Lawrence Artl III
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Assignment 1-3
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Assignment 1-3: Solving a Problem with A.I.

I often let my mind wander while I'm out and about in my busy days, people watching and observing my environment. Sometimes I consider a scenario in which something potentially bad could happen to me, typically involving "bad-actors" causing harm to myself or others in a public setting (think "active shooter" or "robbery in progress"). What would I do in a situation like that? What *could* I do? What actions should I take to maximize my survivability in the situation? It may seem like a dark thought, but the reality is these are things many of us face everyday, and increasingly more so in today's world. Here I'll explore what would be necessary to potentially help an average person survive these scenarios using intelligent algorithms and artificial intelligence.

To explore a solution to this problem I considered the film "Minority Report" in which a police department of the future uses psychics to predict crimes before they happen. In this world, the police apprehend the suspect even before they commit their crime. While many elements of the film are very much based in fantasy, some can be considered for a solution with Artificial Intelligence. The main axiom of the film was that future behaviors could be predicted; AI is a broad topic that includes Machine Learning, a type of learning used to train algorithms to predict future outcomes and solutions. Therefore, this technology could be used to potentially predict the future behavior of individuals using data inputs as a training device.

The first requirement of this proposed system would be to develop algorithms that will take in data to evaluate various documented situations of the type listed above. This is done to help the system learn the outcomes and what mitigating factors most correlate to the outcome. This data would include the location, time of day, weather and other environmental variables. It would include demographics of individuals involved, how they were acting just before the

incident, and what they were wearing. Data will not include items that would not be available to a bystander at the time, such as the individual's social media posts, political leaning, mental health, or other private information. The idea behind the system would be to predict situations based on the information that a regular person would have, and nothing more.

The system would also need to be trained to recognize the various data points listed above when given the opportunity to view the environment. For instance, using CCTV the system should be able to discern the age and gender of an individual, recognize various clothing types and potential weapons, and understand the differences between different exhibited behaviors. Likewise, the system should also be able to map the environment that it is in, recognizing exit and entry points, as well as suitable hiding spots. Considering that the system would be deployed to a mobile device for maximum usability, OTF mapping and processing will be important.

Once the system has been trained to recognize all of these factors and ultimately predict the outcomes with high accuracy, decision making can proceed. The ultimate goal of the system will not be to just predict the potential for a particular outcome, but make decisions about what to do in the event the predicted outcome happens. By taking in all of the environmental data regarding physical layout of the location, the system can provide a plan-of-action for the user in order to maximize their survivability in the situation that is predicted to occur. The system would also be able to learn from its own observations, and make better predictions and solutions in the future.

For a system of this type to work there would be a lot of data points needed regarding all manner of situations like those listed above. The system would also need some sort of visual component for input of new data points during use, and then a way to output potential plans-of-action to the user. A pair of smart glasses with small cameras could serve as the interface through which information is taken in, and displayed after predictions and calculations are made.

The most obvious ethical concern would be the prediction that a person could potentially commit some sort of dangerous act on others just based on the surroundings and their own behavior or look. This would absolutely result in many false-positives and could even cause unnecessary violence or apprehensions by law-enforcement. Not all situations escalate to the proposed predicted outcome, but individuals may still act as the situation was an inevitability, causing panic, fear, and the avoidance of many social situations and environments deemed dangerous by the algorithm. Likewise, if the algorithm were to suggest a plan of action that involved causing harm to the predicted assailant, even before the situation escalated to a point where such action was necessary, this could lead to unwarranted assaults and removal of freedoms of many individuals. Essentially, everyone would now no longer feel like they have control over their own lives and freedoms, as it would appear that an algorithm would be determining their future actions.

Human emotions play a large part in our decisions in everyday life. This proposed system would have the goal of removing the emotional, biased part of our decision making when considering potentially dangerous situations. However, this system would likely create a whole new set of problems wherein human emotion and bias factor in, and the only way the system would work perfectly would be in a completely controlled “police-state” style society, which is absolutely not what this author or anyone else wants. Ultimately, this system is a fun thought experiment, but nothing more than that.

Sources

Gulli, A., & Pal, S. (2017). Chapter 1. In *Deep learning with keras: Implement neural networks with Keras on Theano and tensorflow*. essay, Packt.

Burnham, K. (2020, November 10). *Artificial Intelligence vs. machine learning: What's the difference?* Northeastern University Graduate Programs. Retrieved August 28, 2022, from https://www.northeastern.edu/graduate/blog/artificial-intelligence-vs-machine-learning-whats-the-difference/