



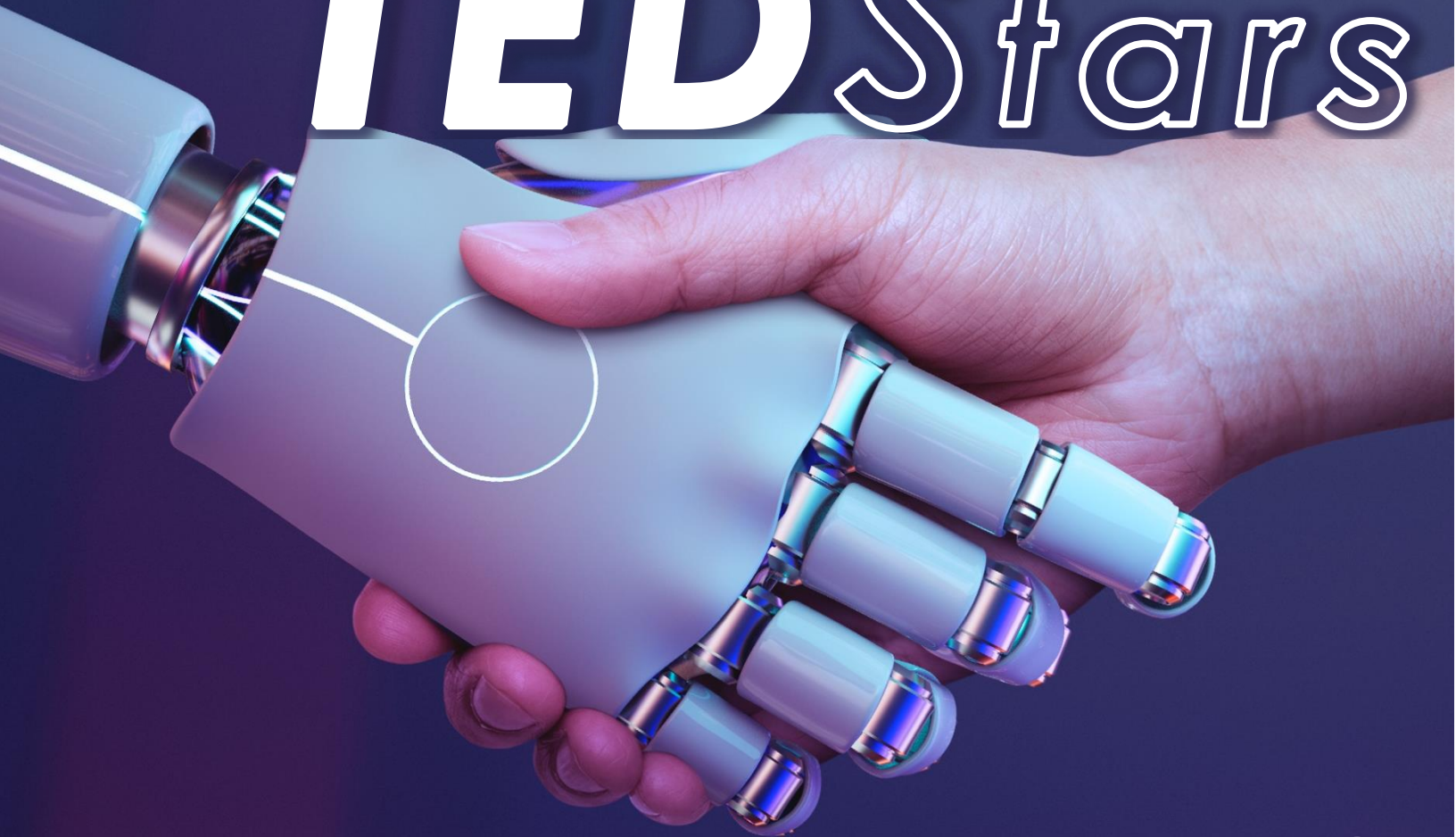
ENGINEERING AND  
TECHNOLOGY CLUB

University of Science and Technology of Fujairah



جامعة العلوم والتقنية في الفجيرة  
UNIVERSITY OF SCIENCE & TECHNOLOGY OF FUJAIRAH

# USTF TED Stars



*Can Machines Have* **Consciousness?**

The boundaries between reality & Science fiction.

