

# The Prelusion



**One Team Many Dreams**

# History of ACES

AIUB Community of Engineering Students (ACES) got approval from Office of Student Affairs (OSA), AIUB at December 4, 2013. Right after 3 months started it's success journey at April 4, 2014. The design of the ACES constitution started around 6 months before its approval date from AIUB. ACES constitution was designed with the suggestions and guidance of the Dean (Faculty of Engineering), Director (Faculty of Engineering), Director (Office of Student Affairs) and Special Assistants (Office of Student Affairs). Also while designing the constitution opinions and feedbacks were taken from the current students and alumni of Faculty of Engineering to establish ACES as an effective engineering community. The vision of ACES is to become a professional student organization in providing excellent welfare and services as well as creating transformative experiences and responsible members. ACES is the core departmental club under Faculty of Engineering which was formed based on the necessity and with an eye to bring further welfare to the students of Faculty of Engineering. ACES placed a competition to fix the tagline and logo. The logo and tagline ACES is currently using is the outcome of that contest. The activities of ACES are divided into parts i) Regular Activities ii) Alumna Group Activities iii) Research Group Activities. Regular activities include organizing seminars, workshops, project competitions, industrial tours etc. ACES is committed to organize seminars and workshops mainly by Alumni of Faculty of Engineering and Key Persons from industries/companies. ACES also ensures that the members should get at least one industrial tour per year. Alumna Group has the aim to bring the alumni back to AIUB where through ACES; they will get the platform to present their academic and professional experience also which will create a bridge to make a connection between alumni and current students. Research Group provides a platform to the current students as well as alumni to form research group according to their interest and take participate in different competitions. At first recruitment of ACES 86 students from Faculty of Engineering joined ACES. The first Industrial took place at Energypac at April 4th, 2014. 46 members participated in that tour. Right after this tour the temporary ACES committee was formed with the senior members. The temporary working committee worked for 2 months, and then the first official executive body was declared. In the year 2014, ACES organized 3 industrial tours, 6 seminars and 4 workshops. Right after 2 years, at present ACES has 620 members. Till now ACES has completed 10 industrial tours. Also students of different semesters are engaging themselves in different research activities. Alumni are taking seminars and workshops regularly. Advisors, Mentor, Motivators and ACES Student Committee are working hard to make ACES more effective. Today whatever ACES is achieved the most credit goes to the members, well-wishers and the alumni who are always active and continuously providing their feedback as well as support for the betterment of ACES so that it can serve its member and as well as engineering community in a grander way.

# **ACES MAGAZINE**

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# The Life of Nikola Tesla

Nikola Tesla is often called one of history's most important inventors, one whose discoveries in the field of electricity were way ahead of his time and continue to influence technology today. Despite his accomplishments, however, Tesla died penniless and without the accolades that would have ultimately earned over a century later. Nikola Tesla had a vision of what it is to come into the future. Tesla had enormous dreams and he had the genius to carry them out. Tesla was a dreamer. He could envision a technology in his mind. The "genius who lit the world" is now commemorated with an electrical unit called the Tesla, has a place in the inventor's hall of fame, streets, statues, and a prestigious engineer's award in his name, but in life he wasn't always so successful.

## Brilliant scientist, terrible businessman

Nikola Tesla was born in 1856 in a town called Smiljan, today part of Croatia but then located within the borders of the Austro-Hungarian Empire. His father was a priest and his mother, despite not having any formal education, tinkered in machinery and was known for having a spectacular memory. Tesla's career as an inventor began early; while working at the Central Telegraph Office in Budapest, at the age of just 26, he is reported to have first sketched out the principles for a rotating magnetic field — an important idea still used in many electromechanical devices. This major achievement laid the groundwork for many of his future inventions, including the alternating current motor and ultimately led him to New York City in 1884, lured by Thomas Edison and his groundbreaking engineering factory, Edison Machine Works.

It is often said that as brilliant a scientist as Tesla was, he was an equally terrible businessman, unable (or possibly unwilling) to see the commercial value behind his ideas. Thomas Edison was both an inventor and a business mogul focused on the bottom line, and he often clashed with Tesla over methods and ideology. It was also unlikely, perhaps, that two minds so brilliant could coexist in peace for very long and, indeed, Tesla quit Edison Machine Works only a year later. Tesla's creativity was given free rein at the new laboratory



he established, Tesla Electric Light and Manufacturing, where he experimented with early X-ray technology, electrical resonance, arc lamps and other ideas. Moves to Colorado and then back to New York coincided with other great scientific feats, including advances in turbine science, the installation of the first hydroelectric power station at Niagara Falls and, most importantly, the perfection of his alternating current system.

## Edison vs Tesla

Tesla's most famous and important idea, alternating current (AC), was an answer to his old boss Edison's inefficient use of direct current (DC) in the new electric age. While DC power stations sent electricity flowing in one direction in a straight line, alternating currents change direction quickly, and could do so at a much higher voltage. Indeed, Edison's power lines that crisscrossed the Atlantic seaboard were short and weak due to DC, while AC was able to send electricity much farther. Though Thomas Edison had more resources and an established reputation, Tesla's AC power grids eventually became the norm. Several dozen of Tesla's patents were related to alternating current science. People don't realize but, Tesla suffered from mental illness. Today we call it OCD (Obsessive Compulsive Disorder). But back then, we were clueless about this and so because of this obsessiveness that he had, it impaired his work later in life. When he should be enjoying the fruits of his endeavors, other peoples are raiding on his patents, other peoples are capitalizing on his work without giving him proper credits. And he was suffering from mental illness. Tesla would live out his last years in a New York hotel. In 1943, he dies penniless and alone. His rival Thomas Edison would be awarded 1000 patents in his career, more than any other inventor. But losing the current wars to Nikola Tesla would mark the better defeats of his career. The battle between Edison in DC and Tesla in AC was ultimately won by Tesla. Today, more than 99% of all the electricity is generated and distributed using alternating current and that comes down to the ideas and visions that Tesla had in the late 1880s.

Source:

<http://www.biography.com/people/nikola-tesla-9504443>

<http://home.earthlink.net/~drestinblack/didyouknow.htm>

WRITTEN BY:

MOHAMMAD IRFAN YOUSUF

MEMBER OF ACES

# Message From

Dr. Carmen Z. Lamagna

Vice Chancellor  
American International University-Bangladesh (AIUB)



Creativity knows no bounds, and it takes courage to embrace the old with the new. ACES reminds me every time that art itself is not a forgotten form, but one that has grown to intriguing horizons. Great vision without great people is irrelevant. No organization can hope to achieve its true potential for greatness without having the minds and hearts to support it in that pursuit. Enclosed within the four walls of a classroom, our students are undoubtedly equipped with the theoretical know-how of surviving and succeeding in their respective fields, but our various co-curricular activities ranging from insightful seminars to constructive workshops, aim to provide them with a much-needed perspective on its practical applications in the real world. And ACES has carried forward this very notion for two consecutive years, and still holds great promise for the years to come. I wish them all the best with their endeavors and look forward to witnessing them realize their aspirations even further.

**Nadia Anwar**

**Founder & Vice President  
Student Affairs, AIUB**



They say, life is about finding yourself, about creating an identity. But with the status quo constantly changing, it's an uphill struggle for even the best of us. It's no wonder most institutions are obsessively working their way to try and keep up with tomorrow. It's been a long standing practice here at AIUB to do just the same. Today's youth will be the leaders of tomorrow, and this is a test of great leadership and perseverance. ACES has proved to be one of the most proactive groups in AIUB, rigorously engaging students in developing themselves. I say this with extreme pride that these young actors will undoubtedly shine in the future, wherever they go.



## Prof. Dr. A.B.M Siddique Hossain

### Dean, Faculty of Engineering, AIUB Advisor, ACES

"Optimism is essential to achievement  
and it is also the foundation of courage and true progress"

- Nicholas Murray Butler

Greetings!

The advancement of technology has remarkably augmented the quality of life to a new level. In contemporary history, every appearance of a new technology has made vast contribution to the social advancement, enhancing the quality of life. To keep pace and to get acquainted with this advancement, it is imperative to explore the WHAT, WHY and HOW behind these technologies. And to accomplish these, I believe, the book-learned knowledge must need to be accompanied by some didactic activities. I'm profoundly privileged to be a part of AIUB which firmly promotes this perception. Through different didactic seminars, workshops and tours AIUB Community of Engineering Students (ACES) not only promote informative knowledge, it also helps to learn to conquer the advanced world. As far as my knowledge is concerned, from the very beginning ACES has maintained a concrete position focusing on their goal and over time they managed to achieve their goal through their hard work, dedication and perseverance.

On this very occasion, I would like to take the opportunity to congratulate the entire ACES team for all their achievements and also like to express my gratitude for the inevitable efforts, hard works and dedications which have made enormous contribution in the betterment of the students in EEE department.

I strongly believe that, all our dreams can come true if we have the courage to pursue them. I wish, luck and success be always with you. No matter how large the obstacles are, don't let the hurdles get a hold of you, stand strong and united with focus and calmness, you are certain to conquer all the success you ever desired for.



