serious scientific experiments.

### 3. Rover Space Exploration Missions:

A rover is a planetary surface exploration device designed to move across the solid surface on a planet or other planetary-mass celestial bodies. Some rovers have been designed as land vehicles to transport members of a human spaceflight crew; others have been partially or fully autonomous robots. Rovers are typically created to land on another planet (other than Earth) via a lander-style spacecraft, tasked to collect information about the terrain and to take crust samples such as dust, soil, rocks, and even liquids.

They are essential tools in space exploration.

#### 4. Human Space Exploration Missions:

Human spaceflight is space travel with a crew or passengers aboard the spacecraft. Spacecraft carrying people may be operated directly, by the human crew, or it may be either remotely operated from ground stations on Earth or be autonomous, able to carry out a specific mission with no human involvement.

#### Future Space Missions:

##### Mars 2020 rover

Curiosity rover has been a huge success. After landing on Mars in 2012, the rover has lasted much longer than the original design life and has traveled farther on Mars than any robot before it. The next step is the as-yet-unnamed Mars 2020 rover. As the placeholder name implies, NASA wants to launch this mission in 2020. The rover will be based on the incredibly successful design of Curiosity, but the instruments it takes along for the ride will be vastly improved.

Mars 2020 rover will be equipped to investigate the geology of Mars to detect the

signs of past (or present) life on the Red Planet. It will use Raman Spectroscopy and x-ray lithochemistry to identify elemental components and organic materials on Mars with much more sensitivity than Curiosity can. It may also carry an experiment to produce breathable oxygen from Mars' predominantly carbon dioxide atmosphere. This could have major implications for future manned missions.

##### 2. James Webb Space Telescope launch

NASA has completed the construction of the hardware and is currently testing it on the ground. It has also asked astronomers to begin submitting proposals for time on the telescope after it's online. This telescope will be much more powerful than Hubble, which has a mere 48 square feet of the reflective surface compared with JWST's 270 square feet.

The James Webb Space Telescope will be able to see further into the infrared than Hubble, meaning it can study objects that are obscured by dust or gas. To avoid contaminating heat, the telescope will be placed in the L2 Lagrange point with the Earth permanently between the telescope and

the sun. The launch is currently on track for October of 2018.

##### 3. SpaceX Dragon 2 crewed flight

SpaceX is one of two companies currently participating in NASA's Commercial Crew Program, the other being Boeing. There's nothing wrong with Boeing's plans, but SpaceX has a lot more interesting new technology in the crewed version of the Dragon capsule. Like the current cargo Dragon, the Dragon 2 capsule will be launched by a Falcon 9 rocket that can land back on Earth after sending the second stage into space.

Dragon 2 will have space for seven astronauts, and NASA has already contracted for six crewed flights to the ISS. The next few years will include milestones for the Dragon 2 — the one to watch is in May of 2018. That's when the Dragon 2 will ferry two astronauts up to the ISS, marking the first time humans have ridden an American spacecraft since the Space Shuttle was retired.

In the end, we still don't know why we chose space as an alternative for earth?! why don't we try to keep our environment safe from pollution and help our planet to be last.



# ELECTRONIC FIREFIGHTER

**T**here are no doubts that

the firefighters are playing a great role in our life .. they save people from being dead and buildings from being damaged even cities from perishing. But firefighting is from the most dangerous jobs in the world as firefighters are exposed to dangerous situations and their lives are at risk. So the world is directed to make a machine be able to extinguish the fires and save those superheroes lives,

this machine was Fire Extinguisher Robot.

- Fire Extinguisher Robot is a Hardware-based model used to automatically extinguish the fire during fire accidents.

The Robot shield is coated with calcium silicate boards that are capable of withstanding very high

temperatures. The principle used, was designed and experimented at a temperature of 300°C.

- They are designed with certain tasks in mind. These include analyzing and locating

fires, conducting search and rescue, monitoring hazardous variables, and the primary

task of fire control and suppression. Fixed firefighting robotic systems, like automatic

fire sprinklers and alarms, are used in heavily populated and hazardous areas for

rapidly extinguishing any threat. These are usually simpler systems relying mostly on

UV or IR sensors and, as the name suggests, are fixed.

- Mobile robotic firefighting systems are another type, mostly in the form of remote-controlled

vehicles affixed with fire suppression tools like water or

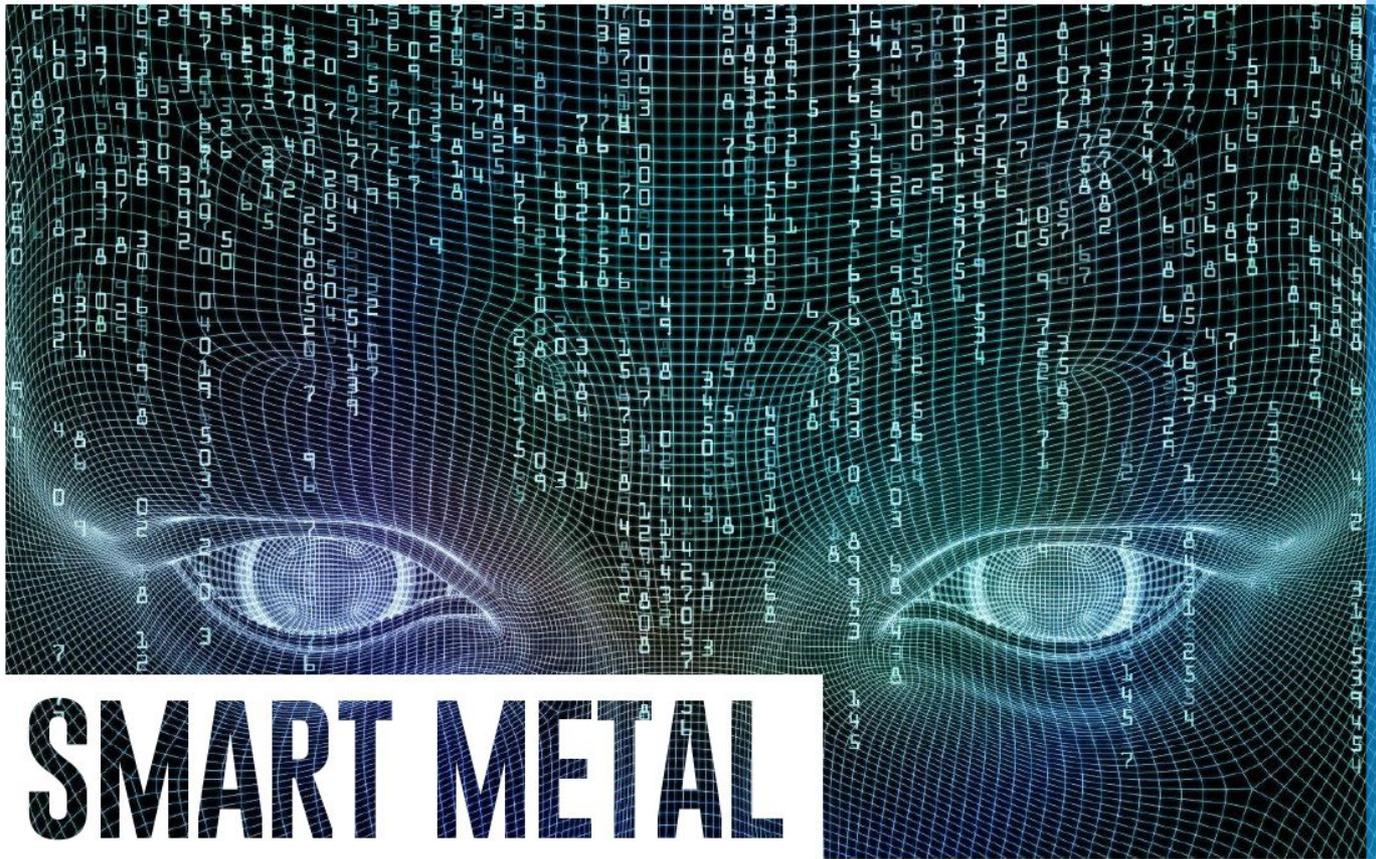
foam hoses. These are capable of traveling into areas unsafe for people through an array of sensors, visual camera, IR, and

