2.4 Integrated Systems:

T164 - Social and economic effects of replacing people with robots in the workplace by Aditiya

Social and economic impact of replacing humans with robots in the workplace

Issues:

1. Leaving humans out of a job and hence leaving them out of the capacity to earn and live a life of at least a moderate level luxury which is a right as indicated by the UN Human Rights Commission

2. Trustworthiness of a robot

3. Efficiency and ability of a robot to do the same work, especially the creative aspect

4. Impossibility of completely displacing humans from the workplace

5. Negative effect on humans(like laziness) apart from just throwing them out of a job

6. Lack of the ability of a robot to think rationally and logically. This is not the same thing as algorithmically because computer programs are essentially algorithms.

Emergence of technology:

The first robot ever is by many considered to be the tele-operated boat invented by Nikola Tesla in 1898. The first humanoid robot named Elektro was built in the 1930s. The first autonomous robots were created by a scientist at Bristol University in 1948. Today, robots have evolved into robots like the ASIMO which is made by Honda. The ASIMO's features are as listed below:

1. Recognition of moving objects

2. Recognition of postures and gestures

3. Environment recognition

4. Distinguishing sounds

5. Facial sounds

A robot that is in an MIT lab can distinguish tones from one another, recognize emotion and respond with a reply appropriate.

Stakeholders and their pros and cons:

People- The advent of robots and the replacement of humans in the workplace see humans at both an advantage and a disadvantage. This means the burden is shifted of humans and onto insensitive, untiring objects. Also, with this comes the unfortunate consequence that humans become lazy beings with nothing to do and also they won't be able to earn money to feed their families and live a fairly luxurious life. Also, they need robots to be creative for businesses to run. Also, they are at risk. A young factory worker was killed in Japan in 1981. The cause was likely the lack of the ability of a robot to think rationally. Also a probability was that the robot malfunctioned, wasn't able to sense the man's presence, and it's hydraulic arm, working unrelentingly, pushed the worker into a grinding machine. Also, it leaves many people out of jobs and it is practically impossible for a robot, due to the fact that it's impossible for it to think rationally and creatively, to function as the upper echelons of administration.

Robot companies- Companies which manufacture robots stand to make money if the use of more and more robots is advocated in workplaces. But, on the flipside, in the present times and in the near future, it'll probably be difficult to manufacture single units of robot, let alone mass produce them. Thus, companies can also incur monumental costs by way of manufacturing robots.

Solutions:

The easiest solution is to employ a balanced workforce(balanced in that creative jobs are executed by humans and screwing of things, etc. is done by robots) of robots and humans and ensuring a job for displaced humans.

Areas of Impact:

It impacts economics and business and also simply the ethics of displacing humans from their work and substitute them with insensitive objects. I have explained how earlier in this essay.

This situation is more of an issue in developed countries with a high income per capita in which it'll be hard and all the more immoral do displace an individual from his lucrative job. Despite this being said,

even heavily populated countries can suffer with tones and tones of people. Despite many people being unqualified, they can still be trained to do the mechanized jobs which are most likely the jobs which a robot will do. Thus, introduction of robots into the workforce can face lots of criticism and protest.

or

Social and economic effects of replacing people with robots in the workplace by Akira Jackson

First of all is it possible for robots to replace humans in the workplace? I say it is quite possible because there are already some jobs that got occupied by robots. For example at factories they use robots instead of people to assemble the products. It is certainly efficient to have machines doing the work but t would be bad socially because people would lose jobs.

One issue associated with this subject is unemployment. This is because the robots will take over the jobs that people can perform. To the employers the machines will be much more efficient than hiring people because they don't need to pay the machines every month. Also another issue is trust because the employees would not be able to trust the employer. This is mainly because at any given time they can be replaced by machines and get fired.

Some solutions that can overcome this problem are to keep the machines job to simple tasks that are tedious and no one wants. In this case people would not be threatened to lose their jobs and they would not have to do jobs that they hate. Another way is to create new jobs so the people can get jobs even if they get fired because of machines. For example they can take jobs to make parts for the machines or jobs to assemble the parts of the machines or they can just take jobs that machines can't perform, such as creative jobs like design.

Replacing humans with machines are unethical. This is mainly because taking away jobs from decent people to simply increase efficiency is wrong. Another ethical issue is the humiliation that the people get when they are fired knowing that machines replaced them. This can be really degrading because it is like someone telling you that machines are better than you at the job.

In this subject I think the market system itself is responsible. This is mainly because the world seems to value efficiency more than giving people jobs. That is why they replace people with machines to increase efficiency and to get more profit. Also another fact that is responsible is the people, who invented robots to do peoples jobs, although they did it for the benefit of others they are still the bases of the problem.

A possible alternative decision is to limit the number of robots that can be installed in a facility. This would reserve some jobs for the people and they would not have to be completely replaced. Also they can create new jobs so even if they get replaced they can get new jobs instead.

