

Visiting Report



Submitted to
Afrel Co.Ltd.

By

Authors: Prof. Dr. Bishnu Prasad Gautam

Co-Authors: Sumit Pun Magar & Ito Ryohei

Faculty of Integrated Media, Department of Integrated Media

WAKHOK INNN, Wakkanai Hokusei Gakuen University

Part 1: Written by
Prof. Dr. Bishnu Prasad Gautam

Abstract

This report includes the feedback and opinion regarding CES 2019 event after the visit pursued by the participated members of WAKHOK-INNN team. This team got opportunity to visit CES 2019 in Las Vegas from Jan 8th to Jan 12th of 2019 after winning all three titles set for Garage Engineer Division in ETRobocon 2018. Those titles are IPA Award, Championship Award 208 and Best Championship Award 2018 namely. This report is divided into three parts. The first part covers not only about ETRobocon but also about CES 2019 and the impression that I got. I think this information is important to include in this report because there are very few resources about ETRobocon event in English. The second and third parts of the report are written by my students who have put focus more about CES 2019 and their impression about the event.

While it is almost impossible to cover everything in this report, we have tried to include the most impressive product and technology. Some of the innovations that inspired us were rollover screen displayed by LG, 5G connectivity, smart mobility and smart kitchen solutions. We enjoyed this trip and the innovations displayed in CES 2019 inspired us to enhance our innovations to a next level.

Contents

Part 1: Written by Prof. Dr. Bishnu Prasad Gautam	2
Abstract.....	3
Chapter 1: Introduction.....	5
1.1 About ETRobocon	5
1.2 Garage Engineer and CES Invitation.....	5
1.3 CES 2019.....	6
Chapter 2: Selected Observations and Impressions.....	7
2.1 Panasonic	7
2.2 LG	8
2.3 Smart Kitchen	9
2.4 Some Other Notable Products.....	10
Obviously, there were lots of other products which are not mentioned in this report. For example, a home brew beer machine, smart car and vehicles, Yamaha's bike, drones, sports machined developed by Omron, VR and AR devices developed by various starts up from around the world. Promotion regarding 8K TV's by top TV makers were giving extra global experience in the show	10
Chapter 3: Garage Engineer Experience Before and After.....	10
Chapter 4: Conclusion.....	11
Acknowledgement	12
.....	13
Part 2 : Written By Sumit Pun Magar (3 rd Year)	13
Part 3: Written By Ito Ryohei (4 th Year)	19
CES2019 視察レポート.....	20
稚内北星学園大学 INNN.....	20
伊藤 良平.....	20

Chapter 1: Introduction

1.1 About ETRobocon

ETRobocon is a Japan based robotic contest which has been organized every year since 2002 in order to provide educational opportunity for primary learners and engineers in the field of embedded system. In this contest a LEGO Mindstorm, an embedded software and hardware system is used. During the competition, LEGO runs over a designated course guided by designated program and algorithm embedded in it which is also equipped with various kinds of sensors. It is a contest in which participatory teams need to compete with the same hardware (LEGO Mindstorms) loaded with software analyzed and designed by UML.

It is an open participation type of contest which is organized in cooperation with industry, academia and government. It began as a UML Robot Contest in 2002, and changed its name to ET Robocon in 2005. ET Robotic contest is familiar with the name of "ET Robocon" in Japan, the term has been taken from "ET Software Design Robot Contest".

In 2018, it has organized a national championship contest in Pacifico Yokohama after selecting a best team from each regional contest held in Japan. The whole country is divided into 12 different regions and from each region best selected teams, (e.g 2-3) depending upon the size of the regions, were finally selected to participate in the national championship contest.

ETRobocon has 3 different divisions: primary advanced and garage engineers' division. The details of the contest, its rules and regulations are well described in the official site of ETRobocon.

1.2 Garage Engineer and CES Invitation

ETRobocon has three different kinds of categories: Primary division, Advanced Division and Garage Engineer Division. Primary division and advanced divisions are primarily based upon LEGO device; however, Garage Engineer division has no particular constraint of technology. Contestants are expected to produce and demonstrate any kind of moving electronics objects supported with IoT, AI and other cutting edge technology. This division offers challenging opportunities aimed at fostering next generation engineers who can bring new innovations. Participatory team can choose themes freely or can choose it according to pre-provided themes. The selection process is performed with two steps:

Step 1 (Video Review): The content of the system, its originality, impact and potentiality should be described in a 3 minutes long video clip. This video is submitted to the organizer of ETRobocon. Video will be screened and if the requirements are fulfilled, it will be published in you tube where each contestant can collect the vote from the viewers.