more technology that transmits information for navigation to a remote operator. Safety

professionals and engineers are even experimenting with aerial robotics like drones for added situational awareness, and close-quarters indoor robots that can eliminate fires at close range.

- One of the hugest fires that occur in the world was Australia fires which were fought by

thousands of firefighters who have controlled the situation but after enormous losses, helicopters were trying to put the fire off too. They took a lot of time and many victims were lost. In this situation the best solution is using a fire extinguisher robot, to have fewer losses and a minimum number of victims



# SMART METAL

Over the years, technology has revolutionized our world and daily lives. Technology has created amazing tools and resources. Modern technology has paved the way for multi-functional devices like the smartwatch and the smartphone. sputters are increasingly faster, more portable, and higher-powered than ever before. With all of these revolutions, technology has also made our lives easier, faster, better, and more fun.

Artificial intelligence (AI) makes it possible for machines to learn from experience, adjust to new inputs, and perform human-like tasks. Most AI examples that you hear about today like self-driving cars rely heavily on deep learning and natural language processing.

The term artificial intelligence was coined in 1956, but AI became more popular today thanks to increased data volumes, advanced

algorithms, and improvements in computing power and storage.

Artificial intelligence tries to mimic (and surpass) the power of the human brain using machines. "Machine learning" is another common term in AI.

**The primary goals of artificial intelligence are:**

- \*Speed up repetitive procedures by using robots or machines instead of humans.
- \*Out-smart human brains through "learning" and memory.
- \*Recognize patterns and make decisions instantly and efficiently.

ML or Machine Learning is a method of data analysis that automates analytical model building. It is a branch of artificial intelligence based on the idea that systems can learn from data, identify patterns, and make decisions with minimal human intervention.

The starting point for your architecture should always be your business requirements and wider company goals. You need to understand your constraints, what value you are creating, and for whom.

The focus of the field is learning, that is, acquiring skills or knowledge from experience. Most commonly, this means synthesizing useful concepts from historical data. As such, there are many different types of learning that you may encounter as a practitioner in the field of machine learning: from whole fields of study to specific techniques.

### There are 3 types:

#### 1. Unsupervised Learning:

There is no need to have any target or outcome variable to predict or estimate. It is used for the clustering population in different groups, which is widely used for segmenting customers in different groups for specific intervention. Example of Unsupervised Learning: Apriori algorithm.

#### 2. Supervised Learning:

This algorithm consists of a target/outcome variable (or dependent variable) which is to be predicted from a given set of predictors (independent variables). Using these sets of variables, we generate a function that map inputs to desired outputs. The training process continues until the model achieves a desired level of accuracy on the training data. Examples of Supervised Learning: Regression, Decision.

#### 3. Reinforcement Learning:

By using this algorithm, the machine is trained to make specific decisions. The machine is exposed to an environment where it trains itself continually using trial and error. This

machine learns from past experiences and tries to capture the best possible knowledge to make accurate business decisions. Example of Reinforcement Learning: Markov Decision Process.

If you are planning to develop effective machine learning systems for augmenting your business, it takes:

- A) Superior data preparation capabilities
- B) Knowledge of basic and advanced algorithms
- Scalability
- C) Automation and iterative processes
- D) Knowledge of ensemble modeling

### ML has a lot of applications in a lot of sectors like:

**A) Financial services:** by identifying the main ideas in the financial statements and determining the appropriate investment opportunities in addition to preventing any fraud and taking the necessary measures at the appropriate time.

**B) Marketing and sales:** by analyzing the customer's purchase history and providing product recommendations for the next purchase, this increases the chances of success in the future.

**C) Healthcare:** by the appearance of wearable sensors, the data is used to access the patient's health in real-time and provides information about the condition such as heartbeat and blood pressure. This information can be used to diagnose the condition and treat it more easily and to predict the occurrence of diseases.

And of course, we have to keep pace with the progress of technology so that we can catch up with developed countries.



# RED OR BLUE?

**S**ecurity is considered one of the most important things in humanity, because it ensures our safety and survival; But the world has changed and became more technological, so humans invented a new way to secure their information and data online which is called **Cyber Security**.

**Cyber Security** is the practice of defending computers, servers, mobile devices, electronic systems, networks, and data from malicious attacks. It's also known as information technology security or electronic information security and it can divide into a few common categories:

- **Network Security** is the practice of securing a computer network from intruders, whether targeted attackers or opportunistic malware.
- **Application Security** focuses on keeping software and devices free of threats. A

compromised application could provide access to the data it is designed to protect. Successful security begins in the design stage, well before a program or device is deployed.

- **Information Security** protects the integrity and privacy of knowledge, each in storage and transit.
- **Operational Security** includes the processes and selections for handling and protecting information assets. The permissions users have once they access a network and also the procedures that confirm whether the information has been kept or shared all represent this umbrella.
- **Disaster recovery and business continuity** define however a company responds to a cyber-security incident or the other event that causes the loss of operations or information. Disaster recovery policies dictate however the organization restores its operations and

knowledge to come back to identical operational capability as before the event. Business continuity is that the organization falls back on whereas attempting to work while not bound resources.

- **End-user Education** addresses the foremost unpredictable cyber-security factor: individuals. Anyone will accidentally introduce a virulent disease to associate degree otherwise secure system by failing to follow smart security practices.

Teaching users to delete suspicious email attachments, not connect unidentified USB drives, and numerous alternative vital lessons are significant for the safety of any organization.

Although cybersecurity has some fields in it, there only two teams who work in it and they are The Red Team and The Blue Team.

**Red teams** focus on penetration testing of different systems and their levels of security programs. They are there to detect, prevent, and eliminate vulnerabilities.

A red team imitates real-world attacks that can hit a company or an organization, and they perform all the necessary steps that attackers would use. By assuming the role of an attacker, they show organizations what could be backdoors or exploitable vulnerabilities that pose a threat to their cybersecurity.

