VIDYAVARDHINI'S COLLEGE OF ENGINEERING AND TECHNOLOGY

BYTE

THE NEWSLETTER OF COMPUTER ENGINEERING DEPARTMENT

STAFF INCHARGE: MR. VIKRANT A. AGASKAR
SR. EDITORS: MS. PRIYANKA DHAYADE
MR. KUNAL PADAM

AIBO : Artificial Intelligence Robot

It is a series of robotic pets designed and manufactured by Sony. Sony announced a prototype Aibo in mid-1998.The first consumer model was introduced on May 11, 1999.New models were released every year until 2006. Although most models were dog-like, other inspirations included lion-cubs and space explorer, and only the ERS-7 version and ERS-1000 versions was explicitly a "robotic dog". In November 2017, Sony announced a new generation of AIBO after 11 years.The fourth generation model, ERS-1000, was launched in Japan on 11 January 2018. The second lottery sale was set on 6 February 2018 .

All AIBOs are bundled with AIBOLife software giving the robot a personality, the ability to walk, "see" its environment via camera and recognize spoken commands (English and Spanish, or Japanese). AIBO's sounds were programmed by Japanese DJ/avant-garde composer Nobukazu Takemura, fusing mechanic and organic concepts.

The sounds in ERS-7 Mind and custom data were composed by Masaya Matsuura, a Japanese musician and game designer.Aperios is Sony's Proprietary Real-Time Operating system, used in all AIBOs, QRIO and some other consumer devices. Aperios OS was intended to be widely deployed using revolutionary real-time capabilities to handle multiple audio and visual data streams concurrently.The OPEN-R architecture is specific to entertainment robots.The architecture involves the use of modular hardware components, such as appendages that can be easily removed and replaced to change the shape and function of the robots, and modular software components that can be interchanged to change their behavior and movement patterns. AIBO's creator, Doi, called OPEN-R the masterpiece of the AIBO development project, arguing it would minimize the need for programming individual movements or responses, and its "open" nature would encourage a global community of robot specialists and programmers to add capability.

DEPARTMENT OF COMPUTER ENGINEERING

AIBOware (a trademark of Sony corporation) is the btle given to the software the AIBO runs on its pink Memory Stick. The Life AIBOware allows the robot to be raised from pup to fully grown adult while going through various stages of development as its owner interacts with it. The Explorer AIBOware allows the owner to interact with a fully mature robot able to understand (though not necessarily willing to obey) 100 voice commands. Without AIBOware, AIBOs run in "clinic mode" and can only perform basic actions.

Third generation ERS-7 models have a sole "Mind" software that includes capabilities of AIBOLife and other AIBOware packages. Mind software also includes a docking process, allowing ERS-7's to recharge autonomously. Upgrades in Mind2 included the AIBO Entertainment Player, a Wi-Fi based connection to a PC. Upgrades in Mind3 included speech, blogging and autonomous room mapping.

AIBO's complete vision system uses the SIFT algorithm, to recognise its charging station. The vision system is an implementation of Evolution Robotics ERVision.

Digital Twins :Technology driven by IoT

IoT is an area where the so-called Digital Twins concept evolves at the fastest pace. Modern household appliances use a lot of smart components equipped with sensors to gather data about real-time status, working conditions, problems and so on. They're integrated to cloud-based systems to gather data, then process and analyze it.

And here's how a digital twin is created. It's a kind of pairing appliance which reflects its real-life counterpart in the digital environment. This virtual model of a product or service allows for analysis of huge amount of various data. In effect, we can deal with problems before they even occur, prevent downtime, develop new functionalities and much more.

The digital twin concept has the widest coverage in such projects as smart cities, real time navigable models, or health care – with virtualization of a hospital systems for work safety and continuity.

We can also observe that digital twin technology is spreading to the user experience field. Service providers try to get clients to attend their events, for example trades or fashion shows, and let customers build their visual twin to become a part of an event. This way they create an extraordinary user experience.