# Dr. Md. Abdur Rahman

Director, Faculty of Engineering, AIUB  
Advisor, ACES

"You never change things by fighting the existing reality  
To change something,  
Build a new model that makes the existing obsolete"

- Buckminster Fuller

Greetings!

The elevation in technology and innovation have spread rapidly in much of the world and to keep pace with this progression it is essential to explore the intrinsic definition of technology. I firmly believe that, it is the engineers who made it all possible in this enormous advancement. AIUB is one of the most grooming and acknowledged universities in the country which is infinitely contributing in the engineering sector of the country with great dignity. EEE and CoE are the cultivating departments of AIUB where highly qualified faculty members, well equipped laboratory facilities and abreast curriculum are adequate to assemble the students for the future cognitive challenges. Undeniably, behind this development of EEE/CoE departments, an appreciative amount of contribution is found from the clubs that are running under the respective departments – AIUB Community of Engineering Students (ACES) is one of them.

Being one of the advisors of this well-known club, I feel immensely proud to express my sincere appreciation to the ACES team. From its very beginning, ACES team exhibited tremendous interest, zeal and courage to uphold their goals and all their achievements have put enough evidence that they have achieved what they always dreamt and what they are capable of.

Different informative and instructive seminars and workshops are regularly organized by ACES which immensely contributes in the greater interest of the students. Industrial tours are also organized which also play imperative role in learning aspect of the students where they get the opportunity to get themselves involved with the practical scenario. Again one of the distinctive feature of ACES is to maintain a conjunctive connection with the alumni which provides opportunity to get connected with the institution.

Counting all their achievements, hard-working and dedication, it gives me enormous satisfaction and I truly yearn greater success for the ACES team.

# Manzur H. Khan

Director, Office of Student Affairs [OSA]  
American International University-Bangladesh (AIUB)



It's an aggressively competitive market out there today. Everyone's battling their way through, to find a foothold somewhere, in hopes of making their marks and taking a stand, amidst all the chaos. There's no room for error anymore. One must push on relentlessly, improvising on even the minor details, sharpening their knowledge, skills, and most importantly, the adaptability to the dynamic changes of the work environment today. ACES has been an ideal icon for inspiring students from their field in pursuing the continuous empowerment of their core competencies in order to excel in any and all of the ventures they take up in the future. They've proven their talent, passion, and dedication towards extracurricular activities, time and time again. We couldn't be more proud of them. I'm sure they'll climb further up the ladder of success and make their marks.



## Ziarat Hossain Khan

Deputy Director, Office of Student Affairs [OSA]  
American International University-Bangladesh (AIUB)

When we had envisioned this university, we believed in freedom of academics that stimulates the personal and professional growth of students. And all our co-curricular efforts have long been focused on enabling and encouraging just that. ACES is relatively a new addition in our student organizations, but they have already proved their dexterous talent as a force to be reckoned with. I believe their leadership and vision of the future will take them further towards their goal, establishing themselves within the community with their intellect and actions. They have been one of the most proactive groups at AIUB, continuously innovating constructive activities and involving the student body in enhancing and advancing the progress of the Faculty of Engineering.

# **Chowdhury Akram Hossain**

**Special Assistant (OSA),  
Assistant Professor, Faculty of Engineering, AIUB  
Advisor, ACES**



**T**hat very day when AIUB Community of Engineering Students (ACES), commenced its journey, in fact a successful one I would say. Since the 1st day of its saga, I have seen it's back and forth. While designing its constitution, this community took opinions, feedbacks and suggestions from different faculty members as well as alumni members, which according to me is an impressive approach to involve its associate people. It is the core club of American International University-Bangladesh(AIUB). Being a core club and with limited resources at the very beginning, it has grown itself as a professional student organization in providing excellent pragmatic knowledge to its members.

For the welfare and smooth operations of this club I tried to provide support, whether materialistic or intangible, though I think I might not be able to do so cent per cent. Even then I have attempted little efforts of mine to supplement suggestions and advisory tools to enhance its efficiency.

Chronologically, ACES has evolved itself and went through a regular contest of maintaining quality which it had overcome in a handsome way by its activities like hosting seminars, workshops, research activities, industrial tours.

ACES has magnificently involved the faculty members to act as motivators, advisors and mentors so that the club can get the best possible directions to make the activities more fruitful.

Special regards to Mr. Saniat Rahman Zishan, Mr. Sayed Muhammad Baker and Ms. Shahreen Hassan to be with ACES always supporting it and keep their footsteps in this prosperous pathway of ACES.

However, I wish ACES all the luck and hope this core club hold up its consistency and enrich itself as well as its members with substantial comprehension.



## Md. Saniat Rahman Zishan

Special Assistant (OSA),  
Assistant Professor, Faculty of Engineering, AIUB  
Mentor, ACES

If you can't fly, then run  
If you can't run, then walk  
If you can't walk, then crawl  
but, whatever you do,  
you have to keep moving forward.

-Martin Luther King Jr.

Making a firm agreement with the aforementioned invaluable lines, I would like to exploit the opportunity of sharing my journey with ACES: "AIUB Community of Engineering Students". The voyage started on 2014 with great zeal, passion and aspiration to achieve extravagant dreams. Through peaks and valleys, the community acquired its dreams and now its upholding its stiff position at the tip of success. Over the time, the ambitions got more sheer, bonds got more strong and firm and the urge to achieve more got more defined. With its dedication, hard-working and perseverance ACES has preserved its pivot agendas of organizing didactic seminars, work-shops and industrial tours which in turn have fruitful contribution to the society. One of the core aim of ACES is to cultivate communal connection with the alumni which has been taken care of with great importance. ACES is now undeniably one of the most acknowledged and prosperous club under EEE department of AIUB. Working along with this great ACES family was, is and will always be a tremendous pleasure and the memories I have will always be cherished. I would like devote my highest gratitude to all the individuals who are associated with ACES team for their endless devotion over the years. I wish good luck to the ACES team and aspire that they will continue to provide excellent contribution in greater interest for the club, for the institution and over and above for the society.

# Sayed Muhammad Baker

Lecturer, Faculty of Engineering, AIUB

Motivator, ACES



One of the most wonderful things about AIUB Community of Engineering Students is the opportunity that it gives to a student to meet the needs for being a perfect Engineer. ACES offers the opportunities to the students to make themselves eligible for their professional life right after their study period. The community has been entirely working considering the betterment of the students since its birth. From the very beginning, the founding members and the governing body of ACES are doing their best to take the community to a new height and they have done it with their hard work and dedication.

Day by day ACES is growing higher both in name and fame. It has created a bridge for the students to fulfill their needs of having knowledge regarding recent trends of technology, industrial workloads and environments and a clear knowledge regarding higher studies and many more. ACES is approaching forward targeting its goal to serve the students along with the society. It is expanding in numbers in terms of members and it has been the most adorable community among the engineering students of AIUB.

I have been fortunate enough to be a part of AIUB Community of Engineering Students for last two years and it has been a great honor for me to serve the students as a motivator of ACES. The entire journey with ACES has been so remarkable for me from every aspects of my professional life.

At the end, I would like to wish a very good luck to ACES for its journey ahead and I would also like to give a huge appreciation to everyone who has been with ACES and meeting the needs of serving the students as the need is not abstract. It is urgent, and it is real. It makes us want to do everything that we can do to serve the students along with the society.

## **Shahreen Hassan**

**Lecturer, Faculty of Engineering, AIUB  
Motivator, ACES**



**A**s we hold the oars and sail in to the era of evolution, advancement in technology has changed the appearance of lives in every aspect. To keep pace with this global advancement, in education sector other than bookish knowledge, didactic activities are also very important. And thus it's important to promote extra curriculum activities that play an imperative role in personal as well as in professional aspects. And concerning about these activities, different clubs under the institution can pave the way through different formative exertions. American International University Bangladesh (AIUB) is not far aside in promoting this perception. AIUB has many different clubs for their students and I had the privilege to get myself embodied in ACES in 2015. My journey in ACES was very pleasant. This journey came to me with many ups and downs. In all respects, I have learned many things, conquered many of the desired goals. It's not only one's effort which has made ACES what it is now. All the name and fame that ACES has conquered came with the effort of the ACES TEAM. It's indeed a great pleasure to be a part of ACES family. I am delighted to see the progress that has been achieved so far. I would like to wish the entire ACES team all the luck. As we have a long journey ahead, so stay united, work with all your dedication perseverance and honesty. Always remember,

**GOOD TEAM BECOMES GREAT ONES,  
WHEN THE MEMBERS TRUST EACH OTHER ENOUGH TO SURRENDER  
THE "ME" FOR THE "WE"**



## Mohammad Rakin Imtiaz

Former Chairperson - 2014

### AIUB Community of Engineering Students (ACES)

It gives me great pleasure to know that ACES is finally publishing its first magazine, another step towards completing its promise made to the AIUB community and I feel honor-bound to be a part of it.

From day 1, ACES has been trying to present the AIUB community the immense world of the engineers with a different yet intriguing touch. Alhamdulillah, I am pleased to say the publication of this magazine is another huge step towards that goal. This magazine along with the various unorthodox events presented by ACES shows the dedication and hard work the team's providing to accomplish the various needs of the future engineers.