Step 2 (Performance Screening): Contestant need to present and demonstrate their system at the venue. Depending on its technical content, innovation and list of the devices, judges will

evaluate and give points to each team. Selected teams (at this time 4 teams) are required to present their innovation at the venue of National championship contest. On the basis of their performance, the best team is selected and best championship award would be provided. In the contest of 2018, our team (Wakkanai Hokusei Gakuen University INN) lead by myself has been selected and won all three titles. These titles are – IPA awards, Championship Award 2018 and Best Championship Award 2018. Furthermore, they have invited my team to participate in CES 2019 at Las Vegas. This is the main reason; a team led by myself visited CES 2019 during Jan 8th to Jan 12th. The following sections will describe the experience, initial impressions and the lesson learned from this visit.

1.3 CES 2019



Figure 1: WAKHOK-INNN in CES 2019, Las Vegas, USA

The visit team has three invited members including myself and one additional member from Wakkanai Hokusei Gakune University. The authors of this report are the invited members from ETRobocon 2018 Japan as the winner of Best Championship Award 2018. Among these members, two of them reached Las Vegas on 8th of January however I and one of my students have reached on the night of 9th Jan. Figure 1 shows the very first day of our CES observation in Las Vegas. This is how our journey has begun from ETRobocon to CES 2019.

Chapter 2: Selected Observations and Impressions

The major objectives of this visit were to participate in CES 2019, find out technological advancement and social impacts of those innovations to the future world. On the basis of this goal, I have found the following selected products and technologies valuable to elaborate in this report. It is not my target to cover every detail and the products in this short report. Thus, it is just covering the impactful product that may affect the future lives and the market of this industry.

2.1 Panasonic

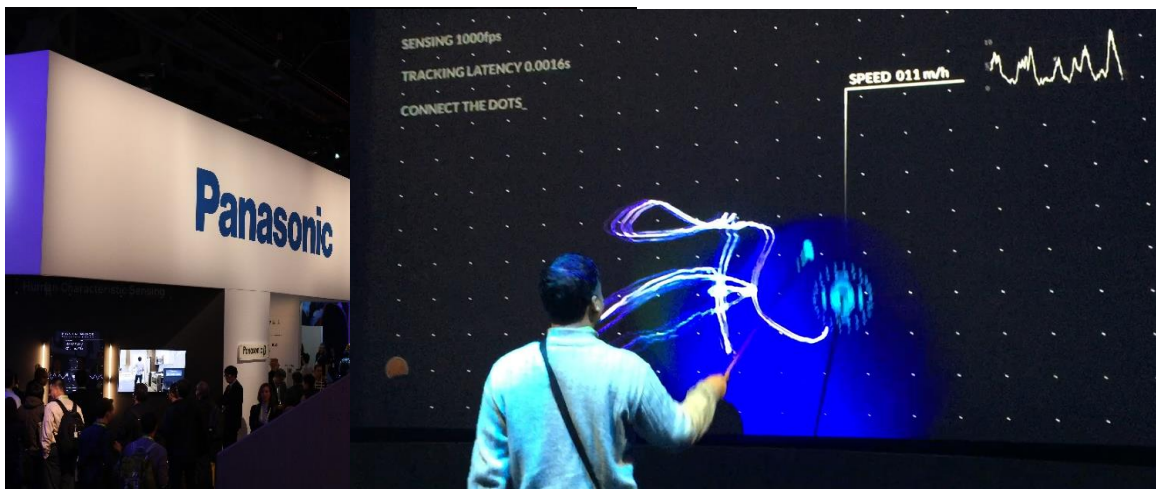


Figure 2: Real Time Motion Tracking in Panasonic

In the expo of Panasonic, it has revealed that they have achieved very high precision real time tracking which provides you a kind of immersive experience. For example, by moving a stick in front of the screen, I experienced a new kind of multimedia entertainment. This kind of experience has been possible by combining performers' movements and images using high speed tracking projection mapping that can measure location and process and project images in less than 0.002 seconds. Beside this expo, they had presented other booths also where they were showcasing their ideas of connected mobility, intelligent living spaces, and human insight technologies thereby combining physical and digital space with the real and the virtual worlds where you can create and experience new kind of digital world.

