

CES 2020 주요 모빌리티 기업 전시 제품 및 서비스



Geneva has exotics. Detroit has muscle. Frankfurt has engineering. Vegas has the future.

(Nick Mokey, Digital Trends)

must read articles before CES

• 2019 CES Mobility Review

<u>The New Mobility Revolution(2019 CES)</u>

 Speakers : Amnon Shashua(Automotive Technology Correspondent, Reuters), Amnon Shashua(Senior VP, Intel), Chris Urmson(Co-Founder and CEO, Aurora), Deborah A.P. Hersman(President and CEO, National Safety Council), Alex Haag(CTO and Head of Technology, Autonomous Intelligent Driving a wholly owned subsidiary of AUDI AG), Johann Jungwirth(Executive VP Mobility Services, Volkswagen Group of America)

<u>CES 2019 Opens with Transformative Tech That Will Change Lives</u>

• CES 2020 Mobility Tech Talk Podcast

• The Power to Move Forward

- Speakers : Craig Rigby, (VP, Clarios) and Chris Robinson(Senior Analysis, Lux Research)

• A Smarter Vehicle is Safer Vehicle

- Speakers : (Phil Magney(Founder, VSI Labs), Mark Douglas(Field Software Solutions Architect, NXP Semiconductors), Robert Day (Director of Automotive Solutions and Platforms, Arm)

- Mobility Articles for CES 2020 from i3(it is innovation, CTA)
 - <u>New Ways to Interface With Cars</u> (2019. 6. 6.)
 - Future-Focused Automakers Turning to Startups (2019. 10. 7)
- Mobility Trends To Look For At CES 2020 (Fobes)
- CES 2020: Here's what you can expect to see at the world's biggest tech event(Techradar)
- Smart Cities/Vehicles to Headline CES 2020 (dealerscope)
- CES 2020: Mobility tech will go the extra mile to nix your need for a car (digitaltrends)
- CES 2020: What to expect from the world's largest consumer technology show (pocket-lint)
- What to expect from OnePlus at CES 2020 (digitaltrends)
- <u>'CES 2020' 국내 기업 관전포인트는? (데일리비즈온)</u>
- <u>미리 보는 CES: 2020년 주목할 5가지 기술 트렌드 (KOTRA)</u>

해외기업



New Mobility Ecosystem Strategy

New Ecosystem for Tokyo Olympic 2022

Walking Area BEVs(Battery Electric Vehicle)





- continuous operation range : 14km
- max speed : 2, 4, 6, 10 kph (variable speed)

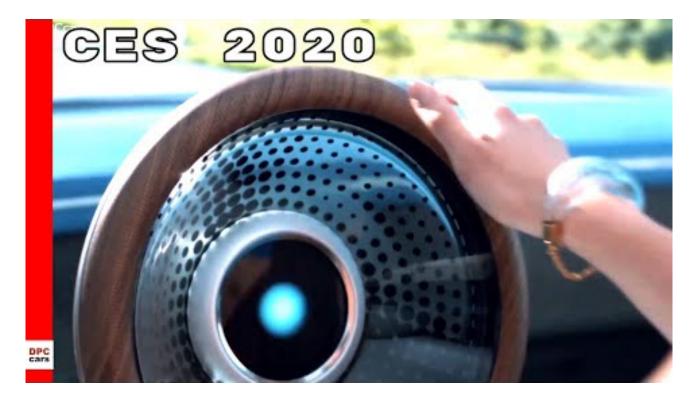
LQ Concept



- L4 autonomous vehicle
- next generation of concept-i (introduced CES/Tokyo motor show 2017)
- Auto-parking system for mobility limitation person
- Equipped on-vehicle systems such as cameras, sonar radar, 2D road mapping, cameras, R HUD
- Toyota Yui Project Tours (June to September 2020)

- Toyota AI Ventures, Toyota's US based venture capital firm, will feature several portfolio companies along with an overview of its investment direction.
- Toyota IP Solutions, Toyota's newly formed patent team will provide information about the benefits of licensing the impressive IP from Toyota's accomplished R&D efforts.