On a personal note, I am really grateful to each and every person of the ACES community for taking me not only as a chairperson but as a part of a big family. This team always works as a family which is one of the most important reasons behind ACES's success. The experience that ACES gave me and the honour the team showed was worth every second of my tenure and this not only gave me a lifelong of memories, but an unforgiveable tour. Finally, I want to make a request to the AIUB community. We are still newbies. We have had our faults. But it's like as they say "Failure is the Pillar of Success", and the team is trying their level best to fulfill your every demand. But it's also your responsibility to "Make the DEMAND". You make it, and we will definitely do every possible thing in our reach to fulfill it.

I wish all the best to each and every one of you. May you all have a great time reading through the pages.

# Suvro Russell Madhu

## Former Chairperson - 2015

### AIUB Community of Engineering Students (ACES)



I consider it's a privilege to be amongst such dedicated and talented people and even more honored to know that ACES is publishing its first magazine. I finally feel that I am a part of something big. Not that I didn't consider ACES to be a big platform to enrich my skills and knowledge to begin with, but over the years I have realized that the opportunities are bigger than I imagined. I finally grasped the big picture.

The experience of last year as the chairperson was truly phenomenal. Decision making has never been tougher. Distribution of tasks amidst other members was tough, as all of them were beyond capable of each task, so the only question that remained was, who to appoint for what. After the distribution of work, it was so easier for me, as every member gave their best in every task at hand.

The experiences that ACES provided me, is helping me with everything in my life, including my job. Socialization with people has never been easier, as ACES gave me the opportunity to work alongside some great members and supportive mentors.

In the end, I would say that it feels great to be a part of the first magazine of ACES and a journey that I won't forget for the miles I am yet to travel.

# Days With ACES....!!!

Just like a usual day, I arrived at the university campus around 7.45 a.m. for attending the regular morning classes where my eyes strolled over a colorful poster with the bulletin of "ACES MEMBER RECRUITMENT!!". The first question arised was Why being a part of it?? What are the activities of the club? And what actually is ACES?? Later that day I asked the very same questions to the volunteers and executives at the booth and the moment I got all my questions answered, I did not waste a single minute from becoming a member of the club. To briefly describe about ACES, it is the core club of EEE department organizing seminars, workshops, industrial tours, etc... During the 4th Orientation of ACES, we members were all literate about the activities that have been carried in throughout the year followed by the speeches of our respectable Dean, Honorable Mentor and Motivators. Knowing more about the club, I did not miss out the chance of grabbing the volunteer application form the moment it was being distributed. And this is where my expedition began with ACES. I was first assigned with the anchoring of ACES FOUNDATION DAY where I realized how much supporting can all the members be. And not to mention about the tremendous encouragement from our respected motivators; so much of fun, teamwork and leadership skills can definitely be achieved under a

roof!! Gradually the team organized seminars and workshops regarding the peak topics of the era followed by arranging farewell bidding to the graduates passing out with flying colors after successfully accomplishing the end goal of project and thesis. Among these we all were appointed with a certain task where at the beginning it was difficult to perform but slowly everything went on smooth. As the days are passing by we get a chance to polish ourselves with the knowledge we are taking either from our mistakes or from our triumph. ACES is basically working with many branches which is quite not possible to describe in few words here and my days with ACES cannot be precisely discussed either. I would like to conclude saying that the number of events including the fun-filled recreational tour at year end, meetings, workshops and seminars I've attended whether as a participant or a volunteer has helped me in enriching a bond between the members and motivators. One thing I've learned about ACES is we are 'ONE TEAM WITH MANY DREAMS' and this is where the motto of ACES lies.

WRITTEN By:  
RAWDAH  
MEMBER OF ACES

# A HYDROGEN CAR THAT SET THE RECORD FOR THE WORLD'S LONGEST CONTINUOUS JOURNEY

There's no doubt that electric cars have a big role to play in the future of personal transport, but they're not the only alternative to petrol-powered vehicles in the pipeline. Cars running on hydrogen fuel cells are also in development, and a new trial in London just showed how much potential they really have.

A Hyundai ix35 Fuel Cell car has just completed



a record-breaking 9,810-km(6,096-mile) unbroken trip around the M25 (the motorway that encircles the capital) over the course of six days, stopping only to top-up on fuel. Not only did the car achieve the longest continuous journey ever, it also travelled 643 km (400 miles) on one tank of hydrogen - further than any other fuel cell electric vehicle ever made. The trial was backed by the London Hydrogen Network Expansion project(LHNE) and is part of a broader push to promote the benefits of hydrogen-powered transportation, which include high efficiency, silent

operation, the elimination of greenhouse gases from the whole fuel production cycle, and water as the sole by-product. These cars are certainly good from the environment: the hydrogen itself can be produced from renewable sources such as water, and is then converted into electricity to drive an electric motor via a lithium-ion battery. Refuelling takes a matter of minutes too. What is needed now for accelerated adoption of hydrogen vehicles is for the policy makers to work with the industry to provide the right framework for the technology to become truly accepted by the public. Hyundai's car has actually been commercially available since 2014, while last year

Toyota introduced its Mirai FCEV (Fuel Cell Electric Vehicle). Honda's FCV Clarity is due to arrive at some point during 2016, while Mercedes, BMW, Volkswagen, and Audi are among several manufacturers known to be developing FCEVs for the future. The record-breaking journey was part of a designated Hydrogen Week, designed to raise awareness of the benefits of FCEVs. Meanwhile a fleet of eight hydrogen-powered buses have now clocked up more than 112,6540 km (700,000 miles) along a popular route in Central London.

Source : Science Alert

# AIUB Robotic Crew (ARC)

WRITTEN BY-

Ebad Zahir, Assistant Professor  
Special Assistant, Faculty of Engineering, AIUB

American International University – Bangladesh undergraduate engineering students this year put together a team of 17 members and entered the world's premier robotics competition for university students. The University Rover Challenge (URC) is held annually in the United States, and challenges student teams to design and build the next generation of Mars rovers that will one day work alongside astronauts exploring the Red Planet. In this 10th edition of the competition, a total of 63 teams entered to fight it out for the title. Students from 12 countries had put all their hopes and dreams into the qualifying stage, but only 30 teams from 7 countries were selected for the semi-final stage. These 30 teams traveled to the Mars Society's Mars Desert Research Station in southern Utah on June 2-4, 2016 and AIUB Robotic Crew achieved 8th position in University Rover Challenge (URC).

The team from AIUB calls themselves American International University – Bangladesh Robotic Crew (ARC) and their rover is proudly named ARC-71. Under the supervision of Asst. Prof. Ebad Zahir, ARC is the first team in Bangladesh that has qualified to the semifinal stage in their very first attempt. Led by their resourceful Team Leader, Mahfuzur Rahman, the team comprises 13 bright and hardworking students from the Electrical and Electronics Engineering Department of AIUB and 4 exceptionally talented stalwarts from the Computer Science Department of AIUB. The mechanical design of the rover was achieved by seven students managed by the diligent Ashik Sarker. While the software / hardware interface was successfully handled by the remaining members managed by the dedicated Abir Hossen. However, all the members of ARC share one common goal and that is to represent themselves, their alma mater and their nation, at the highest platform. With strong determination and work ethics, this team has grown in strength and confidence exponentially since they began their journey in January 2015. They believe that through this opportunity they will be part of something special and inspire the future generations to follow in their footsteps.



More detailed information about the team can be found at: <http://aiubroboticcrew.com>



# PROJECT MEMORY By-

## MD. ARIF ABADULLA SAMY

Alumni, AIUB | Member of ACES



Final year Thesis or Project is a must for every engineering for completion of their graduate degree. That's why it is always written on the cover page of every thesis book "in partial fulfillment of the requirements for the degree". Like all other engineering students, I along with my other three friends, Tafsir, Mukit and Rezwana started our project journey in Fall