By limiting the number of robots that can be installed in a facility the economy would be less efficient and they would not be able to produce as much goods as before. So they might be economically worse off compared to other countries. Creating new jobs would possibly decrease the wage that is paid because the money would be distributed more widely.

If we replace people with robots it would be certainly be more efficient but for the people it is bad news because they would lose jobs. But by developing more creative jobs that robots cant perform we can insure that people get paid Also robots can have flaws so it is not smart to totally trust robots thinking they can perform anything. Replacing people with robots certainly has both positive and negative aspects that we need to consider.

T165 - Ethical decisions regarding the use of robots in situations that might endanger human beings by Dwarkesh

Computers are the part of our culture. We have expectations that those computers think like machines. In addition, we are inclined to attribute intelligence to them. All these things were conceived in recent time. But what is decisive is the machine-machine interface. The Turing test concerns the man-machine interface, takes only 20 seconds, but that is not sufficient time for a genuine evaluation of machine. Machines with an experimenter can be trained.

A programmer can never anticipate what an interrogator may say or ask. The power of a computer can be only understood in the context of the social groups to which it is assigned, and human beings then compensate for the defects from artifacts. What can cause or teach and carry out an expert system for a social group? Nothing can be completely described; otherwise, machines could take over

the competence-oriented jobs of workers? Well, this can apply, but this applies alone to behavior-specific competence. The only error is to believe that a tool is an actuator - i.e., an action.

There is a substantial difference between the way in which humans act and the way in which

machines copy a document. Intelligent machines are, however, the most useful and interesting tools. It is to be considered that robots can have the shape of humans and thus be able to simulate humans; this is hardly the case now, but it will be the case in the near future that their abilities will be similar to humans. They need the correct environmental model, thus they are not environmentally open (friendly) like humans; and they need a constant control and maintenance and they need stable environment conditions, in order to do the correct behavior for the day.

Probably, the instinct-secured behavior of some animals is more autonomous and more similar to humans than talented robots in the foreseeable future. So far automats with only very limited functionality can be realized, because they lie within a range of pre-rational intelligence, within which certain human competence is to be simulated. The robots of future will be copied still more from their models, humans or animals. And in robots the artificial and biological elements will unite, since computers, especially networked computers, are disembodied Artificial Intelligence.

The realization of this intelligence in a body-free Cyber world (a sort of disembodied world) is a possibility on one side, and the realization in robots is on the other. But we will still have to wait and see which way will be best for AI development.

For artificial intelligence to become true intelligence, it must become artificial soul and not

be limited to a pure mind or pure cognition. In addition, it's necessary to understand that

feeling and motivation actually contribute to the increase of intelligence to a considerable

degree and that they are possible in the computer.

The free Will is the released Will, or the released motive. Man will build artificial souls, because we are making an attempt to copy the psychological processes to give us much greater understanding. Human beings should know substantially better, and that is so far the case whether, however, a human soul could be designed independently of a human body in a form other than an extremely rough model of a soul, I think is very doubtful. Besides, it would have to be clarified as to which psychological characteristics are to be given to such a soul.

The desire to imitate humans can represent a specific perspective for robotics. It is objected that the communicative competence of humans is not in principle technically replaceable. Technology proceeds right from the outset, where it substitutes for human activities, procedurally differently than nature.

Cognitive robotics is for engineers, at the beginning of technical conversion of a new body-soul theory -- functionalism. But it ignores the role of humans, who can not be simulated. In order to be able to take responsibility, technical systems must be controllable by humans. By a complementary system, organization work quality -- in the double sense of competence promoting tasks and effective achievement -- contribution becomes possible. Occasionally, one must consult the collectiveness of beneficiaries, in order to compensate the damage to those the technology hurt by malfunctioning. This refers both to producer and consumer.

Computers are today, in symbolic algebra, better than humans. Computers with the correct software actually think about facts, make decisions and have goals. The task is to build robots that act as if they seem to have fear, or simulate the fear. We draw a limited comparison with our feelings: in the animal realm we are still safe in our place, and so we confess some feelings to animals. It is similar for machines, and the machine operates in the same way as humans. Artificial Life (AL) and the artificial evolution create whole new thought categories.

Models of neural networks still need to be developed, and the question of consciousness is a very difficult question indeed. The idea of robot as our slaves is a beginning of morally justified slavery. And so, if robots are to have the status of humans, then this form of slavery must also be eliminated. In 20 years our personal computers will be 1000 times more efficient than today and will then exceed our intellectual capacity. Perhaps we can build a computer that is more intelligent than we are, and perhaps not.

T166 - Social impact of human interaction with robots, for example, artificial pets, robots for the disabled and elderly by Nitish

2.4 Integrated Systems:

"The simplistic assumption that replacing humans by intelligent artifacts will necessarily benefit society at large must be continually reevaluated. Clearly, contributing factors will involve concerns of efficiency, the role of work as a component in human self-worth, the distribution of wealth generated by advanced technologies, the potential for growing divisions in society resulting from gross inequities in income and from the loss of work as a central fact of life, and of course the unpredictability of regular and widespread interactions between humans and artificially intelligent programs and devices."