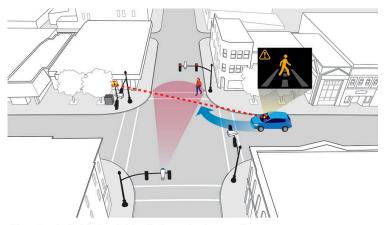
HONDA Honda – SAFE WARM, Augmented Driving Concept, and...



(reference) https://hondanews.com/en-US/honda-corporate/releases/release-e5acc507e4de63e57f698856f5008399-hondasvision-of-the-future-integrates-case-technologies-into-new-products-and-services-at-ces-2020

SAFE SWARM

Augmented Driving Concept



The system visually detects pedestrians that have entered a crosswalk area. A connected vehicle can warn the driver of a pedestrian crossing, even when they are not directly within line of sight.

Using V2X technology, Honda SAFE SWARM allows vehicles to communicate with surrounding vehicles and share key information such as location and speed. With this information, along with the sensor suite on the vehicle, the driver or automated vehicle systems can determine the safest course of action to prevent collisions and reduce traffic congestion. Over the past year, Honda has been evaluating SAFE SWARM in a real-world environment on the 33 Smart Mobility Corridor near the Honda R&D center in Ohio, and will show its progress in developing merge assist and lane optimization technologies.



Honda's Augmented Driving Concept features a seamless transition from autonomous to semi-autonomous driving operation. To respond quickly to the user's curiosity, the autonomous driving system is constantly on standby, ready to intervene and control the vehicle when needed. The driving system changes between automatic and manual mode with a switch, and features more than eight modes between fully autonomous and semi-autonomous operation. Various sensors in the vehicle continuously read the user's intention to smoothly shift between these modes, creating an instinctive driving experience. (reference) https://www.cnet.com/roadshow/news/honda-ces-concept-selfdriving-cars-augmented-driving/

Smartphone as Brain







HOUNDIFY oundHound Inc

Honda and Drivemode jointly developed "Smartphone as Brain" technology, which provides a safe and convenient way for drivers or motorcycle riders to integrate their smartphones into the driving and riding experience while minimizing distraction. For instance, riders can connect their smartphone and motorcycle by Bluetooth, enabling them to control their smartphone either using switches on the steering handles or voice recognition. Honda acquired Drivemode in October 2019, and will demonstrate Smartphone as Brain technology at CES.

(reference) https://global.honda/innovation/CES/2020/smartphone as brain.html

Honda and SoundHound Inc. have developed a voice-enabled AI conversational assistant – Honda Personal Assistant – to support drivers and enable a comfortable mobility experience. SoundHound Inc.'s Houndify voice AI platform includes patented Speech-to-Meaning[™] and Deep Meaning Understanding[™] technologies to deliver unprecedented speed and accuracy in voice recognition and responses, and an ability to understand context, such as the user's location or previous queries, to support natural interactions. Using the custom wake word "OK Honda" developed by SoundHound Inc., Honda Personal Assistant connects people with their mobility products and realizes a seamless world where various functions are controlled by voice only.

Future Honda Mobility VR Experience



Honda will preview a mobility ecosystem forecast for the year 2035 and beyond with fully autonomous vehicles, shared autonomous mobility, and an aerial mobility infrastructure. In the Future Honda Mobility VR demonstration, CES attendees can experience a journey through the urban future with a V2X system safely navigating the drive, encounter an Autonomous Shared Mobility Pod, and take flight in a personal vertical takeoff & landing (VTOL) vehicle.