Semester, 2013. The journey started under the supervision of Mr. Ebad Zahir, Assistant Professor in the Department of EEE, AIUB. The first obstacle of the journey was the topic; what should we do? Suddenly, Mukit came up with the lamest idea, to build a device controlled by brain, which made us think (along with sir) that he completely became mad! But the irony of the fate is that, as we could not come up with a feasible idea, we had to start with this dumbest idea. The first goal of our project was to detect a brain wave (if it is even possible!) and to light an LED (which was not at all possible!). Doing so, we divided our group in four parts, one for theoretical research (because he was nerd), one for software (because he was lazy), one for hardware (because he doesn't like to read) and one for arranging money (because she had a lot of money!). After starting our journey, we found out that, we are really dumb; we don't know anything about engineering! So, we started learning. But the learning also sometime became difficult, when we saw that the simplest 741 op-amp doesn't want to work in practical scenario. Even if it worked today, the whole set up won't work tomorrow! At one point, we were about to lose all of our hopes, even sir asked us to change our topic. But we were determined; we have to finish what we have started, in any circumstances!! So we started really working hard. We used to have classes from 8 am morning, we had to wait up to 5 pm noon to get a vacant laboratory to work, and used to work up to 8 pm night (because after that Masud Bhai used to kick us out). Now, when you work such hard, it never goes in vain, so as ours. Just before the

last submission day of progress report, we could detect brain wave and light an LED, with the difference of brain signals of relaxed and active mind, which was our first goal. Now, take a lesson, never complete your work before finishing of time, otherwise your supervisor will give you more work! When our supervisor saw that we have completed our goal at the first semester (which he didn't thought that we would), he told us to go for a bigger goal, to drive a wheelchair using brain waves (which was again nearly impossible!). For doing that we needed mechanical help for deforming a wheelchair and connecting motors with that. That's why we started visiting Nowabpoor, Dholakia and Bongshal almost every day. Visiting those places, we came to learn so many interesting things that we thought such visit should be made compulsory for every engineering student. But we really struggled with the motors. Because in our country, either small motors like driving line follower robots or the bigger motors which are to use in big industries are available, but not the motors to carry at least a man. We tried with several motors, but all ended up with burning the coils. Now, in every semester, our department is being decorated with new thesis posters. These posters are really lucrative to see, but other than decorating the campus they have some other hidden purposes. The idea is to transfer new ideas to the other students, and also to knowing to the juniors what there seniors have done. In our time, we came across a poster that showed that they had made an electrical wheelchair. So we contacted with them and borrowed their motors and our life really became easy! Now our wheelchair was functioning with brain waves. When touched the chair with one finger, it was being able to detect the touch sensation from our brain and started to go front. When touched the chair with one hand, it was being able to detect the touch sensation from our brain and started to go right. When touched the chair with two hands, it was being able to detect the touch sensation from our brain and started to go left. We struggled too much for this project, and like any other struggle, this also didn't go in vain. The result of this struggle came with the reward of getting the Vice Chancellors Award in 15th Convocation of AIUB. Other than this, we also got 1st prize in 2nd CNSER inter university project competition under international conference ICIEV in Dhaka University. We also were able to publish our hard work as a journal paper named 'Device Control Using Brain Waves' (available in Google scholar).

# "Speak Up" Project

## MEMORY BY- SAFAYET AHMED SIDDIQUE

### Alumni, AIUB | Member of ACES

It all started with a speech that our respected faculty, Mr. Ebad Zahir (Assistant Professor, Dept. of EEE, AIUB), gave in the seminar on Project and Thesis. He said "Always try to do something that will help people and try to build devices that are useful to society". At that time, I was in my final year of engineering and was

about to start my project and thesis. That speech changed my view on selecting a project topic. It made me think, what

can I develop that contributes to society? Hence I started my research. Then, I remembered that there was a team from AIUB that won the Microsoft Imagine Cup for a device that assists blind people. Right then I got an idea. Since they built a device for blind people, why not build something for speech impaired people? That is how I came up with the idea of my device which is now known as "SPEAK UP".

It was hard at the beginning because there were not many devices available for speech impaired people and I was not an expert on microcontroller. So, during the first two months, I learned microcontroller coding. My supervisor, Mr. Saniat Rahman Zishan (Assistant Professor, Dept. of EEE, AIUB), helped me immensely in overcoming this problem. He set up a meeting with an alumnus of AIUB, from whom I obtained a basic idea on microcontroller.

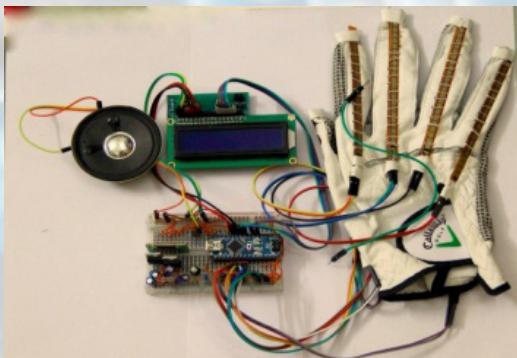
Normally, speech impaired people use American Sign Language (ASL) to communicate with normal people but most people do not understand ASL. So to overcome this problem, we designed a device that has the ability to convert specific hand gestures into audio and text commands. Here we used a memory card to save the audio commands. Then we saved the audio commands that are normally used in daily life. To broaden the communication process, we kept an option for user inputs. There are four gestures that are designed

for user inputs so that users can play his/her chosen audio commands using those gestures. This device not only helps a speech impaired person communicate with a normal person via audio commands, but also helps him/her communicate with a hearing impaired person through the text commands displayed on an LCD.

After the completion of this device, I received numerous recognitions from all over the country. My group ranked 2nd amongst 159 thesis and project groups in AIUB in 2014. In January 2015, I represented my university in a project exhibition organized by "Young Bangla" and "ESAB" in Chittagong. After that I was nominated for the "Joy Bangla Youth Award 2015". Out of 1500 nominees, only 30 were awarded out of which only 3 were awarded for their contribution towards research and innovation. I was lucky enough to win that prestigious award. Later, I represented my university at the "ICT EXPO 2015" with this device. Out of all of my achievements, the best one was receiving funding from "Access to Information

(A2i)" to develop more devices like mine and also improve the device's performance. In a workshop that was organized by "ESAB" at the Prime Minister's Office, I presented my device in front of "A2i". After filling the "Service Innovation Form (SIF)", I gave several presentations on my device and that was how I received funding from "A2i". Now I have the ability to help speech impaired people.

In the end, one thing has to be mentioned. If you have the right intention and desire to help people, you can do it, no matter how hard the work is.



# A Few Words from ACES Research Group

As AIUB is research based university, where project & thesis is paralleled to no other, demands a research environment from the core of its structure. Creating an environment for research on various engineering arena and associating students in national and international project competition is the ultimate goal of ACES Research Group. As a research group takes time and enormous effort, we, in our early ages, are working in designing systems using embedded systems. As of writing this article, four different projects using microcontrollers are implemented in hardware and one is implemented in simulation tools. Research paper on these projects are also in progress which are intended for submitting in international journals. One of the main challenges of ACES Research Group is managing time in busy institutional calendar but still enthusiasm of research group members make things possible. Our next resolution is including more research arena and competing national and international project competitions. Our research group is really thankful to the Department of EEE for all the support and inspiration.

WRITTEN BY-



Kazi Ahmed Asif Fuad

Lecturer, Faculty of Engineering, AIUB  
ACES Research Group Moderator

# Achievement of an ACES Research Group Member

**N**agib Mahfuz is a student of the Electrical and Electronics Engineering department in American International University- Bangladesh. He was born in Rajshahi. After finishing his higher secondary examinations, he enrolled himself in the university to pursue his higher education. He chose engineering because he was very passionate about it from an early stage. He was so passionate about electronics that he even started a small project by himself when he was very young. He loves the journey of learning and building, knowledge outside the textbooks, and solving real life problems innovatively.

He started his journey of innovation by creating electronics projects from the very early stages of his university life. He gathered basic knowledge related to microcontroller, circuits, and programming language from his course teachers, ACES Research Group and various sources. After a couple of months, he was able to build an autonomous robot that has the ability to detect faults in railway-tracks and send alert messages to the authority. He participated in Meccelaration 2015 organized by IUT with his robot named "An Autonomous crack detector robot for railway-track – Scanobot". A feature of his project was covered and broadcasted in Aljazeera.

After his big success, he was even more determined to create more projects that can solve real life problems and carry social value. Hence, he developed another project named "Object analyzer robot for security system". This robot ranked 3rd at the CS Fest 2015 held by the AIUB Computer Club and 1st at Telco Warfare 2015 held by East West University. Two back to back top prizes gave him even more energy and enthusiasm to keep on pursuing new and unique developments for the welfare of mankind.



Recently, he received recognition on a national level platform. His team won the 2nd runner up award at the Bangladesh ICT Expo-2016 hosted by the ICT division of the government of the republic of Bangladesh. It was a very prestigious event. The award was handed over at the gala event of the fair by the additional director of ICT ministry, Mr. Sushanta Kumar Shaha. His project was considered the 3rd best project in the robotics and innovation category. It was a three day event where thousands of technology loving people and experts were gathered in the hall of fame of BICC.

Currently, he is working on several projects regarding embedded systems, robotic arm, and advanced security systems. He is also working with the ACES research unit and is contributing his time and dedication to the field of research and innovation.

# Laser Innovations

Despite formidable challenges, innovation in the laser industry is accelerating faster than ever. The roots of modern laser technology go back to a burst of innovation in the years following Theodore Maiman's demonstration of the ruby laser in 1960. Most major types of lasers were first demonstrated in those early years, but their technology has advanced greatly since then and today is on a roll.

Lasers have achieved an amazing diversity in their first half century. Red laser pointers are commonplace as cat toys, trade-show giveaways, or bar-code readers in supermarkets. Hundreds of millions of diode lasers are mass-produced each year, vital parts of common consumer products like CD and DVD players.

Argon-fluoride excimer lasers, a type developed in the 1970s, perform refractive surgery and write the patterns on state-of-the-art electronic chips. And the defense industry has innovated with both small and giant lasers for range-finding and weapons.