Much ethics is involved with the social impact of human interaction with robots (artificial pets for the disabled and society) and many others.

Efficiency will be a big factor as the robots will be much more efficient than humans. Fewer mistakes will happen and there will be more work done in less time. Concerning pets for the disabled, the pets could be fitted with high-tech equipment such as cameras and sensors. This would help them better than normal pets would.

Another advantage would be that less manpower would be needed to do work. Computers will be handled themselves, and for example managers in offices would not be needed. Since human interaction with robots concerns all aspects of life, it concerns business too.

Disadvantages of robotics in daily life are also present. Due to machines replacing manpower in many fields, people will be deprived of jobs. This will result in disasters to the economy. This is also a big social impact.

Also, the value for man power will decrease. Companies will choose machines over men. It will be extreme if machines start taking over the jobs that men do, except thinking and imagining. The role of work as a component in human-self worth is also a factor.

Distribution of wealth is an interesting one. Since companies or people themselves will buy the machines and wealth will be distributed accordingly. Of course, a higher profit will be gained by the companies selling the products.

"Perhaps because of the gradual increase in the non-standard applications of computers, AI has appeared as somewhat esoteric and not of immediate concern except perhaps for security, military and financial applications. However, other applications such as speech recognition, increasingly sophisticated robots with planning and vision abilities are making their presence felt but with little public impact, so far. The fact that there is so little public debate, if any, about such innovations lends weight to the critical position that AI is a prime example of the technological imperative. That is, innovations diffuse because of an implicit and perhaps internal logical motivation, not because an open and democratic process has determined that they are beneficial for society as a whole, even though there may be temporary dislocations and even harm to some segments."

The person is trying to say that currently, the technology is not developed enough to be a threat to anyone but the military, etc. He is saying that there is little public debate even though the AI is making their presence felt.

"What follows is speculative. Its purpose is to raise questions and to argue that a serious and ongoing analysis of the social impact of intelligent artifacts is not only necessary but long overdue. There is no shortage of discussions and analyses of the societal impact of medical and biological advances, ranging from cloning to genetic engineering, and to a host of reproductive technologies. It seems obvious that society must understand the implications of these technologies because of their intimate relation to the very basis of our existence. But except for a flourishing science fiction literature, there is very little in the way of a public discourse on the societal implications of intelligent machines."

As of me, I truly think that the debates should get stronger, and that society must understand the implication of such technology, and its consequences.

Some other material to consider:

The following issues, first raised in Rosenberg (1992) still merit attention and certainly deserve critical evaluation in the light of an accelerated introduction of advanced, and even intelligent, technology into the marketplace:

1. A realistic evaluation must be attempted of current and near-future prospects for AI applications at home, in the workplace, and in the government.

2. A similar evaluation is necessary of the impact of computer-related technology in the workplace, balancing benefits against perceived problems, including deskilling, monitoring, job loss, restricted

promotion paths, breakdown of traditional social organizations in the office, limited entry level opportunities, and health-related concerns.

3. The implications of partially realized intelligent systems in terms of the requirements placed on humans to accommodate to their, the systems', inadequacies must be considered. In the haste to introduce AI into the workplace, pressures may be placed on people to work with systems, which, while advertised as intelligent, are seriously deficient in many areas.

4. Of particular interest is the role of AI in decision-making, whether in financial institutions, in the executive suite, or in diverse military situations such as autonomous land vehicles, pilots' aid, aircraft carrier battle management (all of which are components of the Strategic Computer Initiative launched in 1983) or in the evaluation of possible nuclear attack (either in or out of the context of SDI, the Strategic Defense Initiative).

5. Intelligent systems may find ready application in intelligence activities such as automatic interpretation of tape recordings and the cross-correlation of electronic files. Added to current threats to privacy, the availability of such powerful mechanisms could increase real and anticipated assaults on individual privacy.

Social impact of human interaction with robots, for example, artificial pets, robots for the disabled and elderly by Sung-Hwan

One day in the future, robots will be a common thing in our lives. Its need will be greatly necessary that we might not be even able to live without robot. Though at present moment the robotics is in developing stage, it will be not that far away till robots are common. The social impact of human interaction with robots is broad, since robots will be in a use for many ways.

For younger children, the robots will be used as a maid. It will look after the kids when the parents are not present. The problem with this is that the time spent between parents and the children would become less, since robots do the housewife's job. The relation between the children and parents will not be as deep as now a day's parent and children relation. Some children would even be more intimate with the robots than their parents.

Though, the robots will be a great help for many children. It will do the entire house job without complains, or with laziness. It will be never late on making food, or other things. Though this does not mean our moms are lazy or clumsy, but the robots will be less likely to make mistakes. It will also provide safety when the parents are gone. It will protect the children with its life (?), and check securities at certain times. Robots might even become a playmate. They could play soccer or other kinds of sports with the children.

The social impacts on the middle aged people are lesser than other ages. The robots might be used in the careers of the person. For example, the robot might be used to organize the desk he/she is using, or check the mail box for the person. This will give more convenience and time for the person to do other things.