(reference) https://global.honda/innovation/CES/2020/future_mobility.html

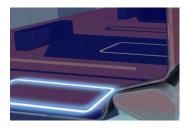


The Next step in mobility



Building and EV Energy Management

Can you reduce your office's electric bill while optimizing everyone's EV charging? Our Energy Management System carefully regulates car, grid, and building energy flow. With an AI that optimizes both EV batteries and a building's current draw based on utility pricing, power demand, weather forecast, temperature, holidays, and travel schedules, we send power in real-time exactly where it's needed. Smart City approved. <u>Read more.</u>



Bidirectional Wireless Power Transfer

By parking your EV over our charging pad, we charge your car with nearly the same efficiency as a plug-in cable – even when you're not directly over the pad, which can make other systems plummet in efficiency. Our charging pad can draw energy from the car too, just in case your Smart Home needs a boost. <u>Read</u> <u>more.</u>



Autovalet Summoning

Summoning an autonomous car is going to be a necessary feature of tomorrow's MaaS solutions. With our camera system, and congestion predictions, we ensure your autovalet isn't stuck in a traffic jam coming to get you. We use real-time crowd prediction too, making boarding and deliveries smoother. <u>Read more.</u>



Autonomous Perception

Piloting an autonomous car through a busy intersection stresses even the best self-driving systems. Our radar and camera fusion piloting system recognizes cars, pedestrians, and bicyclists even in bad weather or complex road geometries. We quickly compute real-time routes to avoid dozens of moving obstacles; exactly what you need to execute a dangerous intersection safely. <u>Read more.</u>



Driver Wellness Detection

For human-driven cars, the risk that a driver falls asleep, has a stroke, or experiences a heart attack may be low, but it's life threatening all the same. Our contactless system reads pulse rates, body temperature, and facial information to determine the health and awareness of the driver. We alert the driver by cooling the cabin, changing the lighting, or issuing audible alerts, and by contacting emergency services if the driver doesn't respond. Read more.



Speech Separation

Digital assistants are everywhere, but noisy vehicle interiors are still challenging – especially when multiple people are speaking. Our speech AI system uses patented speech algorithms, multi-microphone delays, and camera visuals to clearly separate distinct simultaneous voices and reduce noise, letting your cars hear and understand all occupants.

^{NISSAN} おもてなし(True Japanese Hospitality)-Future of Mobility to Life



Electric Ice Cream Van



Frosty treats dispensed by Nissan's zeroemission ice cream van

Ariya Concept Car





The Nissan Ariya Concept, bringing together advanced technologies on an all-new EV platform for North American debut

A golf ball inspired by Nissan's ProPILOT 2.0 advanced driver assistance technology, which guarantees you'll sink your putt each time

- Selfies taken at the speed of Nissan's Formula E race car
- Acoustic meta-materials that ensure a quiet cabin and a serene ride
- Displays of Nissan's new Formula E and the Nissan LEAF e+ electric vehicles



Booth 7914



팔로우

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Will you be at #CES2020? Schedule time to talk with our team about what it's like to work at Bell \rightarrow bell.co/CES-MEETBELLHR



오후 12:56 - 2019년 12월 19일



• A P T I V •

Future of Connectivity -5G and More

5G is launched in major markets around the world and already delivering on the promise of blazingly fast speeds. But speed is just one of the transformative promises of 5G. What about support for millions of IoT devices and mission critical applications like selfdriving vehicles? See the future of our connected world through the eyes of those who make it happen.

Date: January 8, 2:15-3:15 p.m Location: LVCC North Hall N258 Aptiv Speaker: Glen De Vos Partnerships Drive Innovation for Autonomous Vehicles

Designing, testing and manufacturing a new vehicle is expensive. CEOs don't get to make many \$3 billion bets. Some companies are seeking to minimize their risks by partnering with others. Hear why leading innovators are joining forces to develop autonomous vehicle solutions.

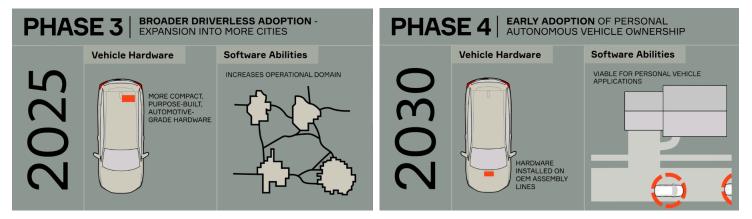
Date: January 9, 10:15 -11:15 a.m. Location: LVCC, Hall/Conf Room Aptiv Speaker: Laura Major End-to-End Automotive IoT Integration – The Competitive Edge

From design to assembly, from dealership to driveway, IoT is integrated into the automotive value chain. As 2020 begins, what do industry leaders expect on the road ahead? How will 5G and AI integrate with IoT in auto and transportation?

