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LASER VIDEO DISPLAY

Laser color video display utilizes two or more individually modulated optical (laser) rays of different colors to produce a combined spot that is scanned and projected across the image plane by a polygon-mirror system or less effectively by optoelectronic means to produce a color-television display. The special case of one ray reduces the system to a monochromatic display as, for example, in black-and-white television. This principle applies to a display as well as to a (front or rear) projection technique with lasers (a laser video projector).

Lasers may become an ideal replacement for the UHP lamps which are currently in use in projection display devices such as rear projection TV and front projectors. LG claims a lifetime of 25,000 hours for their laser projector, compared to 10,000 hours for a UHP. Current televisions are capable of displaying only 40% of the colour gamut that humans can potentially perceive. A Laser TV requires lasers in three distinct wavelengths: red, green, and blue. While red laser diodes are commercially available, there are no commercially available

green laser diodes which can provide the required power at room temperature with an adequate lifetime. Instead frequency doubling can be used to provide the green wavelengths. Several types of lasers can be used as the frequency doubled sources: fibre lasers, inter cavity doubled lasers, external cavity doubled lasers, VCSELs, and OPSLs (Optically Pumped Semiconductor Lasers). Among the inter cavity doubled lasers VCSELs have shown much promise and potential to be the basis for a mass-produced frequency doubled laser.

A VECSEL is a vertical cavity, and is composed of two mirrors. On top of one of them is a diode as the active medium. These lasers combine high overall efficiency with good beam quality. The light from the high power IR-laser diodes is converted into visible light by means of extra-cavity waveguide second harmonic generation. Laser-pulses with about 10 kHz repetition rate and various lengths are sent to a Digital Micro mirror Device where each mirror directs the pulse either onto screen or into the dump. Because the wavelengths are known all coatings can be optimized to reduce reflections and therefore speckle.

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PHONE INDUCTION STATION

Are you Sick of fiddling about with wires and micro USB connectors when recharging? Then slot your mobile into a wireless charging shell and you'll never have to bother with them again. Simply place your phone on the compatible wireless charger provided by the same company and it will charge your phone automatically. Just like magic.

Inductive charging (also known as "wireless charging") uses an electromagnetic field to transfer energy between two objects. This is usually done with a charging station. Energy is sent through an inductive coupling to an electrical device, which can then use that energy to charge batteries or run the device.

The main disadvantages of inductive charging are its lower efficiency and increased resistive heating in comparison to direct contact. Implementations using lower frequencies or older drive technologies charge more slowly and generate heat within most portable electronics. Slower charging - due to the lower efficiency, devices can take longer to charge when supplied power is equal.

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INDIA-2020

India is a developing country and the pace at which it is making progress is very fast indeed. If this rapid progress is maintained, the state of affairs in 2020 A.D. would be very impressive. In 2020 A.D. India will present a picture of tremendous progress and prosperity. It is a fact that without our five year plans we could not turn out poverty, hunger, diseases and illiteracy from her door.

Our country is rightly called an agricultural country. At present the condition of agriculture is not much satisfactory. Production is low as compared with other progressive countries of Europe and America. Farmers are taught and advised to use improved methods of agriculture and scientific implements. So it is hoped that within thirty years general output will be at least doubled. Then we shall meet our domestic needs and expert food grains to some extent.

There is a great change in the agriculture formerly, it was not a profession. It was a lay man's work. Now it has become a profession. So the farmers send their children to acquire technical training. They attend the seminars and agricultural exhibitions. In the field of heavy Industries, progress is being made. By that time, Indians would also achieve new meaning and grace. The luxuries that on the privilege of a few now-a-days would come within the reach of the masses. Standard of living would rise and the present stage of hunger and poverty will become a thing of past. India of 2020 AD-The future of India is very bright. Although the trend of coalition government appears a political period of instability. But the economic development of the country can be pursued. There can many countries like Japan and China where coalition governments have become the order of the day. The entry of multi nations should be allowed only in the core sector to save our industrial backbone. But at the same time we should not be afraid of healthy global competition because these days, no nation can afford to be isolated from integrating with the rest of the world.