For the senior people, the robots will take a vital part for their lives. Each person will have an individual robot that will take care of them. Also, they won't be lonely, since they could talk with the robots or do other things with them. With the consistent help of the robot, the senior could go on a trip, or do any kind of things. They would likely to be able to enjoy the last stage of their lives. Also, there would be less accidents or injuries, since the robots will be there to help them.

Finally, for the disabled people, the robots could help them to be more sociable. If one is blind, the robot could lead him to wherever he wants. If one is unable to walk, the robot could take him in a wheelchair and travel to other places. If one is unable to speak, the robots could hear the opponent and use the finger language to transfer the message to him. Therefore, the disabled people could talk to other people with more convenience and be more sociable.

Robots will become very vital in human life. It could help us a lot, and make things more convenient for us. But, since it takes a large part in us, I think we need to be more careful and precise with making robots and letting them in to our worlds. We wouldn't like things like the movie, "I, Robot".

T167 - Social impact and ethical considerations regarding the use of robotics in medicine, for example, robotic surgery, computer-controlled prostheses by Takafumi

There would be a large social impact in the society if the robotics would take care of human. One is that we would not need a lot of doctors who do the surgery, increase in employing the mechanic

experts to maintenance the machines and the human mentality would change a lot also the possibility that the doctor would make a mistake would decrease. But in other hand there would be problems with the unemployment of doctors and over population.

If the robotics takes care of human there would be many success and possibilities that we can save many people. Especially the nano-robot that can go into human blood veins can do many things to cure some virus and other diseases. Robotics will help the people who are experts for mechanics to earn more jobs, and the factory which produces the product. They can raise more money than they use to. This means that it is economically good for the society. Which totally means that the cycle for the economy is better.

In other hand, there are few demerits. Some doctors would lose their jobs and the over population. Robotics can take care most of activities that the need for doctors would decrease and many of them would lose their job. Then the unemployment would increase and they also have to find a job. Another problem was the over population. Even now, we are over populated and if we increase the possibility that we can live, that means that the population would grow more than before. Soon we would go out of space (land) and have to deal with some other things.

Totally using robotics for surgery and human care would be really good but also make many problems too. These problems would be lack of population and job loss for the doctors. The good side is that success rate would increase and new job for the mechanic experts, which would cycle the economy would flow better.

T168 - Reliability of robotic devices, particularly in life-threatening situations. by Akira

These days robotics devices are used very often and mostly for everything. But how reliable is it under extreme conditions? You can't say that the device would always work in your favor, and under a life-threatening situation this would be critical.

The most important issue concerning this topic is security. This is because human life is the most important matter concerning this topic. For example if you are in a aircraft that is about to crash and if your auto-eject system doesn't work your fate is death, and this is because the robotic device in the aircraft failed to respond under life-threatening situation.

Another example is when there is a fire in a building the automatic fire extinguisher doesn't work because it malfunctioned. In this case it is likely that you would die because of the fire or the smoke because the fire extinguisher didn't work when it should have. The second issue concerned with this topic is trust. This is because if a certain company's product became the cause of someone's death most people would not trust that the product works, or would at least doubt the effectiveness of the product. Also if your relative or family member dies from the product you might even stop using all mechanical devices. This is an extreme case but it might still happen.

One solution that would solve these problems is to always put a manual way along with the mechanical way. This is actually used as a fail-safe system in case the devise doesn't work in real life. So even if the automatic fire extinguisher doesn't start spraying you can use the fire extinguisher manually to put the fire out to save your life.

If the device doesn't work in a life-threatening situation the maker of the product should be held responsible. This is mainly because the most likely reason of the product not working is because the maker didn't check the product before shipment. So all the blame should go to the maker. Although in most situations the maker is held responsible there can be exceptions. For example the product could have broken during the life-threatening event, such as an earthquake, storm, flood and so on. In these situations no one can be held responsible because it is a natural disaster.

One alternate decision is to not use any robotic devices but this would probably be inconvenient. So the best decision is to install manual process with the robotic device for insurance.

or

reliability of robotic devices, particularly in life-threatening situations. by Sung-Hwan

The main purposes of robots are to make them do jobs for humans who will make factories to produce products faster and efficient. It is also used in dangerous situations, such as surgery and fire emergency. Therefore, robots are used in a lot of areas, and are going to be further more used in other areas as well.

The reliability of robot varies on whether the robot is used in dangerous situations, or in normal situations. If the robot was used in normal situations, then the amount people depend on robots are lesser than in the dangerous situations. This is because if a robot failed to do their jobs, the cost for that is lesser for the normal situations, where else in dangerous situations, it might bring deaths. Therefore, we should be careful when we rely on robots in dangerous situations.

In the normal situations, robots are usually used to do a small part of the work over and over again. This is called a specialization. Even though a robot makes a mistake, it doesn't cause great casualties, since it takes only a small part in the production. I think the robotic devices are more reliable in this field of work than humans, because computers and robots are very good at doing things repeatedly. Also, robots and computers do not feel tired or other kinds of physical limitations, therefore, they would be able to work as much as the factory wants with sufficient electricity.