2.2 LG

One of the most impressive exhibitions that I found in this visit was the OLED display of LG. The South Korean company, LG electronics inc. It has demonstrated one of the greatest innovations in the middle of CES hall. A bendable screen having a length of more than 20 meters was spreading from the wall to the ceiling of the hall. A very impressive architecture followed by light illumination from it having immersive experience with its curved form was a memorable scenario. The curved screen with a curved trajectory was able to sustain a constant focus for the viewer. Figure 3 below is a snapshot of bendable OLED of LG taken from within the hall.

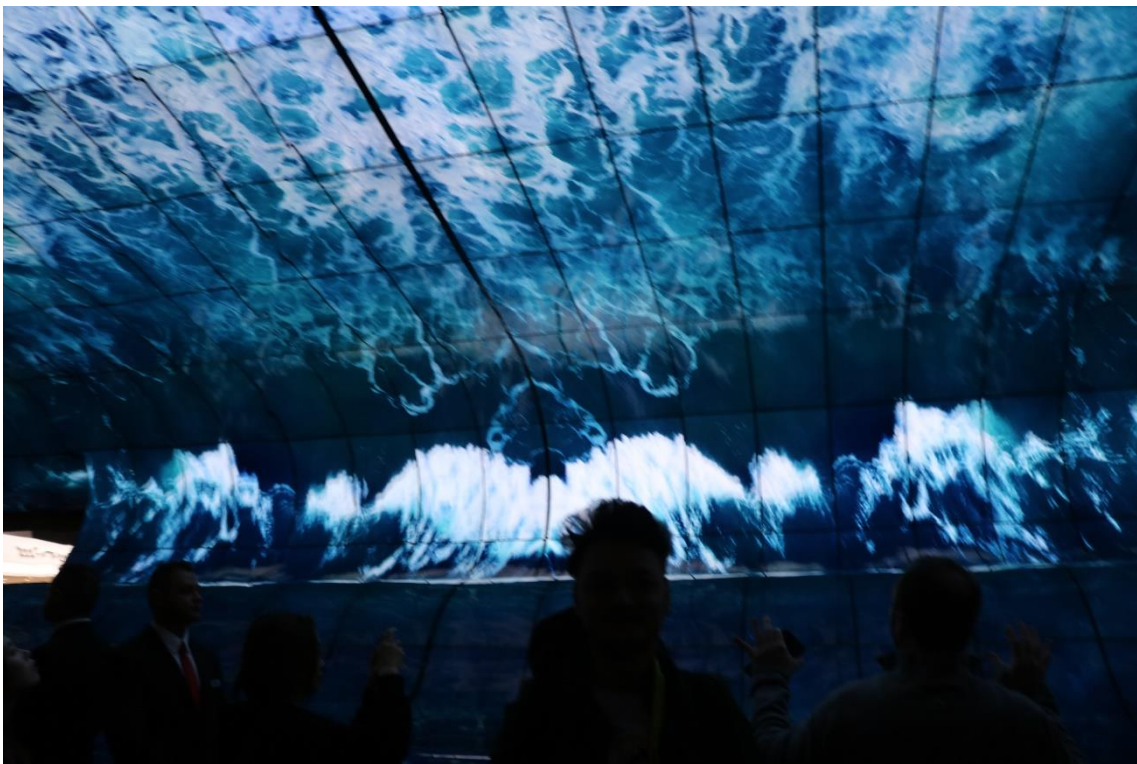


Figure 3: Bendable OLED Display of LG, an amazing and mesmerizing showcase

This technology can be applied in house hold TV, game and other multimedia devices also. Bendable OLED screens are a novel concept which produce a different experience to the viewers and can be controlled by pressing button that can shift the screen from flat to curved screen and vice versa. Viewers have choice of using flat or curve screen in the same set. LG has definitely showing its innovation of the future being a superior in OLED technology and its application. After observing their applications, the existence of other companies of this field seemed ineffective and less impressive.