The techniques a red team uses vary from standard phishing attempts aimed at employees and social engineering to impersonate employees to obtain admin access. To be truly effective, red teams need to know all the tactics, techniques, and procedures an attacker would use.

Red teams offer critical benefits, including a better understanding of possible data exploitation and the prevention of future breaches. By simulating cyber-attacks and, companies make sure their security is up to par with the proper defenses in place.

**Blue teams** are similar to red ones in that it also assesses network security and identifies any possible vulnerabilities.

But what makes a blue team different is that once a red team imitates an attacker and attacks with characteristic tactics and techniques, a blue team is there to find ways to defend, change and re-group defense mechanisms to make the incident response much stronger.

Like a red team, a blue team needs to be aware of the same malicious tactics, techniques, and procedures to build response strategies around them. And blue team activity isn't exclusive to attacks. They're continuously involved to strengthen the entire digital security infrastructure, using software like an IDS (intrusion detection system) that provides them with an ongoing analysis of unusual and suspicious activity.

### Types of cyber threats

The threats countered by cyber-security are three-fold:

- **Cybercrime:** includes single actors or groups targeting systems for financial gain or to cause disruption.
- **Cyber-attack:** often involves politically motivated information gathering.
- **Cyberterrorism:** is intended to undermine electronic systems to cause panic or fear.

So, how do malicious actors gain control of computer systems? Here are some common methods used to threaten cyber-security:

- **Malware:** Malware means malicious software. One of the most common cyber threats, malware is software that a cybercriminal or hacker has created to disrupt or damage a legitimate user's computer. Often spread via an unsolicited email attachment or legitimate-looking download, malware may be used by cybercriminals to make money or in politically motivated cyber-attacks.

### There are several different types of malware, including:

- **Virus:** A self-replicating program that attaches itself to a clean file and spreads throughout a computer system, infecting files with malicious code.

- **Trojans:** A type of malware that is disguised as legitimate software. Cybercriminals trick users into uploading Trojans onto their computers where they cause damage or collect data.
- **Spyware:** A program that secretly records what a user does, so that cybercriminals can make use of this information. For example, spyware could capture credit card details.
- **Ransomware:** Malware that locks down a user's files and data, with the threat of erasing it unless a ransom is paid.
- **Adware:** Advertising software which can be used to spread malware.
- **Botnets:** Networks of malware-infected computers that cybercriminals use to perform tasks online without the user's permission.

### SQL injection

An SQL (structured language query) injection could be a form of cyber-attack wont to take charge of and steal knowledge from info. Cybercriminals exploit vulnerabilities in data-driven applications to insert malicious code into a database via a malicious SQL statement. this provides them access to the sensitive info contained within the info.

### Phishing

Phishing is once cybercriminals target victims with emails that seem to be from a legitimate company inquiring for sensitive info. Phishing attacks area unit usually wont to dupe folks into turning in Mastercard knowledge and alternative personal info.

### Man-in-the-middle attack

A man-in-the-middle attack could be a form of cyber threat wherever a cybercriminal intercepts communication between 2 people to steal knowledge. for instance, on AN

unsecured wireless fidelity network, AN aggressor may intercept knowledge being passed from the victim's device and also the network.

### Denial-of-service attack

A denial-of-service attack is wherever cybercriminals stop a system from fulfilling legitimate requests by overwhelming the networks and servers with traffic. This renders the system unusable, preventing a company from winding up very important functions.

### Cybersafety tips - defend yourself against cyberattacks:

However will businesses and people guard against cyber threats? Here area unit our prime cyber safety tips:

1. Update your computer code and in operation system: this implies you take pleasure in the most recent security patches.
2. Use anti-virus software: Security solutions like Kaspersky Total Security can sight and removes threats. Keep your computer code updated for the most effective level of protection.
3. Use robust passwords: guarantee your passwords don't seem to be simply guessable.
4. don't open email attachments from unknown senders: These might be infected with malware.
5. don't click on links in emails from unknown senders or unacquainted websites: This is a way for malware to unfold.
6. Avoid exploitation of unsecured wireless fidelity networks publicly places: Unsecure networks leave you prone to man-in-the-middle attacks





**TALK WITH**

**DR. MOHAMED**

**A. ABOULHASSAN**

Received his B.S. degree from Alexandria University in Telecommunications engineering in 2003, and his M.S. and Ph.D. degrees in wireless communication from Alexandria University in 2009 and 2014, respectively. From 2005 to 2010, he was a project manager at Huawei Technologies In Egypt. From 2014 until now, he is working as an assistant professor in Pharos University. His main interests include next generation RAN evolution, wireless resource management, Massive MIMO technologies, and IoT. He has been working as a consultant in several telecommunication companies. He has also involved in teaching several soft skills courses.

**1. A WORD DESCRIBING THE PERFORMANCE OF STUDENTS IN PREVIOUS YEARS IN THE STUDENT BRANCH AND ADVICE FOR THE COMING YEARS.**

The performance of IEEE SB members is Pharos is amazing. They are very active and energetic. They have already organized several mega events, invited multinational companies to give workshops to our

students in addition to their continuous weekly events.

I advice them to continue their significant efforts in focusing on students' need, enable them to be familiar with new technologies and practical applications

**2. WHAT DAILY ACTIVITIES DO YOU THINK ACTIVITIES SUPERVISOR PERFORM?**

Since the branch is very active, they almost organize an event every week, thus as a supervisor, I have to sign several documents every week. Also

sometimes, I have to make some phone calls if there some urgent need special arrangements. Also I like to attend some of their meetings to know the team members more closely and feel the effort they pay.

### **3. HOW WOULD YOU ENSURE THAT STUDENTS ACHIEVE THEIR GOALS? HOW WOULD YOU TRACK THEIR PROGRESS IN THE STUDENT BRANCH?**

Normally, at the beginning of each semester, the board sends me a report about the achieved activities and their future plan. Also, after each special event, they send me a feedback about the outcomes of the event such as number of attendees, students reactions, ...etc.

### **4. IF YOU SAW THAT A STUDENT'S ACADEMIC PERFORMANCE WAS SLIPPING, HOW WOULD YOU APPROACH THE PROBLEM?**

This problem sometimes occurs where an attendance conflict exists between an activity in the branch and an academic activity. Normally I can contact the Staff member to give the student an exception. Staff members are very considerate , however such

expectations mainly includes attendance issues which the student can overcome after that. We are keen in the branch that our students delivery completely all their academic assignments and tasks.

### **5. WHICH RESOURCES WOULD YOU USE TO HANDLE STUDENT ISSUES IN THE UNIVERSITY, NOT JUST IEEE SB?**

Most of the problems that our students face are academic. For example, courses registration is one of the major problems that need a continuous follow up in order the student can graduate on time. Also, attendance problems (which we find that students are guilty at the end), overlapped time tables are also very common. Very few problems occurs which are related to cooperation between TAs and students. Personal problems are very rare in our university.