I think India of 2020 AD would be much more prosperous and vibrant. But the problem of unemployment, poverty, disease is not going to vanish. Only we must strengthen our resolve to bright them out and make India a front-ranking nation of India.

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Li- Fi Technology

Transmission of data through light

Transfer of data from one place to another is one of the most important day-to-day activities. The current wireless networks that connect us to the internet are very slow when multiple devices are connected. As the number of devices that access the internet increases, the fixed bandwidth available makes it more and more difficult to enjoy high data transfer rates and connect to a secure network. But, radio waves are just a small part of the spectrum available for data transfer. A solution to this problem is by the use of Li-Fi. Li-Fi stands for Light-Fidelity. Li-Fi is transmission of data through illumination by taking the fiber out of fiber optics by sending data through an LED light bulb. It is the term some have used to label the fast and cheap wireless communication system, which is the optical version of Wi-Fi. Li-Fi uses visible light instead of Gigahertz radio waves for data transfer. It is based on LEDs or other light source for the transfer of data. The transfer of the data can be with the help of all kinds of light, no matter the part of the spectrum that they belong. That is, the light can belong to the invisible, ultraviolet or the visible part of the spectrum. Also, the speed of the communication is more than sufficient for downloading movies, games, music and all in very less time.

Li-Fi can be the technology for the future where data for laptops, smart phones, and tablets will be transmitted through the light in a room. Security would not be an issue because if you can_t see the light, you can't access the data. As a result, it can be used in high security military areas. It is the upcoming and on growing technology acting as competent for various other developing and already invented technologies. Hence the future applications of the Li-Fi can be predicted and extended to different platforms and various walks of human life. Possibilities for future utilization are abundant. Every light bulb can be converted into li-fi signal receptor to transfer data and we could proceed toward the cleaner, safer, greener and brighter future. As we know that the airways are getting clogged day by day Li-fi can offer a genuine and very efficient alternative. Li-Fi is enabled by advanced digital transmission technologies. Optical cell networks based on Li-Fi are the link between future energy efficient illumination and cellular communications. They can also harness unregulated, unused and vast amount of electromagnetic spectrum and can even enable ever smaller cells without the need for new infrastructure. The issues of shortage of radio frequency can be tackled easily with only limitation being that it works in direct line of sight of light. There are no dead ends to technology and science. Now both light and radio waves can be used simultaneously to transfer data and signals

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5G Wireless Communication

The ―G‖ in 5G stands for ―generation.‖ Wireless phone technology technically started with 1G, and in the early 1990s, and it expanded to 2G when companies first started enabling people to send text messages between two cellular devices. Eventually the world moved on to 3G, which gave people the ability to make phone calls, send text messages, and browse the internet. 4G enhanced many of the capabilities that were made possible with the third generation of wireless. People could browse the web, send text messages, and make phone calls—and they could even download and upload large video files without any issues. Then companies added LTE, short for ―long term evolution,‖ to 4G connectivity. LTE became the fastest and most consistent variety of 4Gcompared to competing technologies like Wi-Max. The difference between Wi-Max and LTE is similar to the difference between Blu-Ray and HD DVDs: Both technologies achieved similar outcomes, but it was important to create a standard for everyone to use. LTE did just that, and it made 4G technology even faster. 5G will build on the foundation created by 4G LTE. It‘s going to allow people send texts, make calls, and browse the web as always—and it will dramatically increase the speed at which data is transferred across the network. 5G will make it easier for people to download and upload Ultra HD and 3D video. It will also make room for the thousands of internet-connected devices entering our everyday world. Just imagine upgrading your data connection from a garden hose to a fire hose. The difference will be noticeable. There are already huge consortiums of major global telecoms working to create worldwide standards around 5G. Although most of those standards haven‘t been solidified, experts expect it to be backwards compatible (with 4G and 3G) in addition to having some interoperability across the world.

In their most basic form, cell phones are basically two-way radios. When you call someone, your phone converts your voice into an electrical signal. It transmits that electrical signal to the nearest cell tower using radio wave. The cell tower bounces the radio wave through a network of cell towers and eventually to your friend‘s phone. The same thing is happening when you send other forms of data (like photos and video) across the network.