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USTF **T**echnology, **E**ngineering & **D**esign STARS – Volume 1 – 2021-2022



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## Team



*Director: Eng. Momen Odeh*



*Editor: Malake Halabi*



*Editor: Asseel El Habach*



*Editor: Israa Alasmawy*





## Message From the Dean

It is our pleasure at the college of engineering and technology to launch the first edition of the college of engineering and technology students' news TED. The passion of the students to actively participate in the magazine was remarkable. This passion ensures the achievement of the goal of the news to have open minded and creative students who are able to report, present, and discuss any important issues in a logic and constructive way and provide conclusions and solution whenever needed. Giving the students the freedom to select the issues they want to discuss, in alignment with the ethical norms and guidelines in UAE, represents an important added value to the magazine as the selected topics are expected to be in the current and future focal of interest of students and their communities. That student-community interaction helps to achieve USTF mission of developing graduates with creative minds, high level of professional skills and social responsibility to contribute to the sustainable development of the UAE, the region and the world.

**Prof. Ali Ahmed Abouelnour**

Dean, college of Engineering & Technology

# The Wanderer

By: Zain Abdullah Melli

## Advice FOR FIRST-GENERATION STUDENTS:

Becoming the firsts in your family to go to college is nerve-wracking. Having to work everything out on your own and learning about all the campus resources can be a stressing endeavor pressuring, but you're not alone. Here is a bit of advice that I will provide you with as a fellow first-generation student.



### Plan, plan, plan.

As a first-generation university student, most probably you do not have much background in college preparation. A nice antidote to inexperience is advance planning. Script every little aspect of the transition to the college life, from the moment you submit your college applications to where you'll live when you start at the semester and when it'll end.

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### Attend orientation Sessions.

If you enroll in a wide campus-based program, attend student orientation sessions. One reason many students leave school is that they never feel comfortable there. Orientation sessions can help ease the discomfort you may have. You'll learn where things are, meet new people and acquire a jump start on making campus feel like your home.



### Get Involved.

Whether live at home with your family (as many first-generation students do) or on campus, you have a good opportunity to join student clubs, sports leagues or any other extracurricular activities. These clubs and groups are a great chance to immerse yourself in student culture and make you feel like you belong on campus. Don't be shy - get active.

## Find mentors who understand.

First-generation students often say that relatives and family members don't understand why getting a degree is very important. Some families may even openly oppose attending college. Find people - maybe family friends or professors - who appreciate the pros of attending college and getting your degree, so that they can be a rock of support that you need to get the most of your experience.



## Find first-generation peers.

You might feel pretty lonely being a first-generation student. Old friends could also be taking a different path from your own. Finding new friends on campus who are pretty much in a similar position that you're in can make you feel less isolated.

## CALL FOR ACTION [By Momen Odeh]

Dear Student,

At first, The Engineering & Technology Club would like to thank all students who participated in the production of our first issue of this magazine.

We would like to encourage all students to participate in the next issue of this magazine by the new Academic year 2022-2023.

Anything is welcomed, articles, poems, graphic design, photography...etc., you're only limited by your imagination.

# Parents Intervention

By: Anonymous

Parents' interference in any matter related to their children is a very natural thing, and the word "we know the best for you" means we know and understand more than you, we have gone through experiences that you have not, lived in different times, and we know the right choice for you.

Most of the time, parents' choices are correct, and your choice is the wrong one, if you decide to go with your choice, you might end up saying "I wish that what happened did not happen and I wish I had heard from my parents". But in some cases, the parent's choice and their intervention is not correct, especially at this time and with our generation, especially with long-life effects and somewhat permanent outcomes on your future, such as studying and marriage.