2.3 Smart Kitchen

The other notable booth was about smart kitchen solutions. Starts up from China, Korea including LG have demonstrated their ideas making the venue a truly global experience. The major objective of this solution is to reduce the labor of the kitchen. Kitchen appliances such as refrigerator, oven and washing machine were connected to each other. The common things that smart kitchen can enhance a family's communication and ability to prepare great meals, be connected with their family members. However, these solutions should be made easier to handle. Otherwise user need to learn how to use smart home portal and other technical things.



Figure 4: Smart Kitchen Solutions

2.4 Some Other Notable Products



Figure 5: Home Brew Beer Device and Smart Mobility

Obviously, there were lots of other products which are not mentioned in this report. For example, a home brew beer machine, smart car and vehicles, Yamaha's bike, drones, sports machined developed by Omron, VR and AR devices developed by various starts up from around the world. Promotion regarding 8K TV's by top TV makers were giving extra global experience in the show.

Chapter 3: Garage Engineer Experience Before and After

In this event, I have met different people from different technological background. We have got many chances to share their ideas, views and experiences. In many of the talks, I found lots of hints of innovations that can contribute to improve our current project also. In some occasions, I had a chance to communicate with the exhibitors too. I also met some entrepreneurial startups from which my team got inspired regarding how to finish the prototype and make it a final product that can be deployed in the society.

I started a project Aamako Jato in my lab and later I involved few students in this project. I applied a couple of latest technology in this product such as IoT and voice control with the collaboration of few sensors. I first participated in a regional contest which was held in Wakkanai Hokusei Gakuen University and got some feedback from the officials of ETRobocon. They have encouraged us to participate in the final contest. Before participating to the Garage Engineers division, I have not heard much about ETRobocon.. However, after participating in

this event and after winning the prizes, our team is greatly encouraged. From my experience, I could say that this event is very crucial to enhance embedded technology of Japan with lots of innovations.

After participating in Garage Engineer Division of ETRobocon event and CES 2019, we have realized that our product can further be enhanced with the collaboration of other technologies too. For example, we are planning to utilize machine learning. We are also very hopeful that after launching 5G networks, the efficiency of Aamako Jato can be raised greatly. After successfully making it a final product, we will apply this platform and knowhow to other products and contribute to set up smart kitchen.

This kind of experience and encouragement was possible only after participating in Garage Engineer division of ETRobocon 2018. Being an academic, this event was a great experience not only for me but also for my students. The motivations of my students have been greatly fostered, and I hope that they would be more competent in the coming future. Moreover, other students in our University are also impressed by their experiences. This is definitely a positive impact in an academic term.

Though 2-3 days of visit to CES was not sufficient for us, my teams learn and are inspired by this event greatly. In the future, if the visit duration is increased 2-3 days more, there would be more time to review, analysis for the team.

Chapter 4: Conclusion

Observation of CES 2019 event at this time gave me a totally different impression than the other exhibitions that I ever visited. For example, I have visited a few ICT exhibitions in Nepal, Japan and other countries too. In comparison with those events, CES was a mammoth showcase having many of the latest tech innovations covering a large area of land. It has been stated that more than 4,500 exhibitors have participated in this event. The exhibition hall is spanned over 2.75 million net square feet of land. This is really a huge and most exciting event I ever seen. Furthermore, CES event management was also an exemplary from which we can take many lessons in terms of event management. This is the showcase for how to introduce products and applications and also show the future of the society.

Before participating to a CES 2019, myself and WAKHOK INNN has visited "ET exhibition" in Yokohama which was only about introducing the technology developed by small and medium size of Japanese ICT companies. That event did not cover the companies from around the world. After visiting CES 2019 in Las Vegas, each member has different impact and gets inspired by the new innovations and the products. In this context, we felt that participating in such kind of event is very important, however, it is true that this is not possible for many students and engineers as CES does not allow general participants and open only to the electronics trade, as

well as journalists, bloggers and business men. After visiting this event, we have a common question that could Japan take an initiative to organize such kind of multinational exhibition that can scale up to the level of CES? If this is possible to happen in the future, certainly, many students, engineers and other common people will be able to see the future of the technologies and the society in advance and such experience is very important to enhance the industries. These kinds of initiation would certainly benefits, academics, University, industries and the whole society.