Date: January 9, 1-2 p.m Location: LVCC North Hall N253 Aptiv Speaker: Hank Skorny

Automated Mobility Development Phase

PHAS	SE1 IN PARTNERSHIP	RCIAL DEPLOYMENTS WITH RIDE-HAILING NETWORKS	PHASE 2 POINT-TO-F	POINT DRIVERLESS MOBILITY AATIONS
	Vehicle Hardware	Software Abilities	Vehicle Hardware	Software Abilities
2019	VEHICLE EQUIPPED WITH HARDWARE COMPONENTS	SAFETY DRIVER ACTS AS THE BACK-UP OVER DEMONSTRATION ROUTES	CCCC INDUSTRIAL PC HARDWAR	NO DRIVER NEEDED IN LIMITED GEO-FENCED AREAS



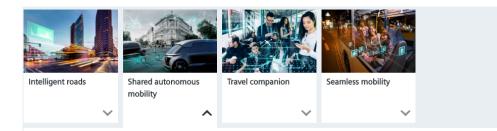
Open Platform Advanced Technology Architecture

The main issue SVA addresses is the increasing amount of software and data required of advance technology vehicles with even limited driver assist features and ranging up to SAE Level 4 and 5 autonomy where the driver has little to no role. Glen De Vos, Aptiv Senior Vice President and Chief Technical Officer predicted SAE Level 2 or Level 2+ systems which assume some driver functions will be the industry "baseline" by 2025 and are fairly affordable for consumers. But the "inflection" point where costs rise dramatically for manufacturers and consumers will be Level 3 vehicles where the car is basically in control.



Those costs then rise even more sharply for Level 4 and 5 vehicles. De Vos contends Aptiv's Smart Vehicle Architecture will go a long way toward controlling those costs, saying, "We're convinced this is where the vehicle has to go—lowering the cost of this technology. You have to take cost out of the existing system to be able to put that in at a price point consumers can actually afford or are willing to pay for."

SIEMENS Connecting People through Seamless Mobility



Mobility systems will be disrupted by autonomous vehicles maintaining and enhancing individual mobility options while expanding public transportation options. We call this an optimized transport system supported by self-driving vehicles. Benefits will include overall optimization of the transportation system, fewer vehicles on the road, improved traffic flow and better mobility access while reducing air pollution and guaranteeing increased safety.

> More information

PAVE360 Platform	MindSphere operating system	Electric vehicle soft- ware solutions	Automotive embedded software
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A common digital thread connecting software and physical systems together is the only way to take control of the increasing complexity of smart and connected products. This will enable a closed-loop behavioral representation of a vehicle's software and hardware systems for continuous validation throughout the product lifecycle.

A robust digital thread will help engineers ensure that software features are fully compatible with the vehicle in which they are deployed and complete with evidence showing that all related tasks and deliverables are available on time. The digital thread will also track accountability for changes regarding not just *who*, but *how* and *why*.

> More information

Siemens References

Presentations

- <u>Siemens Mobility Operating System Empowering Cities</u>
- Connecting Passengers with Seamless Mobility
- eHighway: Sustainable road freight transport
- <u>Shared Autonomous Mobility</u>
- Building An Intermodal Ecosystem

Background Information

- <u>eHighway the backbone for electrified freight transport by road</u>
- Mobility Operating System the mobility center of the future
- <u>Transforming public transit with demand-responsive autonomous shuttle bus systems</u>
- Mobility Made Easy: Digital Solutions for Seamless Transportation





- comfy lounge chair in the rear now with a footrest taking up space where the front passenger would typically sit,
- a screen can fold down from the headliner
- to the left of the passenger is a small desk space with a reading lamp, and it appears the cupholders can be heated or cooled
- BMW wants create a cozy, feel-good atmosphere.
- Built around a futuristic carbon fiber shell, powered by a 42-kilowatt-hour lithium-ion battery pack that channels electricity to a 170-horsepower electric motor mounted over the rear axle. It's reasonably quick off the line, and it can travel for about 150 miles on a single charge

cea – solution for the future of mobility

1. **AI vs Wild** - A CEA technology that protects AI systems and neural networks from security threats and attacks. By using computer vision and speech recognition, they will show you how this technology can guarantee autonomous cars' cyber security and safety.