Typically when a new mobile wireless technology comes along (like 5G), it‘s assigned a higher radio frequency. For instance, 4G occupied the frequency bands up to 20 MHz . In the case of 5G, it will likely sit on the frequency band up to 6GHz. The reason new wireless technologies occupy higher frequencies is because they typically aren‘t in use and move information at a much faster speed. The problem is that higher frequency signals don‘t travel as far as lower frequencies, so multiple input and output antennas (MIMOs) will probably be used to boost signals anywhere 5G is offered.

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electrobuzz.etrx@universal.edu.in
Department of Electronics Engineering

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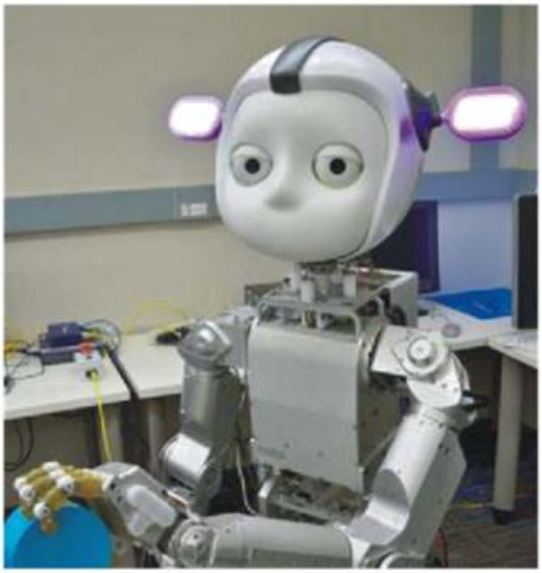

HUMANOID ROBOTS

A Humanoid may be defined as something that resembles or looks like a human and having characteristics like opposable thumb, ability to walk in upright position, etc. These robots are called Humanoid Robots or may be simply **"Humanoids".**

In general Humanoid robots have a torso with a head, two arms and two legs, although some forms of humanoid robots may model only part of the body, for example, from the waist up. Some humanoid robots may also have a 'face', with 'eyes' and 'mouth'.

Features of Humanoid Robots

The characteristics features of Humanoid Robots include:

. Self-maintenance
. Autonomous learning
. Avoiding harmful situations to people, property, and itself
. Safe interacting with human beings and the environment

Working and Control Mechanism

Concept of Zero Moment Point:

This concept explains the dynamic balance of humanoids during walking which requires information about the contact forces and the current and desired direction of motion.

As per the ZMP Theory, the pressure under supporting foot can be replaced by the appropriate reaction force acting at a certain point of the mechanism's foot. Since the sum of all moments of active forces with respect to this point is equal to zero, it is termed as the Zero Moment Point (ZMP).

Conclusion

Though the technology has advanced much in the field of Humanoid Robotics, there are still several problems which need attention. The technological brilliance of the humanoids is required to be sharpened more and the shortcomings in the results must be dealt with properly.

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Forget About OEE …

What's Your Smart Manufacturing Score?

By Gordon Benzie, Schneider Electric

Much has been discussed about Smart Manufacturing, or the use of the Industrial Internet of Things in manufacturing environments. But it seems everyone has a different opinion of what that actually means. In this article, I will attempt to define what a Smart Factory is, with suggestions on how to move further along your journey to achieve "smarter" manufacturing across your organization. As we all like to simplify how we measure efficiency or productivity across the factory, how about we start tracking how smart our manufacturing is with a score? This could then help to measure improvement within a site, or across locations. For the purposes of this article, let's call it a Smart Manufacturing Score.

As I see it, there are five components to a Smart Factory, rolling up to a smart manufacturing enterprise. All five must be met to some degree before an operation can be considered truly smart. If you want to rate how smart your factory or manufacturing organization is, give yourself a score of 0 to 5 for each of these categories.

Smart Equipment Here :

Smart can be defined as the ability to monitor conditions and operations, and respond to an out-of-compliance incident by taking an appropriate action. This means smart equipment can do some sort of self-triggered response to an operational event. An example might be if a transportation container issued an alert if too high (or too low) a temperature is recorded along a cold chain, to then apply an appropriate adjustment to save the cargo. Further actions could include requesting a diagnostic evaluation as a follow up if the out-of-compliance event recurs; personnel could be alerted too if certain specs begin trending towards these limits.