However, in the dangerous situations, I think robots are less reliable than the humans. The reason being, humans have the consciousness and they are able to think unlike the computers, which just follows the instruction and memory implanted by humans. I think dangerous situations often require a consciousness, since unlike the factory work, the work required here is dynamic; it can't be predicted.

Therefore to solve dangerous situation, one must have flexibility, so that they can adapt easily to the change in situation and create a new solution for it. Since robots do not have this ability, I think they are not really reliable for dangerous works. For example, when a robot is made to rescue the people trapped inside the building that is on fire, it might be implanted in its memory to rescue those who are likely to survive first. Let's say that a mother and a child are trapped in the building.

The mother would beg for the child to be rescued first, but a robot would rescue the mother first since she has better physical health than the child. It is difficult to decide whether this is a right decision or not, but there are a lot of times when we have to twist the rules to achieve the goals.

Consequently, I think humans are more reliable in dangerous situations than the robots, though using the robots would decrease the risk of losing the savor also. Deciding whether human or robots are more reliable than the other is very difficult. There are lots of different situations, so the reliability defers on each situations. Therefore we should carefully decide whom to assign the job to, since it could be a matter of living and dying.

Knowledge of technology

In order to study and evaluate the social and ethical issues involved in the use of robotics, the student must have an understanding of related technological concepts. These may include:

T169 - key terms—robot, android, cyborg, sensors by Matthew Wilder

Robot

Robot, as defined by International Standard ISO 8373, is an automatically controlled, reprogrammable, multipurpose, manipulator programmable in three or more axes, which may be either fixed in place or mobile for use in industrial automation applications. Robots in the modern world come in a variety of shapes and sizes, and are used for a myriad of applications.

Robots are most commonly used in the industrial world. An example of a robot in the industrial world is the KUKA. The KUKA, which resembles an arm, is used in the production of cars. KUKAs are equipped with an assortment of tools that allow them to paint, weld, and assemble cars. Robots, like the Kuka, are useful in industry because industrial tasks can be accurately defined and must be performed the same every time. Furthermore, industrial robots can do some tasks better than a human could ever do (i.e. lift heavy materials).

Although robots are mainly used in industry, they are beginning to appear in other environments. One such environment is the battlefield. As of last year, the U.S. military has been regularly deploying Foster Miller TALONs to the dangerous roads of Baghdad. The TALONs are used to defuse roadside bombs or IEDs (improvised explosive devices) in an operation called EOD (explosive ordinance disposal). Robots are an ideal solution in this scenario because sending a soldier to do the same job would risk human life. Robots are beginning to enter the household as well. In 2002, iRobot Corporation launched Roomba, a robotic vacuum cleaner. By 2004, over a million Roombas were sold.

Android

An android is a robot made to resemble a human, usually both in appearance and manner. The word android, first coined by French writer Villiers in his novel, L'Eve future, is mainly used in science fiction

novels and movies. Some popular androids in the sci-fi world are Data from Star Trek, the Terminator played by Arnold Schwarzenegger, Mega Man from the game Mega Man, and Cell from Dragon Ball Z. Recently, however, androids have begun to make appearances in the real world. One such example of a real android is EveR-1, created by a team of scientists from the Korean Institute for Industrial Technology. EveR-1 is capable of emulating human emotions and having basic conversations (the robot has a vocabulary of four hundred words).

Cyborg

According to the Encyclopedia of American History, cyborg is short for cybernetic organism, which is the melding of man and machine and ranges in scope from creating computers that have human attributes, such as independent thinking or the ability to learn, to the artificial heart, pacemaker, and a variety of synthetic implants.

Sensors

A sensor is a transducer, a device that converts one type of energy to another for various purposes including measurement or information transfer. In a broader sense, a sensor is sometimes defined as any device that converts a signal from one form to another. Sensors are used in everyday life. An example of a sensor is a magnetic sensor, or a compass. Another example is the thermometer.

T170 - Determining situations in which it is more appropriate to use a robot than a human being by Andrew Leung

There are many dangerous jobs in the world, and all should be done by robots to make sure that a person does not get hurt or even die from doing what they were taught to do. Jobs like building a sky scraper to going down in a sewer system to unclog a pipe are dangerous jobs that have cost many peoples lives these days. The more dangerous the job the more the need for robots there is and with out robots many people will die from working those jobs.

For plumbers or people who work in the sewers, they usually need to go inside the sewer and unclog a section of the sewer because it is clogged up. When a sewer system is unclogged, sometimes the sewer water floods the pipe drowning the plumber and ultimately killing him. With a robot repairing sewage pipes or unclogging them the robot will not drown, but just be soaked in icky disgusting water and have to be cleaned afterwards. The robot can be remotely controlled by a plumber and so the plumber will not be hurt or killed when they are working in the sewage pipe.