A digital twin is an exact digital replica of a product, process or service. This living model creates a thread between the physical and digital world. Internet of things (IoT)-connected objects are replicated digitally, enabling simulations, testing, modeling and monitoring based on the data collected by IoT sensors. Like everything in the realm of IoT, data is the primary driver, and most invaluable output, of digital twins. The sharing and analysis of digital twin data empowers companies to make decisions which directly impact their key performance indicators.

A digital twin, alternately, does not act as a replacement for the physical object or service which it represents. Instead, it is a digital replica of the initial "thing," acting as a vehicle for monitoring and testing around the physical object without actually having to be in close proximity to it.

Sensors attached to the physical object collect massive amounts of data, which allows the digital version to act like the physical object. This shows a business exactly how each individual machine on their production floor is functioning, for example, rather than making assumptions based on a generalized expectation for how the machine should function, when it will need repairs or how it could perform more efficiently.

The idea of digital twins is predated by pairing technology, developed by NASA to help in the operation, repairs and maintenance of spacecraft traveling outside the range of physical monitoring. These "twin" systems are what made it possible for engineers and astronauts to test repairs for the ill-fated Apollo 13 mission, bringing the craft and crew back to earth safely. NASA now uses digital twins, thanks to the development of sensors, to gather data, make recommendations to crew members and plan for the needs of future aircraft. Aside from maintenance, digital twins can also be used to improve and evolve customer experience.

Digital twin technology has implications across a wide variety of industries: From an HVAC technician visualizing and predicting maintenance on the fan motor of an industrial cooling unit, to a manufacturer testing the impact of introducing a new packaging machine into its shipping processes prior to actually implementing the machine in real life, digital twins enable businesses to conduct tests, and make smarter and better-informed decisions in the digital world before implementing them in the physical. The technology has predominantly been adopted in manufacturing.

Blockchain

Blockchain became a hot tech topic in 2017, thanks in no small part to Bitcoin's meteoric rise. But beyond digital currency, blockchain is a technology poised to revolutionize nearly every industry. In 2018, we'll start to see the first attempts at this disruption through business-class blockchain platforms.

Many of the legacy technology companies introduced their own blockchain platforms in 2017. IBM is considered the leader, and they are already penning partnerships with banks, food distributors, and government regulation agencies to put blockchain to use. However, Microsoft, Oracle, and Amazon are close behind, and the battle for enterprise-level blockchain dominance is just heating up.

What does this all mean for the software industry? Businesses in every industry are going to start building apps on blockchain platforms, which means the demand for blockchain developers is going to explode. According to 2016 figures, there were only 5,000 full-time blockchain developers in the world. Surely that number increased in 2017, but it still pales in comparison to the over 18 million Java developers. 2018 will be a gold rush for developers who dedicate themselves to blockchain, and most will come away a whole lot richer.

Blockchain technology can be integrated into multiple areas. The primary use of blockchains today is as a distributed ledger for cryptocurrencies, most notably bitcoin. There are a few operational products maturing from proof of concept by late 2016.As of 2016, some observers remain skeptical. Steve Wilson, of Constellation Research, believes the technology has been hyped with unrealistic claims.To mitigate risk, businesses are reluctant to place blockchain at the core of the business structure.Also, most cryptocurrencies use blockchain technology to record transactions. For example, the bitcoin network and Ethereum network are blockchain-based.Blockchain-based smart contracts are proposed contracts that could be partially or fully executed or enforced without human interaction.Blockchain technology can be used to create a permanent, public, transparent ledger system for compiling data on sales, tracking digital use and payments to content creators, such as wireless users or musicians.

Mixed Reality

Mixed reality has been as prominent in modern popular culture as VR. Sci-fi is rife with holograms, often manipulatable, and it has long been the vision for computers to take on a less confined display - think Minority Report. Mixed reality essentially holds all of the utility of augmented reality (the kind of heads up display supposed to have transformed our lives by now) on top of the imagination of VR. Characters in the video games created will interact with the actual world in front of the wearer, rather than an entirely constructed landscape. Microsoft technical fellow Alex Kipman confusingly referred to it as 'augmented virtuality', and the marrying of the two is what gives mixed reality a real chance of becoming ubiquitous.