Thinking more broadly, smart equipment is also a prerequisite for collecting and reporting detailed data about every production step, from primary, fermentation or purification stages through secondary manufacturing processes through packaging and labelling stages. This data can then be used to perform root cause analysis, to address regulatory inquiries, or to meet other genealogy requirements, taking advantage of big data analytics for process improvement.

Scoring: 0 points if you still use basic NC machines 5 points if all equipment has builtin intelligence, sensors, real-time communications, integration with other systems (enterprise MES, CoE, ERP)

Smart Processes This would be at the information or communication level the ISA 88 or ISA 95 model, whereby processes that manage manufacturing operations have the capability to perform actions that are triggered by others. Smart processes generally require smart equipment to provide the data for decision-making. Most manufacturers have likely already achieved some level of smart processes, such as Lean triggers to automatically replenish supplies that are running low, or to synchronize with other smart equipment in the production flow upstream and downstream.

In the discrete manufacturing world, Smart Pull is an example of where this type of intelligence could be leveraged. In a Pull production model, the demand of the production line triggers upstream activities such as ordering parts and supplies and warehouse pulls. Smart Pull builds this capability into the processes, so Lean happens automatically without human intervention.

Life sciences manufacturers can implement similar such models, with an objective to streamline production processes. One thing for certain, a paper based process has no way of operating autonomously without direct interaction by a human operator.

Scoring:

0 points if your processes are still on paper 5 points if you have smart processes integrated across your full production chain Add 1 bonus point if you have closed-loop digital integration between how production processes are executed and how they are designed, as a way to institutionalize a best-in-class innovation and process improvement closed-loop cycle.

Smart Operators Of course, humans are still a very important part of the production equation. The issue here isn't how high their IQ is or what education they have, but rather how empowered are your employees to perform a corrective or preventive action, or address an issue they see, in real-time? What systems or procedures are in place to leverage the intelligent operators working on the "front line" such that significant quality, recipe management or performance issues can be immediately addressed? Can they take action through the system? How easily can they do it? And, what governance process is in place to ensure regulatory guidelines are adhered to – such that they can withstand an FDA audit – such that suggestions don't get lost in a corporate approval process "dead end"? Think of smart operators as informed operators. In a smart factory, that means making all the production information captured by smart equipment and processes readily available to every operator, when they need it and in the right context. For example, a blinking red light that indicates a production line has halted is not very smart.

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An industry leading graphical HMI, however, such as what is offered by Wonderware, can clearly show the cause and accompanying contextual intelligence surrounding the disruption. This information, which collectively can be used to not only highlight the problem, can provide next best steps to quickly remedy – a much smarter approach, and a process that can help operators work smarter in how they perform their job.

Now what if you could take this one step further and predict an impending problem before it occurs? Advanced pattern recognition and machine learning tools provide operators with early warning notifications, days, weeks or months before a problem occurs enabling better maintenance planning, increased equipment utilization and availability.

What is Your Smart Manufacturing Score? Counting the 3 bonus points available, the highest possible score is 28, which would truly be rock-star performance. I doubt if anyone can claim that level of automation. However, if you can claim a score of at least 10, that that is a pretty good starting point. Many solutions exist, such as those provided by Schneider Electric, that can provide you with a framework on how to move forward with your smart manufacturing or Industrial IoT strategy. This effort could then yield important productivity, compliance and other smart improvements, helping you to yield a higher Smart Manufacturing Score up in the teens.

Gordon Benzie is a marketing communications professional responsible for raising the awareness of Schneider Electric's industrial software solutions across media, analyst and social communities that serve 12 industries. Gordon can be found on Google+.

Compiled and Designed by:

MR. SUSHIL DUBEY
MS. JINAL APTE
MS. AARTI SOLANKI
MR. DIPANKAR NANDI
MR. DILEEP PUROHIT
MR. KARAN MEHTA
MR. SAHIL NIKAM

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electrobuzz.etrx@universal.edu.in
Department of Electronics Engineering