For iron workers, people have fallen off of accidentally been hit off the scaffolding of a sky scraper. This job accounts for 10 percent of the deaths of people in the USA. Though iron workers can be replaced by robots, it will undoubtedly slow the work down and therefore take a longer time to finish a building. Robots have the problem of balance, and precision movement along a beam as many iron workers must do to work on the beam. When a robot reaches the destination on a beam they are undoubtedly going to work slower than a human because the robots can only move so fast to apply bolts or drill holes through the beams. This is one job that robots could be bad for.

Truck driving jobs are also dangerous to people. Truck drivers are often in accidents and usually killed in the accident because of the speed at which a truck travels and the load it carries on its back. Robots could do well driving trucks on long journeys such as going through route 66. Truck drivers often doze off when driving the trucks because of the monotonous road ahead and end up trailing off to the side into another truck or tumbling off into the desert. Robots will not tire and will drive all the way with no problems. A truck driver could be present to take pit stops and release the pressure within tires and then get back on the road and just sleep all the way to the destination. Robots could be integrated into the car and programmed to drive long distances with out having to stop.

Guards also could be replaced by robots. Let's say guards of a bank are present and there is a heist on the guard's duty. Usually the guards are shot first and then the money is taken, but with robots as guards they could be shot and they will still stand to shoot the robbers and everyone will be fine. How a robot will be programmed to know a robber when there is one I do not know, but it would be a great invention and save many lives. The best I can think of is maybe a Robocop for a guard…

T171 - Types of input/output peripherals used in various situations, for example, arms, fingers, voice, wheels by Kent

Along with the development of technology, many input and output peripherals has developed. The most common and basic ones in most things are finger inputs such as keyboards or switches and

visual output. However, there are many more kinds of input and output peripherals that have been invented.

The input peripherals of fingers or arms includes keyboard, pointing device such as mouse and trackball, and joystick that could often be found in game controllers. Touch screen is also an example of those. A rather new finger input peripheral would be wheels. It could be found of i-pods.

While those finger and arm input peripherals are the most common ones, there are many other input peripherals. There also are voice input peripherals which would be a microphone. Two dimensional images on papers could be inputted by scanners as well as three dimensional image by camera or webcom in which case it would not be a mere image but a series of image, movie. Other input peripherals would be barcode readers. Like a scanner, it consists of light source and reads off barcode written on a surface. It works the same for cell phones to read off QR codes. Similar technology is used to read some card (for example a train pass) that can be read by certain peripheral.

Another unusual input peripheral would be the brain computer interface. It is the technology to connect the brain and computer by certain electrodes pieced into the brain that reads any nerve pulses. It was successful to use a computer without any mouse but only by brain pulses. There also is a mechanical arm connected to implanted electrodes in the brain that moves the way you would move your fresh arm.

The output peripherals are mainly divided into printing, sound and visual. First of all, printing output peripherals includes obviously printer. Secondly, sound output peripherals would be speakers. Thirdly, visual peripherals include the display monitor. It is apparent that there are less output peripherals than input peripherals. However, the brain computer interface comprise not only of inputs from the brain but also outputs to the brain.

The brain computer interface can send certain electric pulse into the brain. For example, there are bionic eyes that transform the image data from eye-like cameras into nerve pulses and sends it to the brain through the implanted electrodes. This allows blind people to see images, and since these images are from a camera it is much clearer than fresh eyes. The same works for cochlear implant which is for the ears. The mechanical arms can also send back the sense of touch and heat to the brain. Thus, brain computer interface allows to output certain senses directly into the brain. This brain computer interface would probably be common in a few years or a decade.

In conclusion, input and output peripheralsis the most important aspect of technology because it is how we humans communicate with the technology. Any technology is obviously useless without it. Your calculator is useless if it did do the calculation but did not output the answer to you. Thus, it would inevitably develop together with the inside part of technology.

T172 - Reasons why robots are/are not designed as androids with human-like form by Raymon

Robots seem to be the epitome of human progress; sure, there is medicine, construction, and physics, but ever since Aristotle, the idea of bringing an inanimate object to life as our slaves has hung around. Necromancy, Frankenstein, and mind control – these are all methods of getting your way with minimal effort. The idea of robots appeared a little later than these spells from witchcraft, but still before microprocessors. The Tin Man, for example, from the Wizard of Oz, could have been considered a robot.

One thing that we can notice about all these fantastic electronic butlers is that they have always been portrayed in one form or another as humanoids. Perhaps this is because we want to create them in our own image, or perhaps it is because we want something that can do everything and the human body is very versatile. Nonetheless, it is immediately apparent that useful robots, nowadays, do not have humanoid forms, except for the Honda Asimo. The Asimo is an incredible piece of engineering, but it is incredibly impractical and really does no useful tasks except perhaps walk the dog.