In my opinion (and in most cases this will apply in a fictional candy land), the correct methodology should be that the parents can give their opinion and the advice to their children, and the choice remains for you. So, if your choice is right, you will feel satisfied and proud. However, if your choices are wrong, you must learn the responsibility to face and live with the consequences.

However, as we live in a very conservative culture, most of the times the children (despite their age) might get forced by the parents to a certain decision; if the future shows that the decision was the correct one, you might have escaped any bad outcomes, but you will be executing someone else's decision in matters related to your life. You will still feel that you are not the decision-maker, and you are not in the driver's seat of your life.

On the other hand, if the parent's forced decision fails, no matter how many days and years pass, you are the only one affected by any negative outcome of that decision. You will feel angry with yourself that you didn't go with your choice, and the worst thing that can happen is that you might (even unintentionally) develop feelings of blame towards your parents.

In the end, who should stand the blame, you who weren't able to take control of your life? Or is it the parents, who did not listen to you? What if you blame your family for a lifetime? Or what if your family blames you for a lifetime?



# OUR CHAMPIONS

By: Editor Team  
& Prosperous Team Members

## Prosperous Team

### *Sand Storage Technology (SST)*

Our college and the entire university congratulates our champions, Sohair Mahmoud Idrees, Salsabeel Mohamed Gamry, Raghad Ibrahim Melhem, Mohamed Ayman Nassif, Maram Hussam Himmoud, Eman Ahmed Mustafa, Shahad Ayman Nassif, Maha Khameis Abdulla, for their amazing achievement in winning the first place in Injaz UAE 2022 competition held in the premise of Expo 2020.

### Challenge and Context.

A paradigm shift is taking place on a global scale. We are witnessing a historic conversion of energy systems that are based on fossil fuels to ones powered by green, clean, and renewable energy,

all those terms fall under the same meaning which is “energy coming from natural resources”. One of the most important challenges of using green energy is the consistent availability of power. For instance, solar powered electricity is generated only when sunshine is available and turns off at night.

The team aimed to achieve a pioneering step towards promoting energy sustainability by utilizing a new method to store the power in a sustainable and eco-friendly fashion, rather than storing energy in traditional batteries in which famous the power is converted as chemical energy by using batteries. Yet there are a lot of disadvantages associated with the use of batteries such as: batteries cannot be stored in a discharged condition, low energy density, allows only a limited number of full discharge cycles, environmentally unfriendly, and thermal runaway can occur with improper charging. Needless to mention that disposing batteries can cause a variety of environmental impacts.

The team developed a system that capitalizes on the storage of energy produced by the sun into a sand medium. The logic of choosing the sun as a source of energy is that it is abundant, and the solar cells are advanced enough to capture quite a lot of the energy produced by the sun. As for storing the energy, the team chose **SAND!** Yes, you heard it, normal plain sand.

The reason behind choosing the sand as a storage medium is its specific heat absorption capacity. Results have shown its capability of storing thermal energy can reach up to 800-1000 °C. Unlike traditional storage media used in thermal energy storage systems, such as synthetic oils and molten salts, sand is also abundant in many regions and specifically in the UAE.



So, the main objective of the project is to save the excess energy from the solar panels by converting it to thermal, through three main steps: firstly, collect light from the sun through solar panels. Second convert the current from Direct Current to Alternating Current, and finally, store the excess amount of energy in an area of the sand underground to be maintained by specific thermal coils.

The Coils are connected to a water tank which is responsible of generating a steam which in it turn allows the turbines to turn and generate electrical power, which can be utilized for general purposes.

The team focused on applying this idea in houses and living areas, but the idea is broad, and it can be applied to other industries or applications. The concept of storing excess energy can allow making use of the excess power later on at night, which can help to reduce the electric grid load and feed the high demand loads through efficient, ecofriendly, inexpensive and sustainable way.

By connecting multiple homes to the same centralized storage device, the stored power can be used by neighboring homes which are connected to the same storage device, so the benefits multiply and the costs reduce exponentially.