## Three Approaches

Efforts to develop the first laser focused on three approaches to producing the population inversion needed to generate stimulated emission:

- Discharge excitation of a gas
- Optical pumping of an alkali metal vapor
- Optical pumping of a solid

Maiman succeeded in optical pumping of ruby because he understood the material and recognized that flashlamps could provide the high pump intensity needed to produce a population

inversion in ruby, a three-level laser. The first to extend Maiman's work were Peter Sorokin and Mirek Stevenson at the IBM T. J. Watson Research Laboratory (USA). They used flashlamp pumping to demonstrate the first four-level laser, uranium in calcium-fluoride crystals in November 1960. Because ruby is a three-level laser, with its lower laser level in the ground state, more than half of the light-emitting chromium atoms must be excited to produce a population inversion. Four-level lasers such as uranium don't require depopulation of the ground state, easing pump requirements. Uranium never

proved practical because it required cryogenic cooling, but it showed the way to developing four-level solid-state lasers.

The next big step in solid-state lasers was laser action on the 1.06-micrometer line of neodymium. The first demonstration was Nd-doped calcium tungstate, demonstrated in 1961 by L.F. Johnson and K. Nassau at Bell Labs (USA). Later that year, Elias Snitzer at American Optical showed that a thin glass rod doped with neodymium also could lase. Neodymium had particularly good laser properties; developers studied many

other crystalline hosts. The winner of the first round of laser crystal development was Nd-doped YAG, with laser action first demonstrated in 1964 by J. E. Geusic, H. M. Marcus and L. G. Van Uitert of Bell Labs. Snitzer's work also sowed the seeds for another technology that would blossom much later: fiber lasers. American Optical had hired him to work on fiber optics, and his first efforts to demonstrate lasers had been in optical fibers with their cores doped with rare earth elements.

## CW Gas Lasers

The first continuous-wave laser was demonstrated 12 December 1960 by Ali Javan, William Bennett, and Donald Herriott at Bell Labs. They used an electric discharge to excite a mixture of helium



Test engineers monitor Northrop Grumman's Joint High Power Solid State Laser Phase 3 system earlier this year. The diode-pumped neodymium laser weapon is being developed for the U.S. military.

and neon to emit on the 1.15-μm line of neon. The experiment was a tough one and took nearly a year for others to replicate. But being able to generate a coherent beam made it possible to align flat-cavity mirrors parallel with each other in a Fabry-Perot cavity, making it easier to demonstrate other gas lasers. The next big step in gas lasers came in 1962 when Alan White and J. Dane Rigden made a He-Ne laser oscillating on the 632.8-nanometer red transition. A visible continuous-wave laser opened the door to many new applications. Emmett Leith and Juris Upatnieks at the University of Michigan's Willow Run

Laboratory (USA) used the red laser to make the first three-dimensional laser holograms. Spectra-Physics and Optics Technology Inc. soon were manufacturing red He-Ne lasers to sell for research and commercial applications.

Other types of discharge-powered gas lasers soon followed. In 1963, C. Kumar N. Patel of Bell Labs decided that exciting laser action on vibrational transitions of molecules should produce higher power than atomic transitions. His first choice was carbon dioxide, and on his first try he got tens of milliwatts on the 10.6- $\mu\text{m}$  line, a big increment for early gas lasers.

Adding nitrogen raised the output to 10 watts, enough to attract military interest. Military contractors built giant versions, eventually reaching 8.8 kilowatts in a monster with a 230-meter beam path. The breakthrough to tens of kilowatts came when Ed Gerry and Arthur Kantrowitz of the Avco Everett Research Laboratory (USA) demonstrated the gas-dynamic CO<sub>2</sub> laser in 1966, a development that remained classified until 1970, when those lasers reached 100 kW.

### Vapor Lasers

Meanwhile, discharge excitation spawned a large family of ion and metal-vapor lasers emitting at modest powers in the visible and near ultraviolet, notably argon, krypton, helium-cadmium, and copper vapor.

Steve Jacobs, Paul Rabinowitz, and Gordon Gould at TRG Inc. (USA) demonstrated optical pumping of cesium vapor in 1962, but optical pumping of metal vapors proved impractical.

However, in 1966 Sorokin showed that organic dyes dissolved in liquids could be optically pumped, and Bernard Soffer at Korad (USA) soon took advantage of dyes' broad bandwidth to develop dye lasers tunable across a broad range, leading to breakthroughs in laser spectroscopy.

### Semiconductor Diode Lasers

Semiconductor diode lasers were late

bloomers. Robert Hall of the General Electric R&D Labs made the first one in 1962 and was followed within weeks by three other groups. But their lasers required cryogenic cooling and couldn't emit continuously. It wasn't until 1970 that development of semiconductor heterojunctions allowed room temperature operation for a few seconds, with Zhores Alferov of Russia's Ioffe Institute narrowly beating Bell Labs. It took more years of painstaking development to extend lifetimes enough to make diode lasers usable. When Laser Diode Laboratories (USA) introduced the first commercial room-temperature CW

packed arrays that when cooled can crank out kilowatts of light.

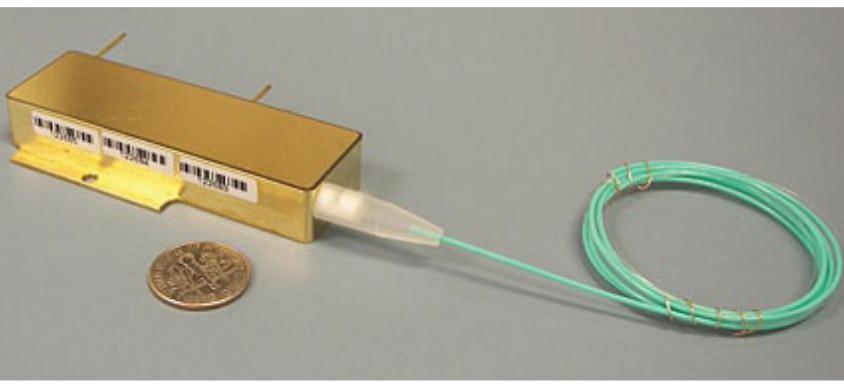
### Uses of Lasers Today

Today 808-nm GaAs lasers have become common pump sources for solid-state neodymium lasers, replacing lamp pumping for many applications because diode pumping is far more efficient.

The range of diode-laser applications is broad and amazing at both extremes. It's remarkable to see diode-pumped, frequency-doubled neodymium lasers packaged in pen-sized, battery-powered green laser pointers available on the Internet for under \$50 US.

Early this year, Northrop Grumman demonstrated a massive diode-pumped neodymium laser that generated a 105-kW beam for five solid minutes. The next steps in the military-sponsored program are field trials against potential targets and developing a version compact enough to be used as a plane- or truck-mounted high-energy laser weapon.

Diode pumping and fiber-optic communications also helped fiber lasers into the mainstream. David Payne's experiments with erbium-



In contrast to some of the larger laser systems, IPG Photonics has a new diode laser for plastic and metal welding, brazing, cladding, and medical applications that comes in the smallest package available on the market. This laser offers a choice of wavelengths across the 9xx nm spectral range and delivers 100W power out of a 0.12 NA, 105- $\mu\text{m}$  core fiber.

diode laser in 1975, it was rated to emit around a few milliwatts for a few thousand hours, and cost a few thousand dollars (US). By then, diode laser technology was advancing rapidly, powered by interest in fiber-optic communication systems. The first generation of fiber-optic systems used gallium-arsenide lasers emitting at 850 nanometers, but just as Bell Labs reported extrapolated lifetimes of a million hours for GaAs lasers, Masaharu Horiguchi of NTT (Japan) opened lower-loss fiber windows at 1300 and 1550 nm. J. Jim Hsieh of MIT Lincoln Laboratory (USA) developed InGaAsP diode lasers emitting in those windows, then started his own company, Lasertron, to manufacture them.

GaAs lasers found different niches. The biggest one in numbers is optical data storage on audio CDs and CD-ROMs. GaAs lasers also can be assembled into closely

fiber lasers at Southampton University (UK) led to the development of fiber amplifiers for the 1550-nm communications window, where they became part of the backbone of the global telecommunications network. Meanwhile, ytterbium-doped fiber lasers emitting have carved out a niche in industrial materials processing, delivering hundreds or thousands of watts.

IPG Photonics (USA) just reported a staggering 10 kilowatts from a single-mode fiber laser. Multimode fiber lasers have reached 50 kW, and incredible as it seems are in the running for use as short-range laser weapons because of their small size and high efficiency.

**Author:** Jeff Hecht

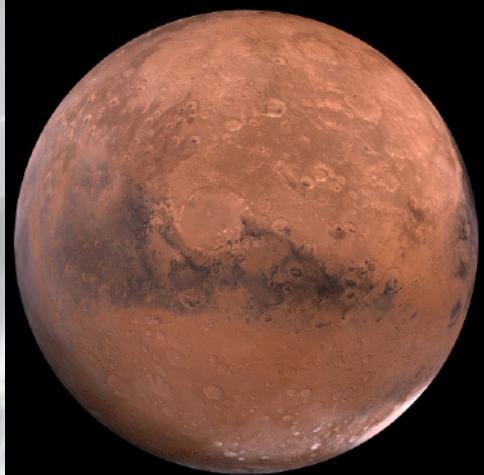
**EDITED BY -**

KEFAYET ULLAH

**MEMBER OF ACES**

# "Is it really possible to live on the Mars?"

We all are familiar with the science fiction film "The Martian" which was based on Andy Weir's 2011 novel "The Martian" starring Matt Damon. When the movie was released, the first question that hit everyone's mind is, "Is that really possible growing crops in the Mars and live there like the Earth?"



