To Surveil or Not to Surveil

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Since 1980, technology has vastly improved the use of surveillance capabilities to affect the lives of many Americans. As innovations have improved, surveillance techniques have increased in the day to day lives of individuals. Often these improvements are hardly noticeable or rarely considered. Surveillance cameras and data mining have both slowly become so common over the years that people fail to understand the extent to which they have been affected, are affected, and will be affected in the future.

In the 1980s, video cassettes recorders, or VCRs, were used to preserve surveillance camera images. However, the tapes had recording time limitations and had to be changed or rewound often. If the tape was rewound, then the previous recordings were lost as the new recording taped over it. Repeated recording would also wear out the tape. In the 1990s, digital technology replaced analog technology. Digital video surveillance was not only better quality but also allowed for continuous recordings for up to a month using hard drive storage. Banks, store owners, and other businesses appreciated the surveillance cameras as their capabilities increased with digital advances. Also in the 1990s, Digital Multiplexing made it possible for several cameras to record at the same time (Roberts).

These advances in surveillance camera technology have caused surveillance cameras to proliferate in our cities. In September of 2009, James Vlahos, a writer for Popular Mechanics, stated that: “There are an estimated 30 million surveillance cameras now employed in the United States shooting 4 billion hours of footage a week” (Vlahos). A 2007 poll by ABC News and Washington Post stated that 71% of Americans wanted an increase in surveillance cameras (Vlahos). The events of September 11, 2001 increased the demand for surveillance and programmers developed facial recognition software.

Surveillance cameras are used by governments to help solve crimes and as a deterrent to prevent crimes as well as for public safety. Government buildings are monitored with the use of surveillance cameras to catch suspicious behavior. Businesses use surveillance cameras as well to prevent and deter crimes. However, the most effective use of surveillance cameras is after the event has occurred to see who did it and to track them down. In the July 7, 2005 London subway bombing, surveillance camera recordings were used to lead to the arrest of several of those involved (Vlahos). After the April 15, 2013 Boston Marathon bombing, surveillance camera video provided law agencies with the images of two suspects (Boston Marathon Bombings).

Clearly surveillance video can provide a valuable service to society; yet surveillance cameras are so common place that people do not realize just how much of their lives are being recorded when they are simply minding their own business and doing what they do. James Vlahos wrote about his stay at the Talbott Hotel in Chicago which has 70 surveillance cameras installed. Later the manager of the hotel had no problem pulling up video of James checking in at the desk, walking to his hotel room with his luggage, and waking through the hotel on his way to breakfast. This hotel used video software called 3VR to analyze large amounts of video to quickly find James amongst all the other guests. 3VR is basically data mining of video data (Vlahos).

"The term data mining was introduced in [the] 1990s…[along] with the introduction of data warehousing" (History of Data Mining). Currently, however, the term knowledge discovery is often preferred. With the increase in data storage and the resulting overwhelming amount of data, arose the necessity to process the data in a useful way to gain information. Data mining, or knowledge discovery, analyzes large amounts of data to discover useful patterns. Some of the objectives for data mining include: "to explain some observed event or condition, to confirm

hypothesis, and to analyze data for new or unexpected relationships" (Hoffer, Ramesh, and Topi 419).

This data, often in the form of facts, numbers, text, or video, can be used for economic and governmental purposes. Economic uses tend to be to increase sales for businesses or to protect sales. Businesses can gain information on which products sell more on certain days than other days. For example, a grocery store chain in the Mid-west analyzed sales receipts with data mining software included in Oracle's database software. The pattern was found that many people did their major shopping on Saturday; however by Thursday they came in for items they had run low on. In this example, the customers had run low on diapers; interestingly they would also often buy beer while they were there. This noticeable demand for beer and diapers on Thursday told the store manager that sale pricing on Thursday for diapers and beer was not necessary (Frand).

Companies like Google, Apple, and Amazon learn the tastes and preferences of individual users of their websites through data mining. These companies keep track of what topics or items an individual searches for, looks at, or purchases. This information is then used for advertisement placement each time that same individual uses the company's services or any website that has advertisements. A first hand example would be that I am now receiving advertisements from DeVry University while on YouTube. The first essay that I did for this class had me research four colleges, and DeVry University was one of the four that I picked. Facebook also uses data mining to get more information from their users. If the individual does not give their city or their place of employment, Facebook will make guesses based on where friends live or are employed. Credit card companies can use data mining to discover patterns of the card owner for purposes of protection from fraud. If there is a large change in the card

purchases, the card company can call the card holder to verify the purchases. For example, if the card holder lives in New York and charges start to appear from California, the card company can contact the card owner.

Many companies offer data mining software such as previously mentioned Oracle and 3VR. Even free data mining software is offered such as Orange, Weka, and RapidMiner (Imanuel). Driftnet is data mining technique that actually extracts data from the current network traffic which is one way that companies or governments collect data to be mined. As it gathers tons of information the use of it is ethically questionable.

The outlook for the future is more and more surveillance cameras and data mining. With the popularity and improvements of cell phones and cell phone cameras more surveillance is possible in the future. Anyone with a cell phone camera can start taking video at any time (Roberts). Security cameras are getting smaller and less expensive which aids to their adoption. Many home owners have purchased security cameras to watch their porch for potential mail thieves. Computers will continue to get faster, so data mining will perform even faster. Cloud storage will get cheaper allowing much more data to be gathered inexpensively. Unless limits are applied to surveillance cameras and data mining, which is doubtful, the public can expect their privacy to continue to erode away.

Surveillance of the public through both surveillance cameras and data mining can be used to protect people and businesses and is sought out with safety in mind. Yet, there may be a point where it goes too far when the public is inundated with it. Privacy is not what it used to be. Google and Facebook do not have safety in mind with their data mining. Ben Franklin once wrote, “They that can give up essential liberty to purchase a little temporary safety, deserve

neither liberty nor safety" (Buchanan). If only Ben Franklin could have shared his wisdom regarding surveillance cameras and data mining.

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