## *Can Machines Have Consciousness?* *By: Momen Odeh*

Which one of you, after watching the first Iron Man movie in 2008, thought “I want my own Jarvis” ? The thought of having an AI machine at my house that I can talk to, understand me, and even tell jokes and understand sarcasm. I still remember when Tony was deciding on the color of the suit to add some red color in it, and Jarvis joked in sarcasm “that should keep a low profile”.

The eternal question of whether machines can or cannot have human-like consciousness is not new, with advocates of strong artificial intelligence (strong AI) and weak artificial intelligence (weak AI), AI have exchanged philosophical debates for a very long time. John R. Searle, characterized as a strong AI assuming that “...the appropriately programmed computer really is a mind, in the sense that computers given the right programs can be literally said to understand and have cognitive states” (Searle, 1980, p. 417). In contrast, weak AI assumes that machines do not have human-like consciousness, thoughts and sentience but at best simulate the concept of thoughts and understanding.

When we think about the definition of artificial consciousness the difficult question is how do we define consciousness? Our understanding of human consciousness is modeled by our phenomenal experience. Related to this, the question of how to know whether a machine has consciousness or not is a very relative topic.

To answer this topic, it's useful to consider the philosophical aspect of consciousness which focuses on human perception (or animal). There are many concepts of consciousness and normally, we distinguish between two type: phenomenal and access.

As suggested by Ned Block in his seminal 1995 article: 'Phenomenal consciousness is experience; the phenomenally conscious aspect of a state is what it is like to be in that state. The mark of access-consciousness, by contrast, is availability for use in reasoning and rationally guiding speech and action.

One example of phenomenal consciousness discussed by Block is a loud noise that you do not consciously notice because you are paying attention to something else. Block is sure that you were aware of the noise (phenomenal consciousness) but just not "consciously aware" (access consciousness).

Overall, researchers mainly agree that current AI machines are not conscious—despite of all science fiction that seem to suggest otherwise.

But let's stop talking about philosophical issues and get to the real science.

Artificial Intelligence is probably the most complex and astonishing creations of mankind to date, even that if we disregard the fact that the field remains mostly unexplored, which means that all breathtaking AI applications that we see, read about, or interact with in our present days represent merely the tip of the AI iceberg.

AI's powerful capabilities and rapid growth have made some people paranoid about the imminent of an AI takeover. Furthermore, the transformation that AI brought in different industries and fields has made both business leaders and the general public think that we are close to accomplishing the peak of AI research and reaching the maximum of AI's potential. But, understanding the different types of AI that can be hypothetically achieved and the types that exist now will paint the bigger picture on AI's so much unexplored and hopefully future potential.

Depending on how an AI compares to humans in terms of their ability to “think” and maybe even “feel” like humans. According to this system of classification, there are four main types of AI/AI-based systems: reactive AI, limited memory AI, theory of mind, and self-aware AI.

- **Reactive Machines**

These are the oldest forms of AI and they have very limited capability. These AIs do not have memory-based functionality. This means that they can not use previously gained experiences to enhance their present actions, i.e., these machines do not have the ability to “learn.” They could only be used to respond to a limited set of inputs. They cannot be used to rely on memory to improve their performance. A popular example is IBM's Deep Blue, an AI that beat chess Grandmaster Garry Kasparov in 1997.

- **Limited Memory**

Limited memory machines, in addition to having the capabilities of reactive machines, also have the capability of learning from historical data to make decisions. Nearly all existing applications that we know of come under this category of AI, such as those using deep learning are trained by large volumes of training data that they use to adjust themselves to enhance future performance. For instance, an image recognition AI is trained using hundred of thousands of labeled images to teach it to classify objects. When an image is input to such an AI, it uses its learning experience that it got from the training images dataset as references to understand the contents of the image presented to it, and based on its “learning experience” it labels the new image with some relatively high accuracy.

### TYPES OF AI

#### REACTIVE

Has no memory,  
only responds to  
different stimuli

#### LIMITED MEMORY

Uses memory to  
learn and improve  
its responses

#### THEORY OF MIND

Understands the  
needs of other  
intelligent entities

#### SELF-AWARE

Has human-like  
intelligence and  
self-awareness

While the previous two types of AI are found in abundance, the next two types that I'm going to present, for now, they either exist as a theoretical concept or a work in progress.