Well, in this article I tried to find the answer of that question. Before that, let's explore some amazing facts about Th is Red Planet.

Mars is fourth planet from the Sun and the second smallest planet in

degrees, or halfway across the equator. On the top of these layers, the caps of ice of water remain frozen all year round. The total volume of ice and adjacent layer deposits amounts to 1.6 million cubic km. Wooh! That's huge amount of ice for an ice cream lover.

## RELATIVE SIMILARITY TO EARTH

Earth is similar to its "sister planet" Venus in bulk composition, size and surface gravity, but Mars's similarities to Earth are more compelling when considering colonization. These include:

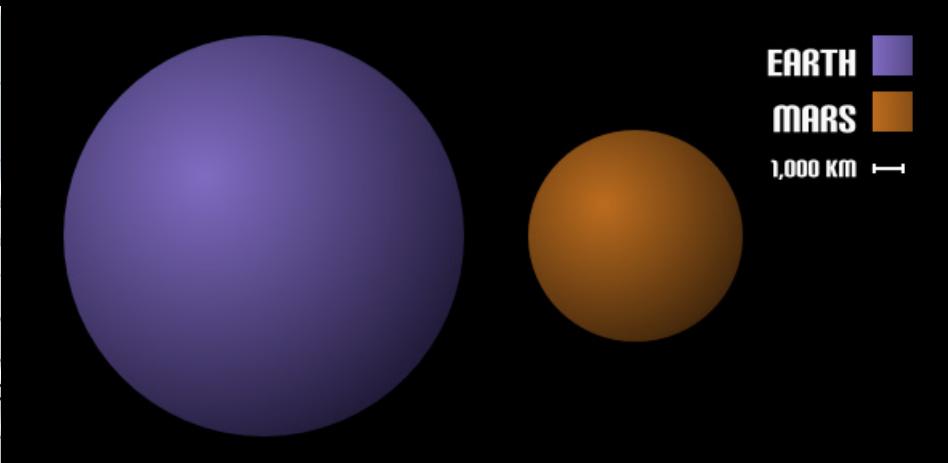
- The Martian day (or sol) is very close in duration to Earth's. A solar day on Mars is 24 hours, 39 minutes and 35.244 seconds.
- Mars has a surface area that is 28.4% of Earth's, only slightly less than the amount of dry land on Earth (which is 29.2% of Earth's surface). Mars has half the radius of Earth and only one-tenth the mass. This means that it has a smaller volume (~15%) and lower average density than Earth.

the Solar System. Mars is titled the "Red Planet" on account of its reddish appearance rendered by the thick layer of iron oxide prevalent on the surface. Mars is approximately 53% of the size of Earth with gravity 38% of that of the Earth. Though this planet is much smaller than any planet, surprising fact is, it accommodates the largest volcano in the Solar System, including Olympus Mons which is about 370 miles (600 km) in diameter. Moreover, Mars has the flattest, smoothest places found in the Solar System which is situated at the lowest of its Northern Plains. It was potentially created by water that once flowed in that region.

## THE ATMOSPHERE AND THE ENVIRONMENT OF THE MARS

The atmosphere on Mars is thin and cannot retain heat energy. The average temperature is about -80 degrees Farenheit (-60 degrees Celsius). However, temperature can vary from -195 degrees Farenheit (-125 degrees Celsius) near the poles during winter to 70 degrees Farenheit (20 degrees Celsius). Which seems not so cool enough for human being.

Mars has two permanent polar ice caps. During winter, Mars remains in dark areas, fostering depositions of 25% to 30% of the atmosphere in slabs of carbon di-oxide (dry ice); these frosts can extend from the poles to the latitudes, as low as 45



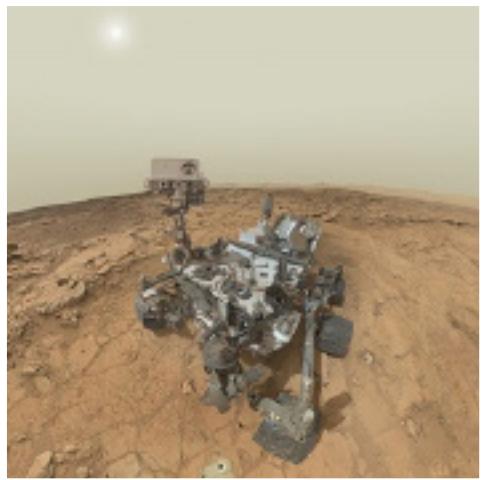
• Mars has an axial tilt of 25.19°, similar to Earth's 23.44°. As a result, Mars has seasons much like Earth, though they last nearly twice as long because the Martian year is about 1.88 Earth years. The Martian north pole currently points at Cygnus, not Ursa Minor like Earth's.

• Recent observations by NASA's Mars Reconnaissance Orbiter, ESA's Mars Express and NASA's Phoenix Lander confirm the presence of water ice on Mars.

## DOES "THE MARTIAN" MOVIE MEETS THE REALITY

When Andy Weir wrote the novel The Martian, he strove to present the science correctly and used reader feedback to

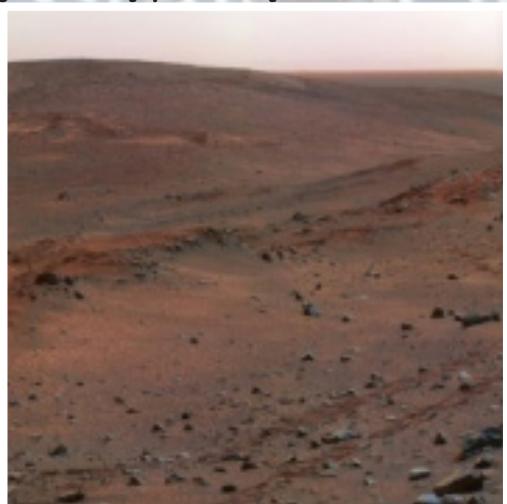
get it right. When Ridley Scott began directing the film, he also sought to make it realistic and received help from James L. Green, the Director of the Planetary Science Division at NASA. Green put together teams to answer scientific questions that Scott asked. Green said, "The Martian is reasonably realistic", though he said the film's hazardous dust storm, despite reaching speeds of 120 miles per hour (190 km/h) would in reality have weak force. The process used by the character Watney to produce water was accurate and is being used by NASA for a planned Martian



rover. The radio isotope thermoelectric generator was also appropriately used for heat. When his rations begin to run low, Watney builds an improvised garden using Martian soil and the crew's feces as a fertilizer. "We could probably grow something on Mars", says Dr. Michael Shara, curator, Department of Astrophysics, Division of Physical Sciences at the American Museum of Natural History. It is also thought possible that microbial organisms could potentially live on Mars.

#### PEOPLE WHO ARE WORKING BEHIND IT

All of the early human missions to Mars as conceived by national governmental space programs such as those being tentatively planned by NASA, FKA and ESA would



not be direct precursors to colonization. They are intended solely as exploration missions, as the Apollo missions to the Moon were not planned to be sites of a permanent base.

Colonization requires the establishment of permanent bases that have potential for self-expansion. A famous proposal for building such bases is the Mars Direct and the Semi-Direct plans, advocated by Robert Zubrin.

On the other hand, Buzz Aldrin, the second man landed on the Moon, is working with the Florida Institute of Technology (FIT) to develop what he calls "a master plan" to colonize Mars in just 25 years. He was speaking yesterday at a signing ceremony to establish the Buzz Aldrin Space Institute at FIT in Melbourne, Florida, this fall.

Aldrin's proposal is called Cycling Pathways to Occupy Mars. It involves using the Moon, asteroids and the Martian moon Phobos as stepping stones to getting to the surface. He envisages that crews would rotate between Mars and Earth every 10 years. But he stressed that it wouldn't be "one-way trips;" rather, people would be able to come and go.

Of course, NASA themselves are working on a plan to get to Mars, which is not too dissimilar to Aldrin's proposal; they plan to visit an asteroid next year, before beginning missions to Mars in the 2030s. However, Aldrin's proposal includes a return to the Moon and missions to Phobos, things that are not on NASA's agenda at the moment but are being considered.

Whether NASA would use Aldrin's plan, which he is hoping for, is debatable. But there's little doubt that missions to Mars are gathering pace. And, of course, we have Andy Weir's movie The Martian to look forward to in October, which is a pretty accurate fictionalization of what future Mars missions might look like.

However, none of the projects still can not guarantee the colonization of Mars. But still we can hope for the best, who knows what is written on the future?