### **6. DO YOU FIND THE STUDENT BRANCH EFFORTS EFFECTIVE DURING THE CORONA PANDEMIC CRISIS?**

I believe that the branch plays an important role in such difficult time. It has organized several valuable online workshops and seminars. Also, they have applied for some national and multinational competitions, finding alternative ways for documents that need life signatures.



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INFORMATION



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# MEDICORUM

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## A NEW WAY OF USING WHAT WE ALREADY KNOW

Since their invention warfare equipment and drones have used globally for different reasons like used in Filmmaking, remote sensing, oil and gas exploration, and surveillance. But their benefit to us humans most certainly did not stop there, for we are seeing a wide and rapid involvement of

drones in the medical field, from surveying areas of biological hazards to delivering medical equipment to remote or severely damaged areas.

Drones are used for surveillance of disaster sites and areas contaminated with biological hazards, minimizing the human interaction with the disaster or the hazard, thus protecting the human workforce. It also has a beneficial role

in detecting, preventing, and studying disease outbreaks, like one of their recent uses in mosquito control and the prevention of the Zika Virus outbreak in twenty seventeen.

Where drones were used to spray the areas where the mosquitos breed and hatch their larvae with chemicals

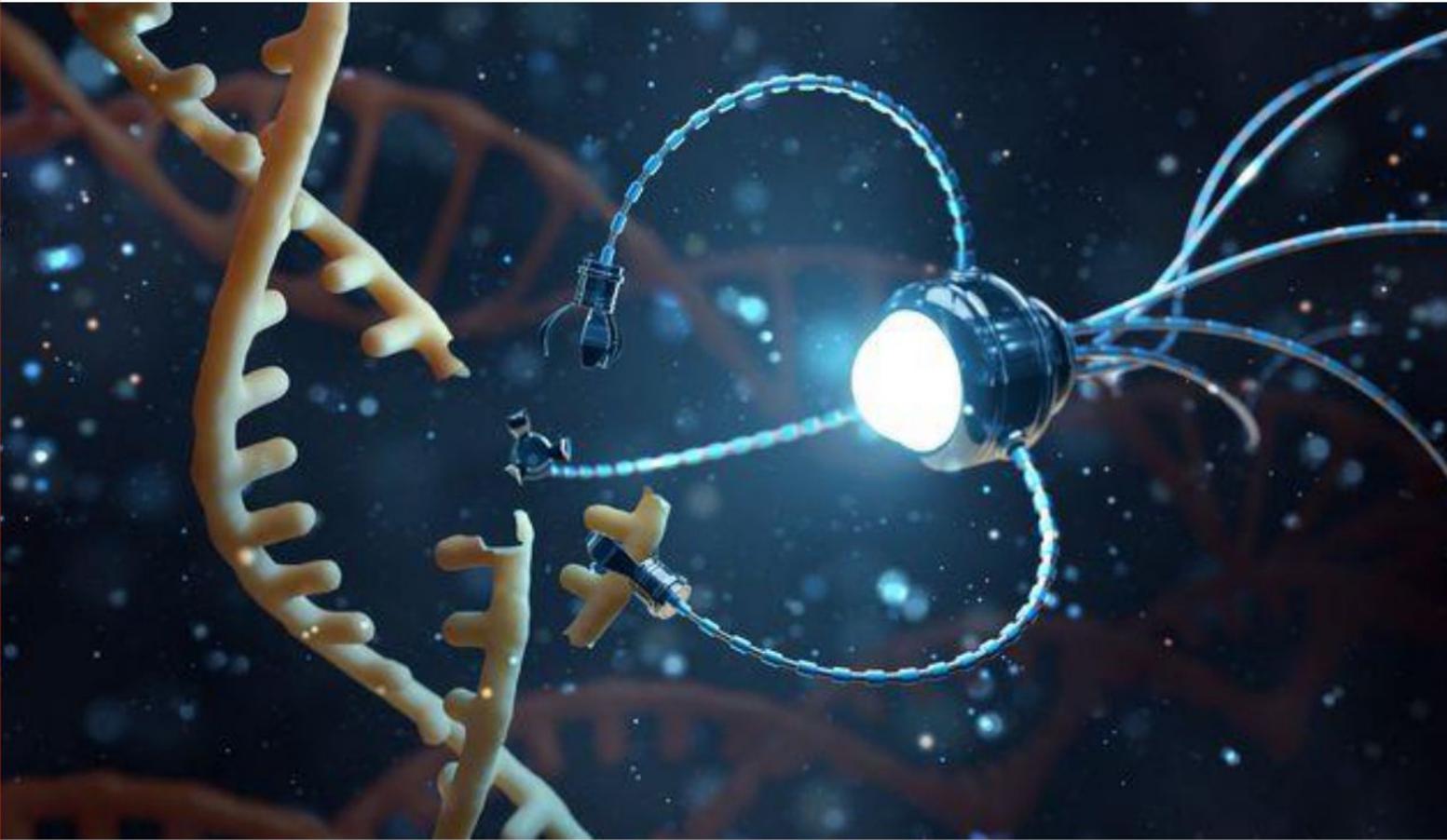
with great precision and accuracy, thus minimizing the severity of the outbreak.

Drones have also found their way into medical delivery systems, delivering medical supplies from one place to another with ease and efficiency within minutes. It is not a necessity to have drones our everyday healthcare system, but it is being increasingly put to good use in places where it's harder for the medical staff to deliver medical aid, from blood bags to drugs and vaccines, especially in the cases of natural disasters or warzones where the delivery is harder on land or much slower.

The Polish Air Force Institute of Technology created a drone called AtraxM, which was designed for rescuing operations and air transport. Where it can precisely identify the

place of an accident, the number of victims, and the severity of the accident. It was equipped with first aid kits containing wound dressing and tools of survival to aid the injured until the arrival of emergency troops to the site, setting a clear example of how drones are being used in surveillance and medical delivery systems, saving both time and effort.

With this rapid involvement of drones in medicine making the idea of drones a much wider one, full of possibilities and hopes. Making an already existing invention, a tool for new chapters, and new beginnings.



## TECHNOLOGY, A NEW ERA OF MEDICINE

**I**n today's world, you see the word technology incorporated in every field and industry, from Art to science. Having a great impact on all of those fields Medicine, including medicine from the smallest inventions like adhesive bandages, CT scans, MRI machines, artificial limbs, and nanoparticles.

Technology is introduced in hospitals and clinics in several shapes and forms. Like for example, the EMR system or the Electronic medical record system is much similar to a computerized version of the medical records you would frequently find in the hospital or a clinic. It includes medical history, diagnosis, lab results, medications, and all the other data collected from the patient from the moment he/she enters the hospital till the last day, and it's updated regularly with every visit.

It is often argued that there is no significant variation between regular EMR and paper records, with some arguing that the latter being harder and much complicated to use, but there are some huge advantages; EMR provides ease of access and is more difficult to manipulate because everything is recorded under unified surveillance, it also effectively incorporates the factors of communication and cooperation between members of the healthcare team.