Nonetheless, I hope that technologies and products developed in Japan are still in the mind of consumers from around the world and thus this trend will be continued in the future too. However, as in old days, the market is not guaranteed for Japanese companies. They should be more inclusive and need to recruit more foreign engineers and researchers so that they could compete with the outside world and recover the lost leadership. Definitely, in CES 2019 exhibition too, few Japanese companies were participating and demonstrating their existence. However, a sense of technological leadership was not found in the exhibition. Being an Asian, the encouraging things were that most of the innovative products were from Asian countries such as South Korea, China, Taiwan and Japan. I was quite surprised that there were almost no products and companies from India.

Finally, my impression was that in multimedia sector, Japanese companies are far behind than other companies.

Acknowledgement

I am deeply indebted to the organizer of ETRobocon and Afrel Co. Ltd, the sponsor of this visit. I would also like to thanks Wakkanai Hokusei Gakuen University who partly bare the expense of our visit.

Part 2 : Written By
Sumit Pun Magar (3rd Year)

Pun Magar Sumit
Wakkanai Hokusei Gakuen University
3rd year student Information Media

★About CES 2019

I participated in CES 2019 for 2 days from January 10 to January 11 and it was not enough to cover all the booths and event. However we were able to cover and visit almost 80% of CES 2019. CES 2019 was the very first CES I've ever experienced and I will definitely visit CES in future again and again. It would be interesting to write about the experiences and knowledge I got from CES 2019.



Figure 1: CES 2019

CES 2019 was the grand prize for us, Wakkanai Hokusei Gakuen Daigaku-INNN as the winner of ETRobocon 2018 Garage Engineer Division. As we was preparing for the trip to Las Vegas, I was excited for the experiences and knowledge I was going to gather at CES 2019. We landed on Las Vegas in late night on January 9 and checked in the hotel around 23:30 on January 9. Next day in the morning we went

to the Las Vegas Convention Center, venue for CES 2019 and spend whole day there. We also spend our next day in to the Las Vegas Convention Center visiting both we couldn't visit on previous day.

Before attending CES 2019 I found on the WEB that each year over 180,000 people attend it to experience the latest edge technology. As expected I saw crowds of people attending CES2019. The gadgets and technologies I had experienced there forced to think how it might change the lives of



Figure 2: Sensors for Smart Home

billions of people.

One of the my purposes of attending CES2019 was observing micro controllers, simulation gadgets and other gadgets that might help me on my graduate research project as I am a undergraduate student. I got many idea and hints for my upcoming research project which will surely be based on IoT. I was highly inspired by the smart kitchen by different brands such as LG which has given me a hint to make everything smart. I was highly influenced by Smart homes and smart transportation hubs, Drones for consumers and business, AI, VR and AR.

The things that I found amazing was LG's big curve OLED screen , LG's rolling OLED TV, Panasonic's Real time tracking and projection mapping, 5G, AI , Smart Kitchen and INTEL OUTSIDE.

LG has been always in front in OLED TVs for years, and it keeps coming up with innovative concepts. LG's big curve OLED screen called OLED Falls was the eye attracting show piece at CES 2019 as it was very big in size with amazing curve and sound effect. The OLED TV R is a roll able display TV that is incredibly thin and flexible. Its aluminum base looks like a table until you press ON button on remote then OLED panel from inside slides up, unrolling over about 10 seconds until it stands as a flat, 65-inch 4K TV. Another amazing LG's creation which was displayed on CES 2019 was Smart Kitchen fully equipped with smart home appliances with Google Assistant and Alexa.