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#### WRITTEN BY:-

CHOWDHURY MIFTAH MAHMOOD SAGIR  
MEMBER OF ACES

# ACES DAY

AIUB Engineering Jubilation Week was a five day long event where all the club of EEE Department arranged the event. The second day of this event was organized by AIUB Community of Engineering Students-ACES where all the volunteers of ACES tried their level best to make this day a successful one. So the day started off with the participation of quite a decent number of enthusiastic participants. At the beginning of the first event for the day, the ACES promo video was put on for everyone to know the club that was hosting the days' event. Furthermore, the beginning of the day was enlightened by the compassionate words by the guest speakers and they were the ones to inaugurate the first event for the day which was the Arduino Microcontroller Contest. Consecutively another event was being held in the adjacent room. This event was all about the creativeness on an individual, and how they portray their thoughts in a single snap.



This event was the Photo Exhibition, where over more than 18 pictures made it to the gallery and out of which our judges picked the preeminent three. The very next event was a complex one. It involved the participants to solve problems as quickly as they can. It was truly was a contest of

who can brainstorm faster than the others. The event was judged by the Faculties and the name of the event was C programming Contest. The succeeding event was an entertaining one and the number of passionate participants were

h u g e .



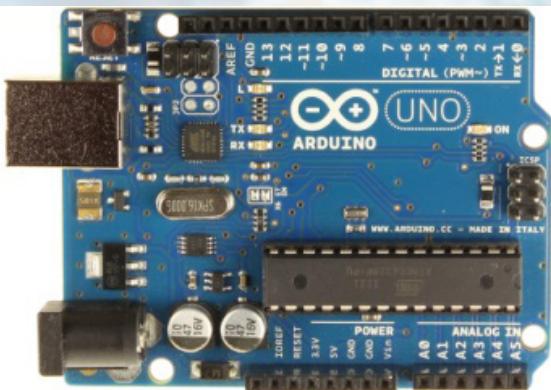
This event was a gaming contest called NFS Most Wanted Contest. One by one the knockout matches continued and in the end only two passed on to the last phase. The anticipation was phenomenal as few of the faculty members also visited the competition to encourage the finalists. Soon the last event of the day had finally arrived, it was a Math Quiz Contest where participants of different batches attended the contest. After the quiz contest, the judges gave pleasant speeches and inspiring advises to the participants for their future higher studies and on scopes and applications of mathematics in real life.

This is how the day ended smoothly with a lot of precious comments from the judges and remarkable feedbacks from all the participants for the next jubilation. Last but not the least, the day wouldn't have been so profound and successful without the massive efforts by the volunteers of AEJ.

# ARDUINO Vs Raspberry Pi

## ARDUINO

Mainly, it is a microcontroller. It comes from Italy. It was named after the Bar where the inventor of arduino, Mr. Massimo Banzi & his friends got the idea. Mr. Banzi, a



teacher of Interaction Design Institute Ivrea, wanted a simple hardware based prototyping tools for his students.

## RASPBERRY PI

In one word, it is a pc in smaller format. It has processor, ram, rom .It is born at University of Cambridge in United Kingdom by Mr. Eben Upton & his colleagues. The main goal for invention of raspberry pi was designed to be cheap and it would be a hackable computer for improving tinker skills. The prototype was invented on 2006 and officially came to the market on April, 2012. Now, we will discuss about the hardware and software side.

Arduino and Raspberry Pi both of their size & price are comparable, tiny and cheap. Here, Pi is 40 times faster and 128000 times more ram than arduino. Pi is an independent computer that can run with Linux operating system. It has multitasking support that means we can run different program at a time where arduino run a single program. Pi also wirelessly connect to the internet that means you can control it any side of the world. On the other hand, arduino IDE is easier than arduino run a single program. Pi also wirelessly connect to the internet that means you can control it any side of the world.

On the other hand, arduino IDE is easier than Linux. Arduino have "Real Time" and "Analog" capability that the Pi doesn't. This type of flexibility makes arduino easier to work with any kind of sensors. Arduino is easy to shut down, just unplug it. But, Pi can be damaged by unplugging it without proper

shutdown. The code writing is easier in Arduino where Pi's code writing is Linux based ,C++,Python.



On the software basis, pi is better than arduino. But if we think about the hardware based work, then arduino is first choice. Now, we can understand that Arduino and Raspberry pi are not alternative with each other. Both are different and essential with their field of work. So as a student we should work with both of these device. But in learning level, Arduino will be easier for us, then Raspberry Pi.

| Specification | Arduino           | Raspberry Pi                       |
|---------------|-------------------|------------------------------------|
| Input voltage | 7 to 12 v         | 5v                                 |
| Size          | 7.6cm*1.9cm*6.4cm | 8.6cm*5.4cm*1.7cm                  |
| Memory        | 0.002MB           | 512MB                              |
| Clock speed   | 16MHz             | 700MHz                             |
| Multitasking  | No                | Yes                                |
| Networking    | None              | Ethernet                           |
| Memory        | 32kb              | SD card ( 2 to 16GB )              |
| USB           | One, input only   | Two, peripherals                   |
| OS            | None              | Linux                              |
| IDE           | Arduino           | Scratch, IDLE, anything with Linux |
| Price         | (500 - 3000)Tk    | (3000 - 4000)TK                    |

WRITTEN BY:  
BISWAS BISWAJIT  
MEMBER OF ACES

# Cartoons



ARTIST  
**NABILA MABRUBA**  
MEMBER OF ACE



# J . A . R . V . I . S

Do you watch Iron Man and think to yourself, "Man, it would be totally awesome if I had an electronic personal assistant like J.A.R.V.I.S."? Well one nerd took it upon himself to create just that.

While this isn't exactly movie news, maybe it'll inspire some of our more tech savvy readers to go buy a few sensors and circuits and toss something together like Chad Barraford did. According to , Barraford has wired his home to greet him upon entrance, announce the weather, track which Netflix he has at home, and even cook a hot dog in the Foreman grill. Before you wipe the "WOW" off your face, hear this. Thinking all other DLAs (digital life assistants) to be over priced and hokey, Barraford's system has only cost him \$691.98 which is approximately 45000 Tk to date. Sure his Jarvis won't show a digitally dismantled engine, or extinguish him after a failed flight in his Iron Man suit, but it will dim the lights and send alert emails to Chad's boss and girlfriend if Chad ever texts it with the news that he is coming home with a migraine. Still realistically awesome.



The system will do much more, like controlling the heat in the apartment, informing him on the whereabouts of his dog, and keeping him informed of the latest news stories. Shockingly, Barraford is self taught in the field of electronics. His degree is from UMASS-Dartmouth but is in psychology, about as far from IT work as you can get. He did almost all of this on his own,

which means you can too.

Looking for the true Iron Man experience? Then scrape up about 45000Tk, stalk Chad on Facebook and ask politely for instructions on how to turn a 4-year-old Mac Mini and a few extra components into a talking digital assistant to integrate into your life. Chad says he's not about to share his code just yet, but his concepts can be viewed at [ProjectJarvis.com](http://ProjectJarvis.com) if you're looking to be inspired. Be a man, be an Iron Man, and build yourself a J.A.R.V.I.S, and be the baddest mutha in your apartment complex.

WRITTEN BY:  
ABDUR RAHMAN SAJIB  
MEMBER OF ACES

# Humorous Talk

##1

**B**ill Gates: "So, how's heaven, Steve?"

Steve Jobs: "Great ! It just doesn't have any wall or fence."

Bill Gates: "So...?"

Steve Jobs: "So, we don't need any Windows and Gates. I'm sorry, Bill, I didn't mean to offend you."

Bill Gates: "It's ok Steve, but I heard a rumor."

Steve Jobs: "Oh, what rumor?"

Bill Gates: "That nobody is allowed to touch Apple there, and there are no Jobs in heaven."

Steve Jobs : "Oh no, definitely there are, but only no-pay Jobs. Therefore definitely no Bill in heaven as everything will be provided free...."

-TOWKIR AHMED  
MEMBER OF ACES

##2

## The Engineer and the Manager

A man is flying in a hot air balloon and realizes he is lost. He reduces height and spots a man down below. He lowers the balloon further and shouts, "Excuse me, can you help me? I promised my friend I would meet him half an hour ago, but I don't know where I am."

The man below says, "Yes. You are in a hot air balloon, hovering approximately 30 feet above this field. You are between 40 and 42 degrees N. latitude, and between 58 and 60 degrees W. longitude."

"You must be an engineer," says the balloonist.

"I am," replies the man. "How did you know?"

"Well," says the balloonist, "everything you have told me is technically correct, but I have no idea what to make of your information, and the fact is I am still lost."

The man below says "You must be a manager."

"I am," replies the balloonist, "but how did you know?"  
"Well," says the man, "you don't know where you are, or where you are going. You have made a promise which you have no idea how to keep, and you expect me to solve your problem. The fact is you are in the exact same position you were in before we met, but now it is somehow my fault."