Where in the history of the formation and engineering robots has the original image been skewed? The answer in this lies in specialization. In economics, we learned that people specialize in their jobs to reach maximum efficiency as a society. Billy does farming, Joey makes shoes, and Harry fixes toilets; that way, Billy can become really good at farming and Joey can become a master shoe smith(?) and they can trade their goods. With robots, it is the same concept, except in a more extreme form. If Billy, Joey and Harry were three robots, Billy would have a hoe and a rake for arms and would roll around everywhere, Joey would have hammers for arms and would spit nails, and Harry could have a neck 5 meters long with a squishy head. In this way, all the robots can achieve maximum

efficiency without any useless functions and the idea of having a humanoid robot that can do everything seems pretty stupid. Of course, we still dream of the Robo-Butler 2000, and that is what the Asimo is striving toward, but it is much easier, at this time, to create specialized robots.

The Roomba, the famous vacuum cleaning robot from iRobot, ONLY vacuums floors, and it is physically limited from doing anything else; it only has a vacuum cleaner attached. The Scooba washes the floors, and that is all it can do. iRobot did not combine these robots, since that would be much more expensive and would result in a larger robot. The Sonicare factory's robots consist of a large number of multi-limbed machines spinning and sticking things together at incredible speeds; they definitely are not humanoids, but they do their jobs admirably.

Finally, it is just so much easier to create robots with wheels instead of legs. We do not move with motors; we move with muscles that contract and relax, so until actuators (Mechanical Muscles that contract to move objects) are perfected, the humanoid form is very unstable and inefficient. Motors are good for rotating things, not moving limbs and lifting heavy loads quickly. Therefore, it is obvious now that non-humanoid, specialized robots are better suited to make with today's technology.

T173 - The capabilities and limitations of robots with respect to vision, touch, sound and movement by Andrew

Robots are generally used in the world nowadays to do things such as building cars and or other jobs that could be dangerous to a human being if they were to work at that job. Most robots that do a job nowadays are programmed to do everything one way and just repeats itself after the first cycle of movements is done.

Robots given vision will be able to see where the robot itself is going if it is moving at all. It will give the robot a vision that can probably zoom in to see things that are small from where it is standing. With the vision on a robot the robot could infiltrate a building and with its vision could show what is inside the building and help people in wars, terrorist situations or anything that is dangerous. Vision can also give the robot a sense to move on itself without a human’s guidance. Though the robot must need some thing to do like walk up stairs, press a button, pull a lever or the robot has nothing to move for or look at.

Giving touch to a robot will give the robot a sense that most all humans have. Instead of being numb and not feeling any pain, the robot will feel what they are touching and could feel if they are pressing too hard and going to crush the object or not. With the sense of touch, robots could replace people in the ER that hold down the parts of the body that are bleeding out and not crush the person’s body part. Touch could also give the robot a sense of being in pain if it can even compute what it is. It could introduce a level of pain and what type of pain.

Robots given the ability to hear sounds could do many things such as have voice recognition it could listen to a command a human gives or other robots. The other robots don’t have to speak using a human language, but could just use simple beeps that are understood by other robots and then they would do the command they were told to do. The commanding robot would slightly be different from all other robots that are under it, for it to be able to command the lesser robots. Sound recognition is a cool thing to have in a robot. Though if you were to say something wrong you will be in a bad position because you would have screwed up. For example, you could say “I am going to get my robot to kill you” and the robot activates and kills your friend.

Movement in robots could only be put in if they are given vision, or a sense of touch. With out either of these the robot could not operate itself. This is because if it were to move anywhere with out any type of vision or sense of touch, it would walk into a wall, off a cliff or anything that could get it no where. Robots could always be controlled by humans, but the point of robots is to have them be able to do things themselves without the help of humans doing much anything then giving a simple command.

Given all these things, robots could work on their own and not need much of the humans attention. The only bad part is that if the robots some how are able to create themselves and give themselves a mind that is made to be against humans. That would lead the people of our world to die out because then the robots would start ruling over the world. Which is actually a very scary situation if robots could think. Only if robots like the ones in I, Robot, are like the ones we make but with out their own sense of thinking. And of course no daily updates from a central computer.

or

the capabilities and limitations of robots with respect to vision, touch, sound and movement by Taro

2.4 Integrated Systems:

The primary reason for the production of robots is to enhance our standard of living. Robots have the ability to do that because of their multifunctional features. When constructing them, the robotic engineers put every effort to include certain properties so that their final products would be qualified as 'robots', not just 'machines'.

Three key properties of a robot (according to Wikipedia) are "sensing its environment, manipulating things in its environment, and making choices based on the preprogrammed sequence or the environment its in." It is a must for any type of robots to have at least the above characteristics, whether they come in forms like Asimo or forms like ordinary machines. If they are programmed the fundamental points, from there various motions (both internal and external) can develop and thus the capabilities become numerous. First let us take a look at the aspect of vision.

We might note that for this, robots are far more better than humans because depending on their structures, they can see things in a wide range while humans have a limited scope. In addition, sometimes the robots are able to zoom into or out of objects. So areawise the robots may be superior, but if we consider the colors they can recognize, it is often the case that the recognition is poor.