Microsoft expects 80 million mixed reality devices to be sold by 2020, a figure it revealed to the surprise of pundits at Computex. For perspective, IDC estimate that 64.8 million VR headsets will be sold by the same year, and Microsoft's confidence in the technology gives it an incredibly influential proponent. Google's Glass was ugly. Its shape ignored the necessity for a soft introduction of wearable tech - early users would generally rather the tech blend in, rather than have them look like an extra from a sci-fi movie.

It's on this matter of form that some companies developing the tech seem to be hesitating - the function is already there. Microsoft's HoloLens isn't an aesthetic nightmare by any means, but is probably too goofy to see quick, widespread adoption; it looks a lot more like a VR headset than an a pair of Ray-Ban sunglasses, for example. Style is important for wearables intended for public use, and is currently where Magic Leap - one of the US' most exciting startups - is keeping its cards very close to its chest. Located in suburban Florida, the company may have just found the future of altered reality, and its mixed. A very detailed Wired piece exploring the company highlights the fact that investors have shovelled some $1.4 billion into the startup, including the likes of Qualcomm and Google. Alibaba led the most recent round of funding, pulling in $793.5 million in what Wired estimates could be the 'largest 'C' round in Internet history.'

The buzz around Magic Leap is incredible. Proof of concept videos have shown what the technology is capable of, and its overlaying of anything from messages and presentations to video games onto reality looks spectacular. The company is yet to release any physical product, though. Seemingly committed to waiting until the technology is properly developed, Rony Abovitz and his team are yet to even offer a beta to developers, meaning backers will wait with bated breath to see how the technology actually looks come release. The online community has been sceptical of Magic Leap, and will continue to be as long as there is no hardware available - let's just hope that its eventual arrival increases the buzz rather than stops it in its tracks. Mixed reality is the future of digital eyewear, and Magic Leap might just have the backing to bring it to the market.

Edge Computing

If you get a lot of data as is the case when you leverage IoT in such end-to-end ways or even in specific highly sensor-intensive and thus data-intensive environments whereby data is generated at the edge which by definition happens in IoT as your data sensing and gathering devices ARE at the edge (think about all the sensors and data they generate in a large oil and gas project where you can have hundreds of thousands of sensor data points across myriad wells but also about all the IoT data in a smart city or large critical power buildingsuch as an airport), you inevitable encounter challenges on levels such as bandwidth, network latency, speed overall and so forth where fog and edge computing play a role. In IoT applications with a mission-critical and/or remote component the need for speed and for different approaches such as edge computing is even more important.

Edge computing is focused on devices and technologies that are attached to the things in the Internet of Things such as industrial machines (GE)

Depending on the context and scope of the project you want the data you need fast. Or better: you need the aggregated and analyzed data, in the shape of actionable intelligence, enabling you to take actions and decisions, fast, whether these decisions are human or not. So, you don't need all that data to store it and analyze it in the cloud but you only want that bit of data traveling across your networks.

You can imagine hundreds of scenarios where speed and fast data is key, from asset management, critical power issues, process optimization, predictive analytics to the real-time needs of supply chain management in a hyper-connected world, the list is endless.

You can also imagine that the more your building, business ecosystem and whatnot thrives on fast data and real-time holistic management in any broader context, the more valuable that data can become when properly leveraged and rapidly analyzed. We do live in times where having the right insights fast enough can have enormous consequences.

Speed of data and analysis is essential in many industrial IoT applications but is also a key element of industrial transformation and all the other areas where we move towards autonomous and semi-autonomous decisions made by systems, actuators and various controls.