-MD.NAHID HASAN  
MEMBER OF ACES

##3

Three lawyers and three engineers were travelling by train to a conference. At the station, each lawyer bought a ticket whereas the engineers bought only one ticket between them. 'How are you going to travel on a single ticket?' asked a lawyer. 'Wait and watch', answered one of the engineers. When they boarded the train, the lawyers took their seats, but the three engineers crammed into a toilet and closed the door behind them. Shortly after the train started, the ticket collector arrived. He knocked on the toilet door and asked, "Ticket, please." The door opened just a crack and a single arm emerged with a ticket in hand. The ticket collector took it and moved on. Seeing this, the lawyers decided to do the same thing on the return trip so when they arrived at the station they bought only one ticket. To their astonishment, the engineers didn't buy any. 'How are you going to travel without a ticket?' asked one of the perplexed lawyers. "Wait and watch", answered an engineer. In the train, the three engineers crammed into a toilet and the three lawyers into another nearby. Soon after the train started, one of the engineers got out of the toilet and walked to one where the lawyers were hiding. He knocked on the door and said, "Ticket, please..."

-ABDUR RAHMAN SAJIB  
MEMBER OF ACES

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Alumni Affair



**Md. Ariful Islam**  
Research & Publication Unit



**Sayedna Naeyna**  
Press & Publication



**Aymanur Rahman**  
HR



**Sanaul Hossain**  
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**Azizul Haque Faysal**  
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**Jubayer Rahman**  
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**Sabikun Nahar**  
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**Md. Yasin Arafat**  
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**Mohammed Istiaque Amin**  
Research Group Coordinator



**Md. Wahid-Uz Zaman**  
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**Roktim Kumar Pramanik**  
Alumni Affairs Coordinator

# ACES EXECUTIVES - 2016



**Sabbir Ahmed Shourov**  
IT



**Samiul Alim Anik**  
Logistic & Operation



**Md. Nahid Hasan**  
Human Resource



**Towneda Akhter Prema**  
Cultural Affairs & Community



**Tasbi Binta kibria**  
Press & Publication



**Indranee Mondal**  
Alumni Affairs



**Shafew Ansary**  
Cultural Affairs & Community



**Borshon sen**  
Planning & Development



**Nujhat Noshin**  
Public Relation



**MD. Shamsul Arefin Himel**  
Public Relation



**Wasif Ziauddin Mahmud**  
Alumni Affairs



**Rakibul Islam**  
Photojournalism

# ACES EXECUTIVES - 2016



**Rohit Saraff**  
Accounts & Finance



**Shumit Roy**  
Accounts & Finance



**MD. Rakib Hasan**  
Logistic & Operation



**Abdur Rahman Sajib**  
Planning & Development



**Nabila Mabruba**  
Press & Publication



**MD. Zyed Ibn Sadiq**  
Logistic & Operation



**Tahmina Akter**  
Human Resource



**Nagib Mahfuz**  
Research & Publication



**Mahmud Mozammel**  
Research & Publication



**S.M. Ragib Shahriar**  
Research & Publication



**Md. Faisal Al Islam**  
Photojournalism



**Bhuiyan Mohammad**  
Cultural Affairs & Community

# ACES EXECUTIVES - 2016



MD. Ashikur Rahman  
Logistic & Operation



Md. Ahsanul Haq  
Logistic & Operation

# ACES Volunteers - 2016



Md. Golam Sarowar  
IT



Monotosh Talukdar  
HR, PR & Publication, IT



Faisal Ahmed  
Logistic



Nitu Das  
Cultural and PR



Mir Sadif Ahmed  
Logistic



Rezoanul Bari Symon  
Research

# ACES Volunteers - 2016



Md. Minhazur Rahman  
Photojournalism



Nabiul Masnad Promi  
Logistic



Rawdah  
PR & Publication , Hosting



Tasneem Akhtar  
PR & publication , Hosting



S.M. Ariful Islam  
Research



Mahjabeen Ehsan Maisa  
Press and Publication,HR



Sadia Tazin  
IT

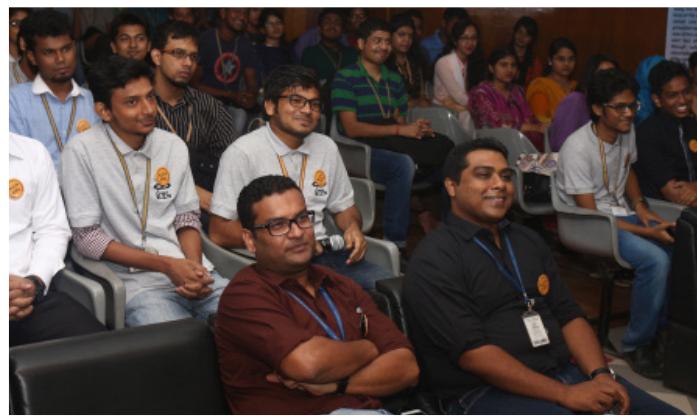


Md. Tanvir Hossain  
IT

# Activities of ACES

**3<sup>rd</sup> Orientation Program**





## Final Defence Spring 2014-15



# Industrial Tour at Pran-RFL Group



# Industrial Tour to Tongi Power Station





## Seminar on Future Internet Including 5G & Beyond



## Seminar on Industrial Process System by SHBE

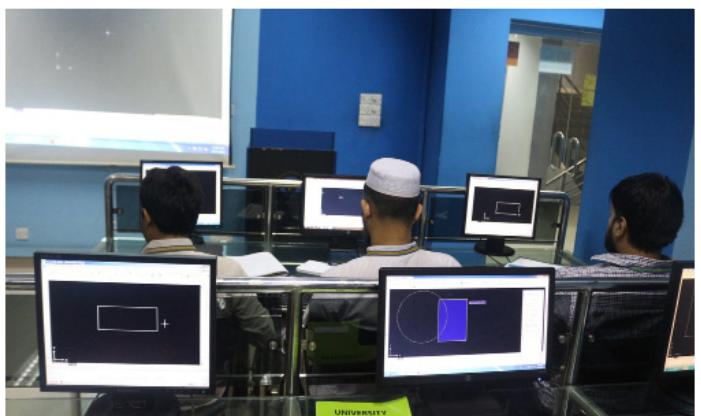




## Seminar on Project & Thesis-Inception & Impact



# Workshop on Basics of AutoCAD



# Workshop on PLC & Automation



# 4<sup>th</sup> Orientation of ACES - 2016



## 4<sup>th</sup> ACES Foundation Day ,April 2016



## BIOMEDICAL ENGINEERING RECENT TRENDS AND SCOPES IN RESEARCH AND HIGHER STUDIES



## SOLAR ENERGY AND THE SCOPE OF RESEARCH AND PUBLICATIONS



# A SEMINAR ON CAREER TALK



## AIUB ENGINEERING JUBILATION-2016



## Dockyard and Engineering Works Limited



## AN INDUSTRIAL TOUR TO "UNITED POWER GENERATION AND DISTRIBUTION COMPANY LTD. (UPGD)



## AN INDUSTRIAL TOUR TO RENATA LIMITED



## FINAL DEFENSE -FALL 2016



## WORKSHOP ON MATLAB & SIMULINK



## SEMINAR ON SIMULTANEOUS WAVELENGTH AND ORBITAL ANGULAR



# Comments About ACES

1. ACES helped me learn a lot of things and has given an opportunity to communicate with different types of people.  
~Md. Zyed Ibn Sadiq (14-26710-2)
2. ACES is more like my second family. I feel myself lucky to be part of such a family that I hope would last a lifetime.  
~Samiul Alim Anik (14-26738-2)
3. Everyone in ACES is more like the ace in a pack of card and they are the best there is, as a person, a friend, a mentor and a family.  
~Shafew Ansary (14-26731-2)
4. I am very lucky to be a part of such a community where there is a great bonding between the seniors, juniors, faculties and alumnae.  
~Towneda Akhter Prema (14-26739-2)
5. ACES is a special part of my life, and I have learned a lot from the seniors, juniors in this club.  
~Ashikur Rahman (14-25935-1)
6. ACES is that club that gives me the opportunity to be someone in the University life.  
~Roy Shumit (14-25795-1)
7. ACES is not only a family or Engineering community, it's a team with many dreams.  
~Sarwar, Md. Golam (14-27153-2)
8. Being in ACES, makes me feel like I have created a sort of family sort of relationship with everyone here.  
~Momy, Umme Hafsa. (15-29313-1)
9. I've gathered a lot of experiences just by being in ACES. 'ACES' means a lot to me.  
~Mondal, Indranee. (14-27275-2)
10. Being in ACES has improved my communication skill by a lot. So far it's been a great journey being with ACES.  
~ Kibria, Tasbi Binta (14-26978-2)
11. I believe in the quote "Teamwork divides the task and multiplies the success" and this is what I've learned from ACES. – The Teamwork!  
~ Rawdah. (15-28283-1)
12. You can't wait for inspiration. You have to go after it with a club; ACES gave me the opportunity to find my inspiration.  
~Sajib, Abdur Rahman (15-28333-1)
13. ACES is not just a club but a sky full of inspiration. Being with it not only makes you motivated, but takes you to heights you once thought unattainable.  
~Talukder, Monotosh (15-29683-2)

~ : THE END : ~  
~ : THANK YOU : ~

# 2017

## Vision of ACES

To be a professional student organization in providing excellent welfare and services as well as creating transformative experiences and responsible members.

## Mission of ACES

ACES targets 3 main areas :-

1. Fostering the professional advancement of all engineering students.
2. To increase engineering awareness through its programs and events.
3. To build up research group amongst the members and maintain a bridge between current members and alumni.