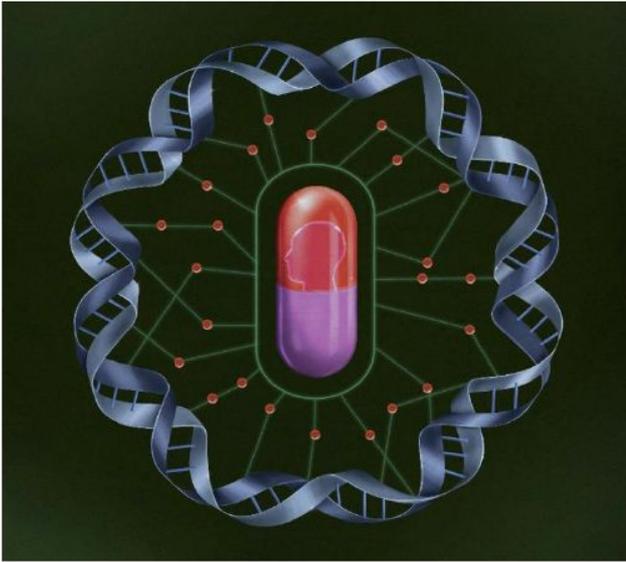
Another great and more advanced example of how technology affected the medical field greatly is Nanoparticles and Nanotechnology, which is becoming a hot topic in today's medical journals and even having its journals like the Journal of nanotechnology and many more. Nanotechnology is the understanding and controlling of matter at dimensions of roughly 1 to 100 nanometres, where unique phenomena enable novel application, or it is simply the engineering of tiny machines on the nanoscale. Nanotechnology has been incorporated into many fields like, environmental, food, and agricultural industries. Paving its way into the medical field, Nanotechnology is helping to improve targeted drug

delivery systems through Nano drugs, where nanoparticles are designed as carriers of the poor targeting drug improving its bioavailability, absorption, and distribution. This technique has been widely used for some time now using different types of Nanocarriers like liposomes being the basic form and others like Ethosomes, Phytosomes, Polymeric nanoparticles, and Nanosuspensions.

The idea of carrying the drug to its targeted tissue or organ is now being integrated. Chemotherapy is administered to the bloodstream which means that it can have a high distribution and also toxicity to the patient's body, so the idea of targeted chemotherapy ensures a reduction in side effects and better results. The chemotherapeutic drug is either encapsulated or conjugated to the surface of the nanoparticle before introducing the drug to the body, where they move directly to the tumor cell, increasing the overall therapeutic index of the drug.

And like that Nanoparticles, computerized medical recording system, and many more technological advances have made their way into the medical field helping to improve and sustain human life, raising our chances of a better life with fewer risks and worries





## HYPER-PERSONALIZED MEDICINE

**F**or the longest time, diagnosis and treatment have solely relied on the bases of weight, Age, height, and later on, organ functions and family history. Relying on the ONE SIZE FITS ALL approach of medicine that is based on the broad population average, and not giving enough consideration to how the treatment is much like tailoring clothes is a big problem, because not everyone has the same parameters, with every person responding to any treatment differently, depending on different factors including the genetic makeup which varies from one person to the other.

The term genomics is the study of genes and their contribution to protein production and influence on metabolic pathways of human physiology, which may in turn lead to variation in their disease susceptibility. Whereas,

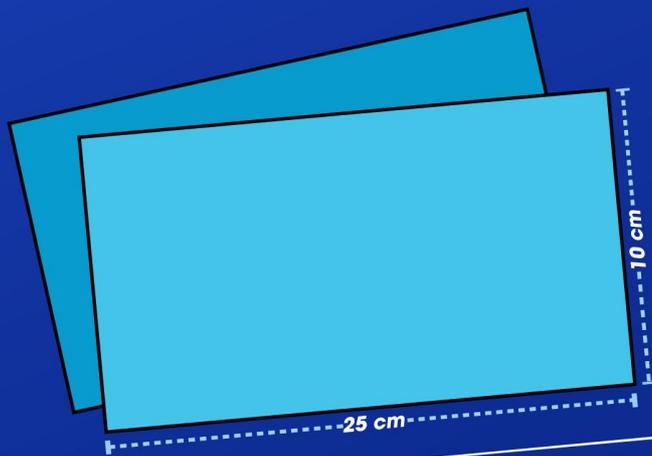
Pharmacogenomics is the field of study that examines the impact of genetic variations on the response of medication. And Hyper-personalized or Personalized medicine is the idea of harnessing a person's genetic and environmental information to develop a treatment plan for this specific person, nearly maximizing this patient's chances of getting the best outcome, reducing adverse reactions and the side effects of the treatment. The core concept of personalized medicine has been in existence since the 1960s, with it being mentioned first in a monogram title in 1998, and in a subsequent publication in 1999, but its application has increased and widened with the research on how to integrate PM more and more into our current medical approach.

The prospect of Personalized medicine is an integral part of detecting, managing, and preventing diseases depend mainly on the impact it has on current medicine. Where some genomic products are building a foundation towards Personalized medicine like the progress in the molecular diagnosis of breast cancer based on molecules such as hormone receptors and RNA, however, there are still little or no application of these molecular diagnostics tools to help understand why the disease occurred or it's progression.

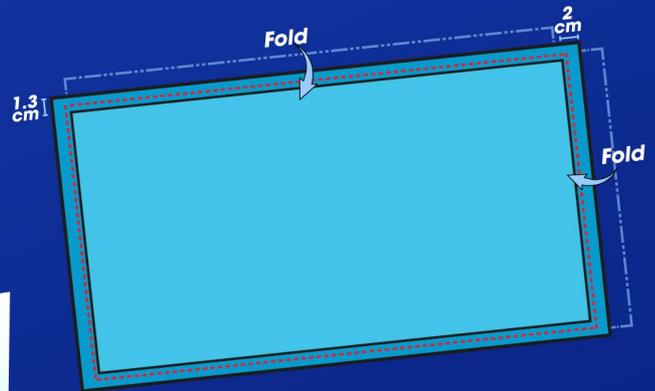
The development of such a technique and approach in medicine is a vision for most of us. It is a dream turning real for those suffering from untreatable diseases or diseases that are just too rare that there are no clinical trials or lab diagnostics done to identify their progression or cure. It is indeed a beginning of an era that we hope would come sooner than later.

# 2 METHODS TO MAKE A MASK

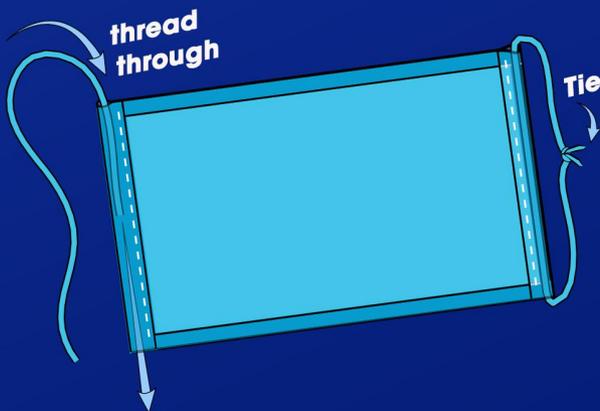
**1.** Cut out two 25 by 10 cm rectangles of cotton fabric and a fabric T-shirt will work too.