That degree of autonomy is even at the very core of many of the desired outcomes and of the goals in, for instance, Industry 4.0 as we move towards the next stage of the third platform which is all about autonomy.
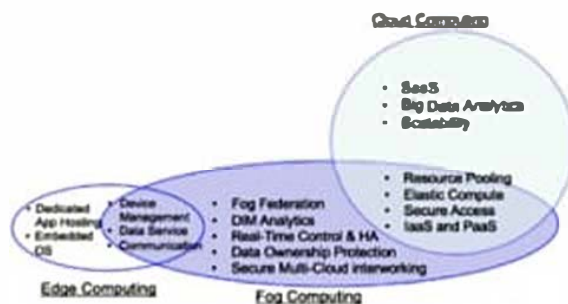
Stretchy Artificial 'Skin' Could Give Robots a Sense of Touch

Rubber electronics and sensors that operate normally even when stretched to up to 50 percent of their length could work as artificial skin on robots, according to a new study. They could also give flexible sensing capabilities to a range of electronic devices, the researchers said.

Like human skin, the material is able to sense strain, pressure and temperature, according to the researchers.

"It's a piece of rubber, but it has the function of a circuit and sensors," said Cunjiang Yu, an assistant professor of mechanical engineering at the University of Houston.

Electronics and robots are typically limited by the stiff and rigid semiconductor materials that make up their computer circuits. As such, most electronic devices lack the ability to stretch, the authors said in the study.In research labs around the world, scientists are working on various solutions to produce flexible electronics. Some innovations include tiny, embedded, rigid transistors that are "islands"in a flexible matrix. Others involve using stretchy, polymer semiconductors. The main challenges with many of these ideas are that they're too difficult or expensive to allow for mass production, or the transmission of electrons through the material is not very efficient. This latest solution addresses both of those issues, the researchers said. Instead of inventing sophisticated polymers from scratch, the scientists turned to low-cost, commercially available alternatives to create a stretchy material that works as a stable semiconductor and can be scaled up for manufacturing, the researchers wrote in the study.

PlayerUnknown's Battlegrounds (PUBG)

PUBG is an online multiplayer battle royale game developed and published by PUBG Corporation, a subsidiary of South Korean video game company Bluehole.The game is based on previous mods that were created by Brendan "PlayerUnknown" Greene for other games using the film Battle Royale for inspiration, and expanded into a standalone game under Greene's

creative direction. In the game, up to one hundred players parachute onto an island and scavenge for weapons and equipment to kill others while avoiding getting killed themselves. The available safe area of the game's map decreases in size over time, directing surviving players into tighter areas to force encounters. The last player or team standing wins the round.

The game was released for Microsoft Windows via Steam's early access beta program in March 2017, with a full release on December 20, 2017. That same month, the game was released by Microsoft Studios for the Xbox One via its Xbox Game Preview program, and officially released in September 2018. In early 2018, it was localized and released by Tencent Games in China, while two mobile versions based on the game for Android and iOS were also released. The game is one of the best-selling of all time, with over fifty million sold across all platforms by June 2018. In addition, the Windows version holds a peak concurrent player count of over three million on Steam, which is an all-time high on the platform.Battlegrounds received positive reception from critics during both its early access period and on official release, who found that while the game still was not fully finished and had some technical flaws, Battlegrounds presented new types of gameplay that could be easily approached by players of any skill level and was highly replayable. PUBG Corporation has run several small tournaments and introduced in-game tools to help with broadcasting the game to spectators, as they wish for it to become a popular eSport.

Some Interesting facts:

· The first computer mouse was made with wood in 1964 by Doug Engelhart.

· 30,000 websites are hacked every day.

· The Dirty Dozen was the name of a 12 engineer's group who developed the first IBM computer.

· In 1939, the first electro mechanical computer was made/developed.

· ENIAC was the first electronic computer which was weighed around 27 tons and it's taken up space around 1800sf (square feet).

· In 1979, the first of first hard disk/drive was made to store the user's data and it could hold only data under 5MB.

· Microsoft Windows, this is not an original name, the first original name was 'Interface manager' which was changed later.

Articles contributed by: Juiely Naik
Arham Kazi
Anang Verna
Kavya Nair