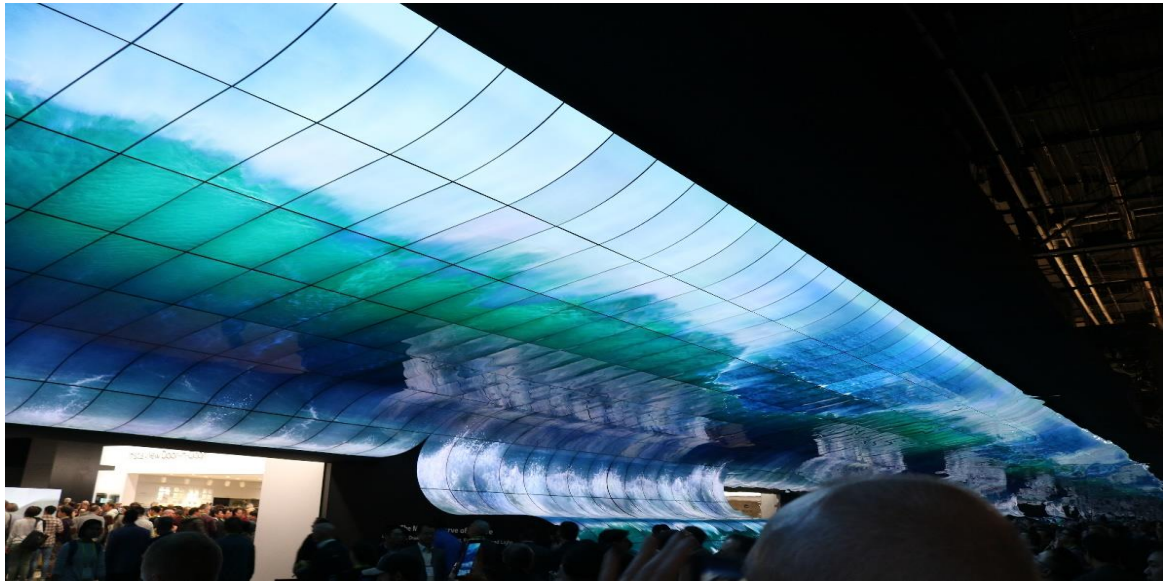


Figure 3: LG OLED FALLS

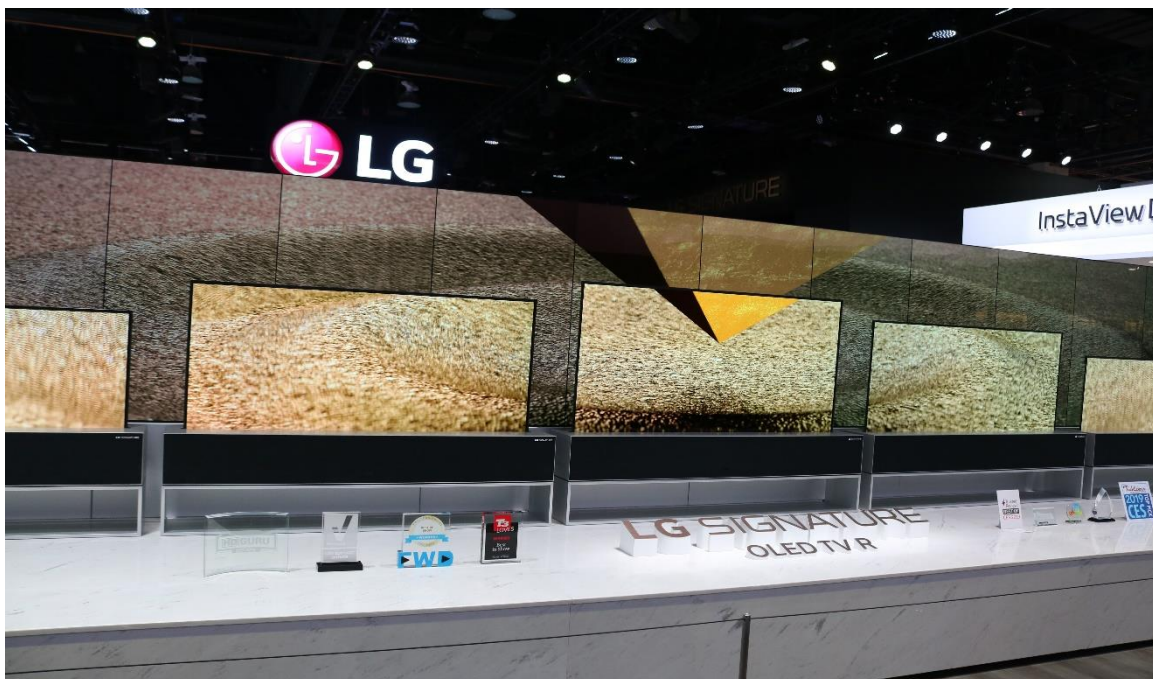


Figure 4: LG OLED TV R

empower the world outside (ref: <https://www.intel.com/content/www/us/en/events/intel-ces.html>)". 5G runs in Intel and it is planning to make its use in every sector such as Health, Smart media, Smart Industrial, Connected Transportation. The most interested thing about INTEL OUTSIDE its 5G will enables self-driving cars to communicate with connected infrastructure that will help the cars process sensor, safety, and other information for the car and return the results quickly to the cars.