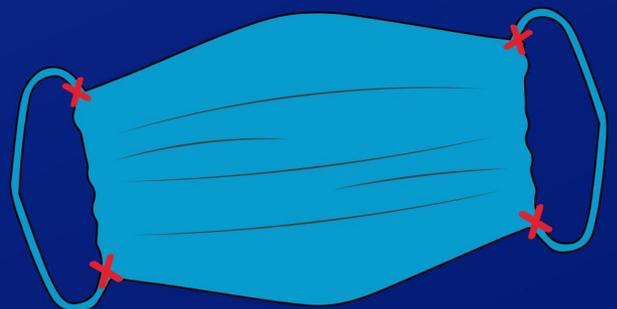
**2.** Fold over all sides then and stitch on these red dashed lines.



**3.** Run the elastic through the hole on each side of the cloth face covering. These will be the ear loops. Tie the ends tight.



**4.** Adjust the mask to fit your face. Then securely stitch the elastic in X places to keep it from slipping.

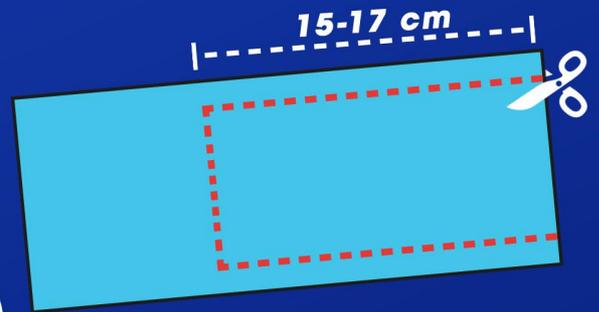


# 2 METHODS TO MAKE A MASK

1. Cut the 17-20 cm from the T-shirt.

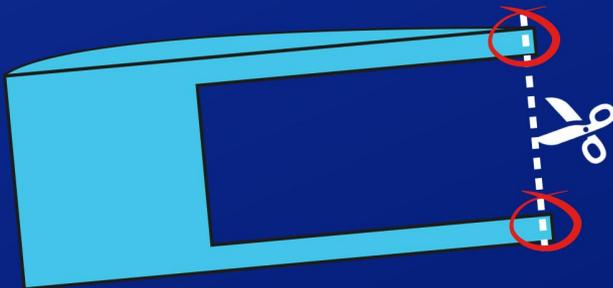


2. Cut as like in the illustration.

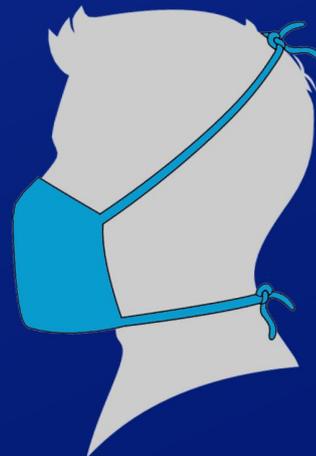


## 2

3. Cut tie strings up and down.



4. Tie strings around neck, then over top of head.



4

# EVERYDAY HUMAN LIVES

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# ONLINE COURSES REVOLUTION

W

ith so much knowledge available

everywhere, self-learning has become easier than ever for many students. Since internet innovation many topics and courses become available to everyone.

Online courses are accessible wherever you are. Many applications and websites are offering courses to students as Coursera and Udemy. Online courses depend mainly on self-study and the ability to understand the given information. Self-study is becoming a widespread technique in both schools and universities to engage students in the learning process. Students have the access to many resources that they can learn not only in the Nowadays the world is fighting a pandemic and there's a global lockdown, and limited social interactions. All schools, universities, and companies have been closed so the only way everyone can work or learn is from home through online courses. It's not a permanent

class, and it's becoming more valuable for learners as it increases their independence and helps them explore more topics and develop new skills

The question remains, will online courses replace the traditional way of delivering information in schools?

I think it can't provide many of the informal social interactions students have at school. As numerous students are doing well in online courses some may struggle to keep up with this learning method. One of the biggest disadvantages is that many students won't have facilities or resources to learn at home if they have no internet access or enough resources.

## CONCLUSION:

way but it's working well so far till the end of the pandemic.

Online courses are generally not as effective as in-person classes, but certainly more beneficial than nothing



# A WALK-THROUGH TIME

**T**echnology has become one of the greatest things we rely on in our day to day life. It's unlocked new capabilities that we never thought were possible. Technology made us capable of learning, working, and communicating more efficiently, improving our productivity and quality of life.

Innovation is derived by the need to find new practical solutions to achieve our aims and

technology is the tool we use to implement our imagination in a practical way.

Amidst the 1950s and today, scientific and technological innovations have revolutionized our lives, from hospitals to outer space or even kitchens.

Thanks to scientists and innovators who were capable of thinking and inventing through all of these

decades. 2020 looks vastly different from the 1950s.

We shall mention some of these amazing inventions that made our daily life much easier.

On a regular day, you might clasp your seatbelt or use an ATM to get some cash or make a call on your cellphone this is called technology.

If you got lost on your way to somewhere and you simply turn on your navigation to guide you. If you were an athlete and you want to run in a comfortable, easy, and fast way you can buy running shoes with lightweight. And if you want to go anywhere you can just use your car, the first steam-powered automobile cars which were capable of human transportation were invented by Nicolas-Joseph cannot in 1769. Since then cars got better and better to transport and save time.

In the kitchen, innovators made use of ice to lower the temperature and thus preserve food that's now called refrigeration. Ovens have been used for many years but the gas ovens were first developed in the early 19s century to cook buns. Nowadays ovens can cook anything with the ability to control and regulate heat. Microwaves heat food by the dielectric heating process in which radiation is used to heat the polarized molecules in food in a few minutes.

In the past if you ever wanted to transfer data you only had to send it by mail and this transfer way consumes time and the message could even be lost. Nowadays has

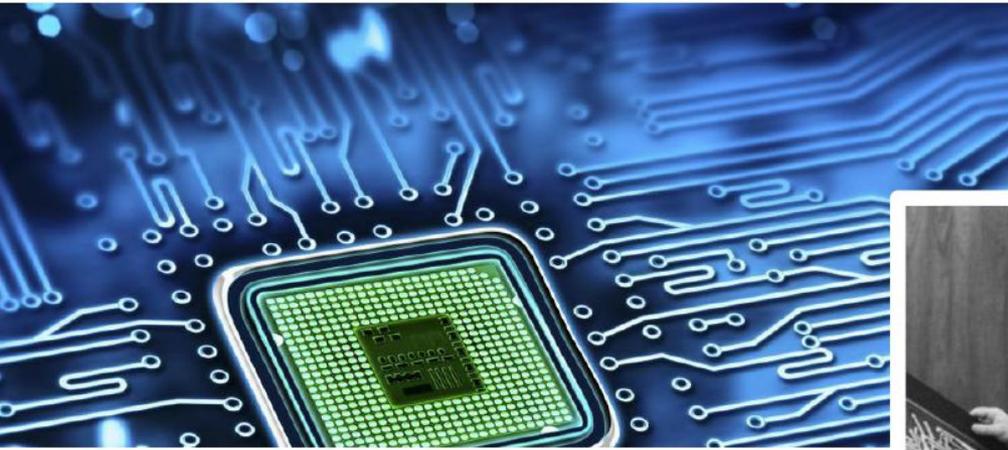
made it so easy that all you have to do is just a click on the message you want to send. The data transfer process has completely changed to an easy, affordable, and reliable way.