4. Lifi-Multicell - The world's first smart & interference-free Li-Fi manager, developed by CEA, is a great alternative to Wi-Fi, being the first-ever multi-cell solution with centralized management of conflicts between lighting zones. Tomorrow, it will ensure optimal data transmission speeds and management of user mobility within a network of light fixtures.

 DeepRed - CEA develops software analysers, powered by advanced reasoning, that carry out groundbreaking cybersecurity verifications over both source and binary codes. They help software developers and integrators delive bulletproof systems, and establish trust in the complex ICT supply chains of tomorrow's mobility solutions.



5. Maxens - A CEA technology that maximizes haptic sensations. It is a new generation multifunctional haptic controller that can be used as a driver/operator assistance system in a variety of vehicles (trains, boats, airplanes, helicopters, tractors, etc.) or used in control rooms for monitoring future urban air mobility.





3. **Kiwee** - CEA offers a car sharing system bringing compact electric vehicles to users either at dedicated pickup points or on a free floating basis. Vehicles can be stacked like shopping carts, the entire train being charged from a single charging point. Kiwee is ideal for users in downtown and suburban areas seeking a non-polluting "first mile/last mile" solution to complement their public transportation or carpooling journeys.



6. Lensfree - Protected by 25 patents, the CEA-developed lensless imaging technology enables an extra-wide field of view, robust performance, and a compact footprint for much less money than an optical microscope, bringing healthcare professionals point-of-care tests that previously had to be sent to a lab. Soon, this technology will allow patients to get results and treatments much faster.



BOSCH Artificial Intelligence in Everyday Life

Bosch 3D Display



Passive 3D technology is used to generate images and warning signals on the vehicle display. This allows the driver to take in the information faster than if it were displayed on conventional screens, thus reducing driver distraction. This system with spatial depth works completely without additional features such as eye-tracking or 3D glasses.

(more information) <u>https://www.bosch-presse.de/pressportal/de/en/new-dimension-bosch-is-paving-the-way-for-3d-displays-in-vehicles-196096.html</u>

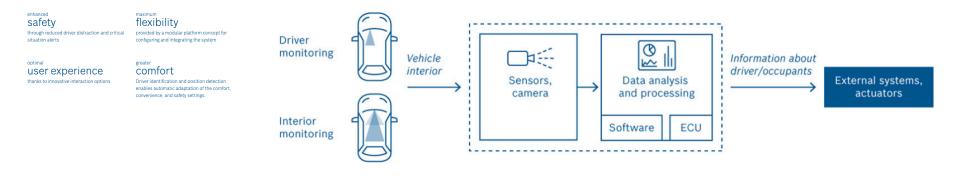
IoT Shuttle



The concept vehicle incorporates a number of technologies and services. It is one example of how electric driverless shuttles could convey passengers in the not too distant future. IoT shuttle also includes a complete ecosystem of networked mobility services, such as reservation and sharing platforms for consumers as well as solutions for car manufacturers and mobility service providers who wish to use autonomous shuttles to offer on-demand mobility. Among other things, Bosch will be demonstrating how online platforms can be used to manage, charge, and maintain fleet vehicles at its booth.