Figure 5: INTEL OUTSIDE

CES 2019 was my very first visit to CES. Although I couldn't visit all the booths at CES 2019, I had great time there at Las Vegas learning different technologies evolving around the globe.

★About ET Robocon 2018 Garejjinia department



Figure 6: Wakaknai Hokusei Gakuen Daigaku-INNN with IPA Award

Reference: [稚内北星学園大学 wakhok×COC](http://wakhokxco.com)

ET Robocon 2018 Garejjinia department is an innovation contest which gives opportunities to young and beginner engineers to analyze challenge, design modeling and development, and

develop product and services which may help them to become a creative and innovative engineer in near future. As it is an open challenge anyone can participate in the competition including universities, organizations, companies, even individuals.

As I am a 3rd year undergraduate student studying Integrated Media, I was very happy to participate and accept the challenge at ET Robocon 2018 Garejginia department. ET Robocon 2018 Garejginia department was the first ever robotics competition I participated. That's why I was nervous as well as ready to give my best at the competition. Our team, Wakkanai Hokusei Gakuen Daigaku-INNN worked hard bringing Aamako Jato (traditional stone grinder with smart feature) to the top of the competition. Aamako Jato won the Best Championship Award along with General Championship Award and IPA Award. The feeling and the experiences I got from at ET Robocon 2018 can't be described in words as I got chance to meet with many peoples related with the IT field and got many ideas for design modelling and future challenges. After participating in ET Robocon 2018 Garejginia department I have gained more courage towards being an IT engineer with the aim to use IoT for making the life of human easier and use time more efficiently. That's why I have decided to work harder and accept the next challenge for next ET Robocon.

Before participating in ET Robocon 2018 I had some knowledge about CES as I watched clips of CES 2018 via internet which talked about the future of Bixby and Google Assistant. I was surprised after listening that we are going to CES 2019 after winning the competition because before that I had no idea that the winner gets chance to go to CES 2019. So, going to the CES 2019 was not the reason for participating in the in ET Robocon 2018 Garejginia department.

Both ET Robocon 2018 Garejginia department and CES 2019 was my first ever experience in their field. Both help me to gain and learn new experiences and knowledge about the existing technologies and future technologies.

---The End---

Part 3: Written By
Ito Ryohei (4th Year)

CES2019 視察レポート

稚内北星学園大学 INNN

伊藤 良平

私は1月8日からラスベガスで行われた CES2019 の視察をした。CES2019 の注目されている技術として「通信規格 5G」「LG のディスプレイ」「自動運転」の3つがあることを事前にリサーチしていた。

当日会場に行くと「とにかく広い」と感じた。広い会場に様々な企業が最新の技術を活かした製品がたくさんあるのだと興奮した。

私は最初に LG のディスプレイを見た。



LG は「曲がるディスプレイ」を大きく展示していた。

さらに奥に入ると曲がるディスプレイを使って「収納できるテレビ画面」の展示がされていた。

LG は展示の方法が他の企業と比べて非常に上手だと感じた。

上の写真はとても横の奥行きが広く見えるが実はそれほど大きくなく端にはミラーがあり、大きく見せているような工夫がされていた。

右の写真はディスプレイが収納されている様子だが後ろのディスプレイと組み合わせて収納されている様子がとてもわかりやすく展示されていた。



次は「通信規格 5G」を観た。

私はこの通信規格は主にスマートフォンで使われるもの
だと思っていた。

しかし実際には「自動運転」で使われていた。

5G はその通信速度の速さから速いスピードで動く車の
情報を取得し、処理をしていた。

ここで驚くべきことは「会場の周りを実際に走っている事」
だった。

日本だと同じようなことはほぼ不可能なことだと考えていたため
CES というイベントの規模の大きさがここではっきりとわかった。

また、5G に使われているモジュールも展示されており、他の企業が見たときにどうやって
自社製品に組み込むのかを考え安くなるのだと感じた。

Qualcomm は実際に使える技術を開発し、さらに開発した技術をどう使うかまでをデモン
ストレーションとして街中を走らせていたことを見ると「開発したモジュールを説明し、
さらに使用方法例」を示し、使ってもらう為の展示だと感じた。