The scale of color is not programmed specifically. However we would still say that regarding vision, robots outshine humans since they are capable of seeing through things such as bulidings and also their eyesight never get poorer as long as they are constantly charged, unlike humans who do start lacking eyesight as they get older.

Moving onto the issue of touching, we now get to notice some obvious limitations of both robots and humans. Supporters of robots may claim robots cleared the difficulty that humans experience when touching extremely cold or hot objects. Indeed they have, but robots have their own drawback which is the fact that they cannot feel pain. This sounds like a positive feature, but living without pain means the robots do not get any sign of warnings.

Improvements are being made, for example engineers program stuff so that whenever the robots receive certain amount of shock, they react quickly to minimize the damage. Just as a trivia, in the movie 'A.I.', there is one scene in which robots with artificial intelligence are getting destroyed. Before they face their end, they switch off their sensors for pain because they conclude that they would no longer need it. Although the movie is based on a fictional story and the setting of it is long ahead in the future, the day might really come; robots having one simple switch for sensing or not sensing pain.

Limitations involving sound would be shown strongly in humans, because compared to some of the latest robots that have a lot of capacity, they cannot pick up much sounds nor interpret simultaneously. If we concentrate purely on the quality of the sounds that humans and robots create, we can say that robots have consistency than humans.

However humans are usually better at speaking with correct intonation. Lastly, we look at the movements of robots. With relativity, it can be said that robots are very slow and they lack variations. Mistakes are common too. In one robot show, Asimo (two-legged robot) was introduced and it was ordered to walk down a simple stair, but it collapsed after going down one or two steps.

or

the capabilities and limitations of robots with respect to vision, touch, sound and movement by Aditya

A Robot is usually an electro-mechanical system, which, by its appearance or movements, conveys a sense that it has intent or agency of its own.

Robots do what they are programmed to do. The builder writes an algorithm based on which the robot acts.

Vision:

A robot usually doesn't see things and make decisions and judgments based on what it sees. It merely sees things on a mechanical or survival outlook. Through a camera, or in some cases, a motion sensor, they can sense the presence of objects, or as in the case of the advanced ASIMO robot made by Honda, it can sense speed and direction and when it senses the presence of an object of humanly proportions, it greets them. It can see recognize up to ten faces.

Sound:

The ASIMO robot is one which can distinguish sounds. This makes up for its lack of being able to visually distinguish people in decent number. It can also recognize sudden unusual sounds.

2.4 Integrated Systems:

Touch and Movement:

It can recognize terrain and uses this as basis for the movements it makes. An example of terrain recognition would be the recognition of a flight of stairs.

There is a robot at MIT which is capable of sensing emotions. Although right now only few are the emotions, it is interesting how the system works. The robot delivers responses based on the tone of the statement spoken by the human speaker. They are increasing the number of emotions it is capable of handing. So all in all, with more clever algorithms and cheaper parts there's a lot left for robot coding to go.

T174 - Processing power in relation to the capabilities and limitations of robots by Andrew

The processing power of robots is limited to their size. The smaller the robot the smaller the processing power and the bigger the robot the bigger the processing power. Though, how much processing power is needed in a robot? And for what kind of robot are we talking about? But also as technology grows there will be less space needed to be taken up by robot parts because we will be able to make parts smaller and more efficient.

According to my sources, by 2010, robots will be able to have a processing power of about 3000 MIPS or millions of instructions per second. This is about the intelligence of a lizard. These robots which are relatively large, about half an average human size, will be able to carry out basic tasks such as cleaning, delivery, or even basic factory jobs.

In about 2030 a robot should be able to have about 3 million MIPS. This is the equivalent intelligence of a monkey. These robots will be able to generally understand things of the world. It can define items from other items, and what each one is for. For example, if the robot sees an egg, it will be able to see and learn that it must be picked up gently so that it will not break. These skills will be learnt through simulation and practice to perfect new tasks before attempting them. The robots will also be able to read a general facial expression and mood of the person if the robot was a maid. The robot can also be a maid.

By about 2040, robots will have an MIPS of about 100 million, which is the equivalent of a human. The robots will be able to speak and understand speech and also think creatively. Not only can they do what was explained above, but they will also be able to anticipate what will be results of their actions far in advance. This is a good thing because if the robot had thought of killing someone, it would know that it would be decommissioned. With the reasoning power that is given to the robots, hey will be at or even beyond the human level and so generally the robots will be as competent as people.

The only thing about robots is that they will not have the fast reactions for they have to calculate everything before making a move and by that time, what ever that was going to happen would have happened. Though in some situations, it would be useful for a robot to be around. Something such as bomb defusing, the robot could defiantly calculate the chances of the bomb going off and make a smarter choice then a human. If the robot were to have done the wrong thing when defusing a bomb, there will be no loss of a human which is generally the most important thing to the human race.

After a while if we do le the robots die, we as humans will need to build in a code that makes robots sacrifice themselves for human beings. This is because if we do not, the robots will later on learn of what we are doing to their robot friends, and will not save us but instead cower away and not do what they are told to do. Robots are the coolest idea that could have been created, but they will be hard to control.