(more information) <u>https://www.bosch-mobility-</u> solutions.com/en/highlights/connected-mobility/connected-vehicle/

Modular Interior Monitoring System



driver monitoring

interior and occupant monitoring

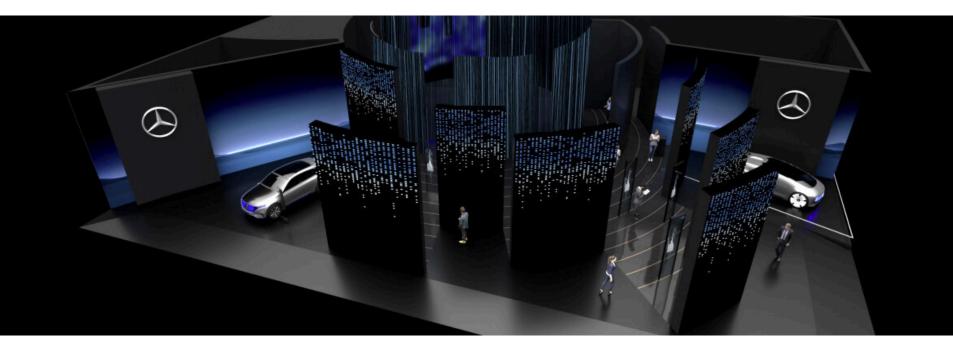
safety and convenience



(more information) <u>https://www.bosch-mobility-solutions.com/en/products-and-services/passenger-cars-and-light-commercial-vehicles/interior-and-body-systems/interior-monitoring-systems/</u>



• a visionary outlook of the future interaction between man and machine.



EQC 400 4Matic



- combined power consumption : 20.8-19.7kWh/100 km, combined CO₂ emissions: 0 g/km
- (참고) <u>(https://www.mercedes-</u> <u>benz.com/en/vehicles/passenger-cars/eqc/the-new-</u> <u>eqc/?owda=misc</u>

EQS – Outlook on the Future of Benz Mobility



- futuristic concept vehicle
- timeless need for mobility and luxury, and uncertainty about what will come next
- design : sustainable, intelligent, luxurious design
- communication vehicle 360 degree exterior lightbelt and digital light headlamps
- (참고) <u>https://www.mercedes-benz.com/en/eq/concept-</u> <u>cars/vision-eqs/</u>



Mobileye – Next Generation ADAS & Robotaxi Revolution

VISIT OUR BOOTH!

Visit the Mobileye booth to experience an eye-opening five-minute show which combines live storytelling and stunning video art to bring Mobileye's strategy to life in a creative and dynamic way. Playing at the top of every hour – don't miss it!

Additionally, tour the booth installations to see – and interact with – Mobileye technology first-hand – both embedded in real hardware, and via interactive displays.



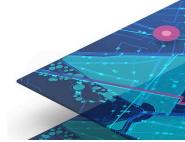
NEXT GENERATION ADAS

Mobileye continues to pioneer cutting edge ADAS technology, leveraging our unique REM™ mapping technology to introduce enhanced features to the market with L2+. Mobileye is the technology supplier for 8 of 11 current L2+ production programs, and by the end of 2020 we will have shipped our fifty millionth EyeQ[®] chip.

DATA SERVICES

In addition to producing the maps for use by future AVs, Mobileye's REM™ mapping technology has also given rise to a promising spin-off data business. Beyond powering safety features, the onboard camera is now being used to capture data about what it sees, from roadside infrastructure assets to numbers of pedestrians at bus stops. This data generates 'actionable insights' which enable evidence-based urban planning improvements far beyond the automotive sphere.



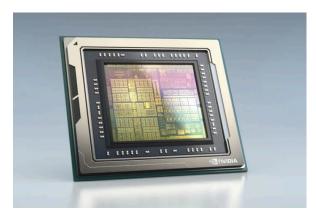




ROBOTAXI REVOLUTION

For Mobileye, robotaxis are both the strategic bridge to future consumer AVs, as well as a massive opportunity on their own; it's predicted that the robotaxi market will be worth \$160B by 2030. Mobileye is moving full-speed ahead towards the launch of a robotaxi service with Volkswagen in Tel Aviv, and then toward additional cities worldwide.