今回の CES2019 で注目されているものは見終わったため、会場を散策すると多くの企業が「スマートホーム」が出展していた。



スマートホームはスマートスピーカーを通じて音声で家電の操作をする。稚内北星学園大学 INNN で作成したアマコジャトーに使えるのではないかと思いますしながら説明を聞いた。今ではスマートスピーカーがと対応した家電があれば家中の家電を操作できる。これからは自動運転とも相まって人の生活が豊かになっていくのだろうと感じた。しかし、最近日本でも話題になった IoT 危機へのクラッキングの対策も必要不可欠であり、もし悪意のある第三者に家電に侵入されたら場合の対処法も同時に考え、一般家庭に普及されることを望む。

最終日は自動運転が使われている Uber を使ってホテルまで帰った。

私は専用のアプリをダウンロードし、アカウントの作成をした。

右の写真は実際にアプリでタクシーを読んだ画面である。

Uber では自動運転が使われていると JTB のツアーオプションである

「CES2019 見どころ説明会」で説明されていたため、

期待をして待っていたが実際に乗ってみると自動運転は

全く使われていないように感じた。

やはり自動運転を使うためにはいくつか条件があるようでその条件は

「まっすぐな道路であること」、「周りに人や車がないこと」

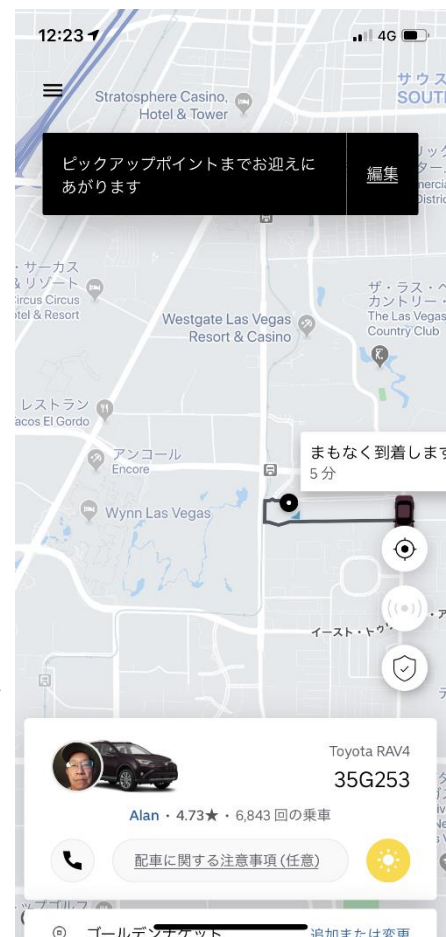
であった。

私が乗ったのは街中であつたために自動運転が使われなかったのだろう。

しかしもし条件にあてはまるようなところがあれば自動運転が使われる

ことを考えると自動運転自体も何とか頑張って社会で使えるように

しようとしているのだと感じた。



Visa Local Offers for Jan 10 - 16

Get Uber Cash by using your Visa card around town



ALEX AND ANI

10% back

今回の CES2019 の視察を終えて私は日本で行われた「ET 展」とは規模が全く違い、CES では開発したものの自体の紹介とその使い方、ほかの企業の物の組み合わせることでどのようなことができるかなど企業同士が協力してこれからの 社会をよりよくしていこうといったような雰囲気が感じられた。

一方で「ET 展」では各企業が開発した技術の紹介のみでせいぜい Arduino などの市販品と組み合わせて使う程度だった。

これからの将来はもちろん世界中で日本で開発された技術や製品が使われることを願っており、また自分自身も日本発の技術を開発したいと思うようになった。

そのためにはこれからまだまだ勉強をし、世界で行われている開発について知るためのアンテナを張り、情報収集をしようと感じた。

また、これからの ET ロボコンは私は進学するためまだ参加できるか定まっていないが、CES2019 でみた技術や発想を活かして何か開発、作成ができないか考えたい。

CES2019 を視察できたことはとても刺激となり、これからの「やってみたいこと」や「こんなのがあればいいな」といったようなものを考えるにあたり「どうすれば実現できるか」「どこの会社のどんな製品を使えばよいか」という考えの幅が広がった。