The Internet of Things

Date: 09/23/16
Subject: Computer Engineering
Citations:
Kobie, Nicole. "What Is the Internet of Things?" The Guardian. Guardian News and Media, 06 May 2015. Web. 23 Sept. 2016.

Summary:

The Internet of Thing seems to be "the next big thing", the Internet of Things (IoT) is the development of the Internet where everyday objects are equipped with networking capabilities allowing them to connect to a network to send and receive data. Internet of Things devices (IoTs) are safe as of right now due to their limited use; however, these devices can collect an immense amount of personal data and potentially pose a threat in the future. IoTs will change the way businesses work, making tools more efficient and productive. IoTs are also having an impact with healthcare, Smart Pills and monitoring devices are already being used to save lives. IoTs also connect to the cloud and remote data center to complete processes or store data.

Analysis:

Imagine waking up and getting out of bed where the blanket sends a command to the floor to heat up. Then as you walk to your bathroom sink depending on your calendar your closet brings up your clothes (a suit if you have a meeting or swim trunks if you have to go to a pool party). As you brush your teeth your mirror analyzes your facial micro expressions, using machine learning, properly deciding what type of cereal you want for breakfast then sends the cereal name to your kitchen where a bowl full of that cereal is ready for milk but waits to pour the milk until the stairs send a command so your cereal doesn't get too soggy. That is the potential of IoTs. The development of IoTs will lead to improved sensors, development in network technologies, security risks, and a vast change in the way we live.

Sensors are a vital part of IoTs, they are the key to enabling devices to detect what is occurring in their environment. With the growth of IoTs the sensors will become more efficient in order to complete their tasks faster getting closer and closer to almost instantaneous responses. A sensor that takes 5 minutes to recognize that there is a person inside its range will might not be able to respond to the stimuli while it is still in range, compared to a sensor that recognizes a person is in its range in 5 milliseconds will be able to respond virtually instantly to the stimuli. These sensor enhancements can make the difference between an IoT security device alerting the police of an intruder while the intruder is still in the building instead of after the intruder has left. There is already an abundant variety of sensors however IoTs will lead to the improvement of sensor technology.

Networking capabilities are what make up the "Internet" part of Internet of Things devices. Without networking capabilities IoTs are just regular everyday objects, due to this a IoTs will lead to the development of networking technologies. Currently there are a variety of wireless connections including (but not limited to): Bluetooth, RFID, NFC, Wi-Fi, Cellular, and Satellite. IoTs usually connect to the homeowner's WLAN (Wireless Local Area Network) with Wi-Fi and then communicate to the owner's other devices through the internet, IoTs also use the internet to connect to cloud services and remote data centers. There is potential for IoTs to connect with each other through PANs (Personal Area Networks) and not require to connect to a WLAN. When the blanket needs to send a signal to the floor, instead of travelling to the router and then to the floor it would instead connect with the floor using a PAN and send the command directly to the floor. There are already developments in PAN technologies that are furthering this possibility, recently Bluetooth Low Energy (BLE) was released. Bluetooth LE was a new form of radio wave communication that allowed a device to have a large range yet use very little energy by efficiently use power. There are many other types of PAN and close range networks that will advance to enable IoTs to connect with each other and more efficiently get tasks completed.

IoTs that accomplish these tasks will collect colossal amount of personal data, from the way you like to brush your teeth to how you look depending on your emotion. With the amount of data these devices collect there is a lot someone can learn about a person. Thieves could potentially learn your daily schedule to know when you're in the house to commit crimes. Ad agencies would want your information to learn more about you and what products you use. Due to the monumental amount of personal information IoTs will gather, they have the potential to be extremely valuable and become targets of hackers with various intentions.

While IoTs will usher a wave of development with sensors and networking technologies and bring in new security risks it will also bring a massive change to our lifestyles. With IoTs there is potential for complete automation of regular day to day tasks and even smart cities. Smart cities are urban development vision to integrate multiple IoT solutions in a secure fashion to manage a city's assets. IoTs could be placed in roads to detect speeding cars, negligent drivers, and even stop accidents before they happen. IoTs can be embedded into buildings and bridges to detect structural defects and potential points of failure and save lives. IoTs can even be installed in utility pipes to detect gas and water leaks to avoid damage and harm. IoTs will revolutionize the way we live.