Anew phenomenon that influenced us as well is signals technology. Signals consist of many types as audio, speech, video, image, sonar, and radar. Signals are considered a sequence of states in a communication channel that encodes messages. It can deliver sounds to faraway places by using the sound signal used in microphones. Radars provide electromagnetic signals for following aircraft motion.

Technology had an imprint on the medical field as well. Scientists developed a device that generates an intense beam of electromagnetic radiation called laser. Laser medicine is used to diagnose and treat many conditions as photodynamic therapy, laser surgery, microscopy, medical imaging, cancer treatment, prostatectomy, and many other procedures.

The list will continue to get longer and longer and we won't be able to enclose it. To conclude, technology has made our society make it to the point of ignorance to the fact that there might be a day when our technology doesn't work and they can't, at the moment, live without it. We have grown to rely on our technology to make our lives easier that we have become lazy. We have learnt to rely on it that if it goes away we will be lost. We can't deny the grace of technology and we can't deny its impacts.

I'll leave the question to you does it makes us lazy and whether do you think it's good or bad?



# ANCIENT TECH

**F**rom the late 1950s, a shift from Mechanical and analog electronic technology to digital electronics began what is known as 'The Digital revolution'. This revolution depended on the big usage and mass production of digital logics, MOSFETs (MOS transistors), an integrated circuit (IC) chips, their derived technologies, include computers, microprocessors, digital cellular phones, and the Internet which became the main component in our daily lives. The World Wide Web became publicly accessible in 1991, which had been available only to government and universities. In 1993 Marc Andreessen and Eric Bina introduced Mosaic, the first web browser capable of displaying inline images and

the basis for later browsers such as Netscape Navigator and Internet Explorer. After revolutionizing society in the developed world in the 1990s, the digital revolution spread to the masses in the developing world in the 2000s, and by 2010 Cell phone subscribers reached 68% of the world population and the internet users reached 26.6%.

The developments in the mass-production of silicon semiconductor devices paved the way to planar processing by Jean Hoerni, monolithic integrated circuit (IC) chip by Robert Noyce at Fairchild Semiconductor, the metal-oxide-semiconductor field-effect transistor (MOSFET, or MOS transistor) by Mohamed Atalla, and Dawon Kahng at Bell Labs developments.

In 1959, Engineer Mohamed

M. Atalla (Egyptian-American engineer) demonstrated the effectiveness of silicon as a semiconductor material with his process of surface passivation by thermal oxidation. His work in semiconductor technology laid the foundations for modern electronics and laid the milestones for the silicon semiconductor technology. The time from 1989 to 2010 was the turning point in the usage of Technology and the spread of technological awareness, everyone thought that the digital revolution became truly global in this time as well.

In 1989 about 15% of all households in the United States owned a personal computer, by 2000, this was up to 51%; and in 2000 65% owned one, and today there were over 2 billion computers in the world.



# TIME

# MANAGEMENT

# INVENTOR



**H**enry Gantt is an American mechanical

engineer and management consultant who was best known for his work in the development of scientific management. He created the Gantt chart in the 1910s.

Gantt created many different types of charts. He designed his charts so that foremen or other supervisors could quickly know whether production was on schedule, ahead of schedule, or behind schedule. Modern project management software includes this critical function.

Gantt chart provides a graphical illustration of a schedule that helps to plan, coordinate, and track specific tasks in a project.

Gantt (1903) describes two types of balances: The "man's record", which shows what each worker should do and what did he do, and the "daily balance of work", which shows the

amount of work to be done and the amount that is done.

It is constructed with a horizontal axis representing the total time of the project, broken down into increments (for example, days, weeks, or months) and a vertical axis representing the tasks that make up the project.

Gantt gives an example with orders that will require many days to complete. The daily balance has rows for each day and columns for each part or each operation. At the top of each column is the amount needed. The amount entered in the appropriate cell is the number of parts done each day and the cumulative total for that part. Heavy horizontal lines indicate the starting date and the date that the order should be done.

Gantt charts give a clear illustration of project status, but one problem with them is that they don't indicate task dependencies - you cannot tell how one task falling behind schedule affects other tasks



## DR. KAREEM SULIMAN

**B**ack in 2016 one of my students knocked my office door and came in, he asked me one specific question "Would you like to be IEEEPUASB counselor?" I didn't know for sure what to say... Should I accept? Would it be too much responsibility on my shoulders? Many questions popped into my head in the minutes after I heard his request.

A few minutes later... I answered "Yes, it will be honor". One big major problem jumped into my head after I said yes, "What did I do? I never led such team before." And literally I didn't know what to do, only one thing I knew for sure... I must lead this team to more success, popularity, enthusiasm and to brighter future.

After more than six months, I faced with them many problems, we crossed many obstacles, and eventually it turned out to me that I became a student again with them, we learned together how to fix the broken things, how to achieve our goals with the minimum cost, how to understand the people to deliver Science and Engineering to their minds with the simplest way possible.

I became closer to my students, to IEEEPUASB team, understood their needs, I arranged and managed their inside paperwork with the University, I tried so hard to avoid them any unnecessary paperwork load.

In the past two years, IEEEPUASB team become one the most popular, organized, and professional teams in the university, with more than 15 successful events and one big event "Mega Brain to Be" which held in Bibliotheca Alexandria with over 300 attendee, and 10 main speakers.

This team proved me that I was right when I said "Yes" to lead them, I still can remember so many details about the problems we faced, about our successful events that made me so proud of each and every one in IEEEPUASB, starting with each and every volunteer, head of every committee, the board members and finally the Chairman.

I'm keeping my IEEE t-shirt proudly with me, to be a great memory of some extraordinary students who believe in their minds and their potentials, and if the time goes backward again I would like to be their counselor again, and I will join you again in your journey one day in the future.



# I ADVISE

# NEVER LOSE ANYONE

**Q: IS THERE AN INTENTION ON THE PART OF SUPERVISORS IN THE SECTION TO DO A KIND OF ASSOCIATION OR CLUB FOR PEOPLE INTERESTED IN ENGINEERING AND TECHNOLOGY IN GENERAL, WHATEVER ITS AGE, FIELD, PLACE OF WORK OR STUDY?**

Dr. Ahmed: The last period this option was not available, but now we are trying to restructure IEEE EGYPT so that each part is complementary to the other and this part was present but in an indirect way as is the case in IEEE branches that have students from different fields of study are united by their passion for technology. They were involved in events and activities through them, but your suggestion is very good and we are ready to work on the idea and are welcome.