- 170 억 개의 반도체 트랜지스터로 구성된 SoC로 Xavier SoC 성능의 7 배에 수준인 초당 200조 작업 처리 가능
- NVIDIA 차세대 GPU 아키텍처와 Arm Hercules CPU 코어, 새로운 딥 러닝 및 컴퓨터 비전 가속기를 통합
- 이전 세대보다 10% 높은 전력과 효율성을 달성하도록 설계
- 자율주행자동차와 로봇의 응용 프로그램과 신경망에서 작동하도록 설계 - 레벨2에서 완전 자율주행 레벨 5 차 량에 적용 가능

국내기업

Urban Air Mobility Concept



- Urban Air Mobility (UAM) landscape Concept consisted of PAVs, PBVs, and HUB
- UAM Ecosystem and services utilizing PAVs
- PAV Personal Air Vehicle / PBV Purpose Built Vehicle
- Hub Take off/Landing point for PAVs and arrival/departure point for PBVs. Also serves as place for community activities
- press event to be held at 3 p.m. on January 6 at Mandalay Bay South Convention Center 2F Oceanside B.





- 2019년 선보인 M. Vision 보다 진화된 컨셉으로 자율주행 센서, 커뮤니케이션 라이딩, 가상공간 터치, 3D 리어 램프, 프리미엄사운드 크렐(krell) 등을 설치
- 커뮤니케이션 라이팅 차량 몸체 램프를 통해 상황에 따 라 웃거나 '먼저가세요', '조심하세요' 등 그래픽 메시지로 보행자와 소통, 운전모드 승객 감정상태 변화 자동 인식 조명 컬러 변화 등 서비스 제공
- 수소연료전지시스템 체험공간 운영 예정



- 집 안 팎의 경계를 허물고 인공지능으로 제품과 서비스를 연결
 하는 차별화된 고객가치
- 리눅스 기반의 차량용 인포테인먼트 플랫폼 webOSAuto 출품 (글로벌 car seat 업체인 <u>adient</u> 와 공동개발, 퀄컴, MS, 룩소프트등도 webOSAuto 적용 제품 소개 예정)



• LG ThinQ zeon은

- 집 안에서 누리는 인공지능 솔루션을 소개하는 LG LG ThinQ Home
- 이동수단에서의 인공지능 경험을 보여주는 Connected Car Zone
- '사용자와 닮은 3D 아바타에 옷을 입혀보며 실제와 같은 가상 피팅을 경험할 수 있는 'ThinQ Fit Collection
- 로봇을 활용한 다이닝 솔루션을 선보이는 CLOi's Table 등으로 구성
- LG전자 인공지능 플랫폼인 LG ThinQ씽큐홈과 연결해 자동차 안에서 다야한 커넥티드 기능 사용 가능a(집에서 TV를 보다 자동차로 이동하면 이어보기 기능을 제공하며 가전 제품 작동 상태 정보 표시)

기타

- <u>CES 2020 Innovation Awards List</u>
- <u>참가한 vehicle technology 업체 리스트 (612개)</u>

• 기타 모빌리티 관련 업체 출품 및 발표 내용

- Nvidia <u>https://www.nvidia.com/en-us/events/ces/</u>
- Tomtom https://www.tomtom.com/company/events/CES-2019/
- HERE <u>https://www.here.com/events/ces-2020</u>
- ANSYS <u>https://www.ansys.com/blog/emobility-autonomous-vehicles-ces-2020</u>
- Continental <u>https://www.continental.com/en/press/fairs-events/ces-2020/mobility-is-the-heartbeat-of-life-203524</u>
- MAGNA AT CES 2020
- <u>lav</u>-smart guide(next level navigation), smart speech(next level voice control), Smart AI-driven Climate Control Simply Cozy, Smart Cargobike – Last Mile Mobility with Fleet Management



가장 깔끔한 CES 가이드

• <u>CES 2020 Guide: All The Robots You Can Handle (fobes)</u> (이동, 관람, follow해야 할 사람, 주요 컨퍼런스 등)

모빌리티 관련 분야 conference schedule | Exhibitors list

- <u>Vehicle Technology</u>
- <u>Self-Driving Cars</u>
- Drone
- Smart Cities

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