- Theory of Mind

Theory of mind is the next level of Artificial Intelligence that researchers are currently working on making it a reality. A theory of mind AI will be able to better understand the entities it will interact with by understanding their processes, emotions, needs, thoughts and even beliefs. Achieving Theory of mind will require the development not only in the field of artificial emotional intelligence, but all AI branches. Because to truly understand human needs, AIs will have to recognize humans as individuals whose minds can be defined and shaped by multiple factors, essentially, AIs need the ability to "understand" humans.

- Self-aware

This is the final stage of AI development which currently exists only in theory and science fiction. Basically, this type is Jarvis (from Iron Man); the AI I mentioned in the beginning of this piece.

Self-aware AI is an AI that has evolved to be so similar to the human brain that it has developed self-awareness. Creating this type of AI, which is decades, if not centuries away from happening, is and will always be the ultimate goal of all AI research. This type of AI will not only be able to understand and induce emotions in those it interacts with, but also have emotions, needs, beliefs, and potentially desires of its own.

This is the type of AI that doomsday preachers of the technology are wary of. Although the achievement of self-aware AI can potentially fast track our technology and progress our human civilization by leaps and bounds.

It can also potentially lead to catastrophe. Since, once self-aware, the AI would be capable of having ideas like self-preservation which may directly or indirectly mean the end for humanity, since such AI could easily bypass the intellect of any human and plot intricate schemes to take over the planet.

At this point, it is hard to imagine our world where more advanced types of AI exist. However, it is clear that there is a very long roadmap to get there as the current state of AI development, especially compared to where we want it to get to, the current AI is still in its rudimentary stages.

For those holding a negative perspective for the future of AI, this can let you relax and take a breath, it is a little too soon to fear the singularity. And for those like me who are optimistic about the future of AI, the fact that we barely scratched the surface of AI development makes me think that the future will be even more thrilling.



# The Heart Of Fujairah

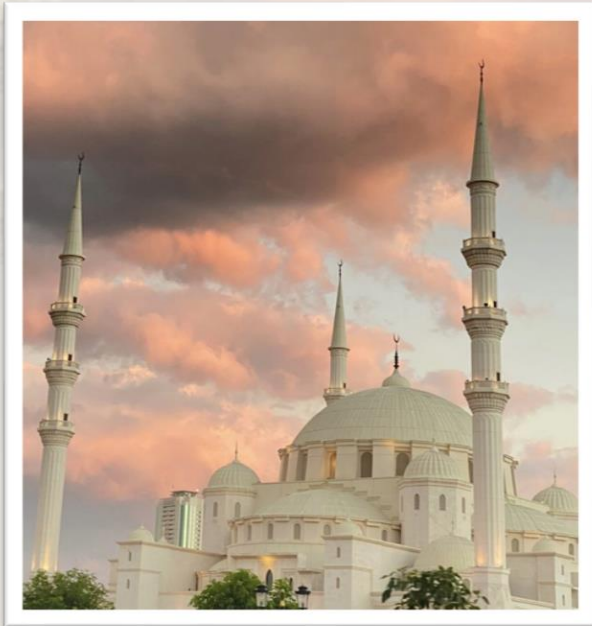
# Art

*Shots By: Fatmah Saeed Alkaabi*

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The city of Fujairah truly embodies the words tranquility and serene. Starting from the beach to the beautiful mountains surrounding the emirate, you can feel the calmness in the air immediately. I believe the heart of Fujairah lies in its exquisite natural elements and its representation of the Emirati Heritage.



# *ARTISTIC YOUTH* By: Israa Alasmawy

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*"Art is harmony parallel  
with nature."*

*Still Life Composition*

*Drawn By: Israa Alasmawy  
Interior Design Department  
Instructor: Dr.Ola Sherif*







*"There is no must in art  
because art is free."*

*Mixed Media Watercolor*

*Drawn By: Israa Alasmawy  
Interior Design Department  
Instructor: Dr.Ola Sherif*