**Q: THIS YEAR WAS SOMEWHAT DISAPPOINTING WITH THE HOPES AND PLANS THAT WE BUILT, INCLUDING CELEBRATING THE EGYPTIAN ENGINEERING DAY AND OUR MEGA EVENT, AND WE WERE TOTALLY READY FOR IMPLEMENTATION, BUT UNFORTUNATELY IT WAS POSTPONED. IN THE COMING YEARS IF THE SITUATION CONTINUES IN THIS WAY WITH A FACE OR HOW WILL THAT BE DEALT WITH?**

Dr. Ahmed: I understood you. We have started with the current conditions, some experiences, but in the early stages of what we see any result or definition sufficiently clear, but the last period we requested support and we have already found several alternatives to support projects such as interviews, workshops and activities and this strategy was applied in several conferences, like the Military Academy conference, were successfully implemented and the atmosphere was great and the communication was different and distinct ... But if these conditions persist, we will try to intensify efforts on this work with this strategy so that we can do some kind of socialization or the propagation for upcoming activities better than the real picture of it because this facilitates and increases the richness and quality of discussion and communication between the attendees,

But unfortunately, this reduces the opportunities to get to know each other personally and opportunities to exchange ideas, information and opinions, and work is being done on that in order to improve the situation more to when the current situation improves and it is a good idea to apply at the branches, and since universities have moved to e-learning, this serves the process and increases its efficiency more. God willing and we are currently making efforts to provide solutions and alternatives that enable us to do all activities normally.

**Q: COULD YOU TELL US HOW YOU GOT TO THIS STAGE TO BE THE SECRETARY OF IEEE EGYPT ALTHOUGH YOU STARTED AS A VOLUNTEER?**

Dr. Ahmed: I will try to summarize as much as possible. One day I was a student like you, I used to hear about activities and I was participating in them just because I wanted that and I never dreamed of arriving that, but my only advice that I followed is that if you work on something. We participated in conferences, organizing activities like conferences and visiting companies. We participated in a lot of things without pay attention to pay back. But the main point as long as you work, you are gaining experience that help you in your next step as if you doing that for the first time, you are learning, the second time you will be part of the working team and the third time you become an instructor and advisor for the organizing team. So the continuity and working directly in such work will help you a lot and as advice, you have to learn about every topic you see even if it is not useful for you at the moment, it will help you in the future. For me, I learned things that not related to my working or studying field but after a while I found myself need it so I won't waste time learning about it. As I see a lot of the young say I don't need to learn about this, but this is a big problem as may in the future, you don't have time to learn it or it is so hard to get this information. when I was young my vacation and free time was only one week, but the rest time is full of actions and work as making training, organizing a lot of things and I think most of the students work in the same way but it always pays back in the future as (making network of friends, learning me things).

**Q: ANOTHER QUESTION "HOW THE FEEDBACK PROCESS IS STRUCTURED?"**

Dr. Ahmed: There is more than one level in the feedback as "general feedback" as to know the feedback from the audience, but I always prefer to take the feedback through the whole project or an event to see people during work until the end. For example working in a conference as a technical program committee, it never means to leave the conference without paying attention to the work how it goes as I have to check with people how it goes and putting check-in points with people to know that the process works well so the feedback means how to define how the process works. The common feedback for you is to survey to know if there is a problem but this type of feedback isn't always helpful as most of participants not pay attention to fill it or they fill it quickly and this is the common problem we always face So for me I prefer the base feedback as to make feedback for each step to follow up in all the projects.

**Q: WHAT DO YOU DO WHEN THE DEADLINE PASSES?**

Dr. Ahmed: You have to send an email before the deadline to show your case and how much time you need to complete your task and see how much time you need to finish it. This is helpful in most of the work unless in the funding agency as their work deadline is critical.

**Q: IF I PUT MY EXPERIENCE IN EVERY FIELD I WORKED IN CIVIL WORK WHILE APPLYING FOR AN INTERNSHIP OR WORK IN THE CV, WOULD THAT MAKE THAT PLACE REFUSE ME, BECAUSE OF THAT RANDOM EXPERIENCE?**

Dr. Ahmed: You should adapt your CV and that's depending on the place that you're applying to if it's an academic job, you should highlight this experience and the others shouldn't be highlighted.

**Q: IF I APPLIED FOR SOMETHING ONLINE SPECIALIZED IN THE FIELD OF MY STUDY, THAT WILL IMPROVE MY SKILLS, WOULD IT BE BETTER THAN WORKING AS A CALL CENTER?**

Dr. Ahmed: Yes, of course, it would be better than working as a call center, for instance, you worked in a call center, so almost everyone neglect anything else, so that would reduce your chances when you apply for something in your field, so you should have something sorted thing to do in that field while working in a call center and that would give you the priority.

**Q: I HAVE A QUESTION FROM 3 PARTS, IS THERE SOMETHING LIKE BEST VOLUNTEER PER MONTH FOR THE BRANCHES IN ALL SECTIONS, 2ND PART, IS THERE SOMETHING WE SHOULD DO AS A BRANCH TO BE BETTER AS WE AREN'T THE FIRST BRANCH EVER IN THE SECTION, 3RD PART, IS THERE SOMETHING I CAN DO AS A VOLUNTEER TO MAKE THE WHOLE BRANCH AND THE SECTION BE BETTER?**

Dr. Ahmed: There are a lot of competitions for branches to win the the best award in a region, all branches should send a report over the year, then we choose the best branch.

The answer to the 2nd part, there's only one secret which is the activities that the branch do, like organizing a competition between students in some track, make some international conferences host in that track, if you are in a new branch that doesn't have many activities, that branch should help other branches then these branches will help them in return and that will make the branch better.

There are a lot of tracks as training some branches as IEEE makes activities to give the university students a lot of experience and to learn them more Volunteering work you will do it and can't wait for any feedback. If you work a lot of operations, local operations, or conferences. You will learn and take a lot of experience in the future.

**Q: WHAT IS THE POSSIBILITY OF COOPERATION BETWEEN STUDENTBRANCHES IN EGYPT AND THE OTHER REGIONS?**

Dr. Ahmed: We try to link with them and learn from them as Lebanon and Tunisia the students' branches do a lot of activities. We are trying to make networks to connect with them online.

**Q: LAST QUESTION, WHEN WE HAVE A PROBLEM WITH OUR WORK WHAT SHALL WE DO?**

Dr. Ahmed: It depends on the problem; Most of the time the the problem appears in the result so the best thing that someone have more experience to give analysis and advice you to solve the problem. And we should take care of the first steps to get the solution to the problem.

# SPECIAL THANKS

TO ALL WHO  
WORKED HARD ON THE  
MAGAZINE AND DID THEIR BEST  
TO MAKE IT WONDERFUL, THANKS  
FOR YOUR EFFORT, YOU  
ARE THE BEST.

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