Book: Physics of the Future

Documentary: What Will the Future be Like Nova

In the book Physics of the Future it talked about the advances of technology from the early 1900's all the way to the year 2100. It was discussed what we may expect from technology within the next century.

The book started by talking about computers and how the computer chip will advance the world. Michio Kaku predicts that the computer chip will continue to shrink until Moore's Law collapses but by that time computer chips will be so cheap to make and small that they would be implemented into almost anything. THis includes humble everyday items like armchairs, glasses, mirrors and whatnot to do different tasks like record sleep patterns, save space by getting rid of clunky computers and detecting diseases like cancer before they become a threat. Chips the size of a grain of sand one day may help cure cancer in the body without a surgeon having to even make an incision into the body and blow in the wind detecting weather patterns. The possibilities are endless and only increase with more computing power and the rapid advance of technology.

In another chapter Michio Kaku spoke about artificial intelligence and how the dream of housemaid robots and automated work forces would come to fruition maybe not in this century but they will one day become a reality. He wrote extensively about how in the past we have been promised our own robot servants which would do our bidding but every time the promise was made the technology failed to become reality. This is because conventional computers lack the common sense and the analysis skills that even earth's simplest creatures have. For example, a computer lacks the common sense that a string can pull but not push, sticks can push but not pull, spinning makes people feel dizzy, animals cannot speak and can understand english, children like sweets but not punishment or you wash your body but not your eyes while taking a bath or shower. These are just examples of common sense that can be assumed and don't really need to be learned by people.

Another thing that computers fall back from is their intrinsic design. Computers are extremely fast at linearly doing tasks. Put a week computer against a human and ask both to calculate 10+10 the computer will always come out on top. This is because computer speed is limited by the speed of light and friction but a human's brain only operates at about 200 miles per hour. The difference though is that a human brain works by having hundreds of billions of neurons all connected with each other doing tasks in parallel. This means that if you gave a super powerful computer and an infant a picture with and asked them to identify an apple in it the computer would be left in the dust. This is because even a small amount of neurons working in parallel can do multiple things simultaneously while a computer has to finish one task before doing another. It is amazing in fact the level of computations going on at any given time that you don't

even think about. Examples being that when you start your day you know not to trip over a shoe irresponsibly placed in the middle of the floor or when you're driving to work you make valued decisions on how to operate your car, or when you choose to go out for pizza instead of ordering it. These are just a few of the things you may do on a daily basis not even including all the calculations done for basic upkeep of you body like walking, blinking, sweating etc... All of these things may one day be overcome with the invention of different types of computers like quantum computers and make our dreams of robots a real possibility but this is far off.

The book later goes on about the future of energy production and how it will open the doors to the universe around us to expand. An important point made was the that the ways to energy has been produced in the past has caused detrimental effects on the environment today and will possibly hurt the planet if nothing is done.

I next watched a documentary on what the future may hold by Nova. In the documentary it touched on basically the same topics as the book did. It gave insight into the inner workings of the robotics world where scientists, engineers and people of all sorts are working to make intelligent machines. At the current state it may be better to define these robots as "smart" rather than intelligent. Intelligence does not have a strict definition because it can be many things, but for robotics it is often defined as the ability to think freely and comprehend. The robots being constructed currently are not intelligent. They are smart though. They can take a scenario and through a system of equations and complex coding make results based on the present circumstances. This is shown with robots that "learn". For example, teams from all over the world set out every year to make robots that can play soccer. The competition may seem adolescent and childish but getting a robot to compete in a soccer match with other robots includes many hurdles. The robot must be able to analyze its surroundings know where the ball and other robots and obstacles are, make it's own path on where to go. If it gets knocked down it needs to know how to get back up regardless of what fashion it is laying on the ground and be able to communicate effectively with its other robot teammates. So far substantial progress has been made and the goal is to make robots that can interact with humans on a day to day basis doing various activities.

The documentary also spoke about the coming of mind controlled devices and mind reading. The blooming technology is in its infancy at the moment but shows potential. Using electrodes implanted directly into the part of the brain that controls movement and amputee was able to control robotic arms effectively. In another case a person was able to use their brain signals to move a cursor on a computer screen. Again this tech was shown when a person was shown an image from a list of images that a computer has, this was done in an MRI machine to see where there was brain activity and then have it analyzed by computers. The computers were able to compare the areas of the brain where the brain was active to predicted locations used when a person experiences things like touch, food, danger etc... This information was then used by the computer which then displayed a result of what it thought the person was thinking such as an apple and over 80% of the time it was correct.

Perhaps this technology will advance so much that in the future devices that allow us to do this will be almost invisible and allow us to effortlessly control things in our lives appliances in our kitchens or allow emergency response teams to control robots to do the job instead of endangering another life. Only time will tell.

Overall the documentary and the book were pretty consistent with with each other. The future holds a lot of potential but the only thing that will help these fantastic technologies become realized is through the pursuit of science and funding for things like these.