William & Mary

Predictive Analytics Reflection Paper

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In the book *Predictive Analytics: The Power to Predict Who Will Click, Buy, Lie, or Die* has taught me a lot about the applications of predictive analytics and how it can apply specifically to the field of computer science. A lot of what the book has taught me was there are a lot of underlying ways that predictive analytics can be used that isn’t immediately obvious. Specifically, in the ways the Watson computer uses predictive analytics to achieve what many believed to be an impossible task. Overall, I have seen many more application of predictive analytics in computer science now that I can recognize its full potential outside of classroom examples.

This book meant a lot to me mainly because of the ways it related predictive analytics to other fields such as computer science. As a computer science major, I have used many algorithms and various problem-solving methods to solve well defined problems. However, I learned that real world problems are often the most difficult to solve when they are not well defined. This was the case for IBM when designing Watson. The main challenge of creating AI that can solve almost any problem that’s thrown at it is the extreme amount of information that is available to it. As a computer science major, these challenges would prove to be almost impossible without the use of prediction. Algorithms function by knowing the solution to a very specific type of problem and can accurately and rapidly find the answer, however this is very different from the problems Watson had to solve. This type of predictive thinking taught me a lot about different ways to approach a problem that doesn’t necessarily have an easily computed answer. I think that this will cause me to look at problems I have as a programmer in a different light and see the ways an answer can be achieved by getting the best possible guess instead of the guaranteed correct answer. Thanks to the immense processing capability of modern computers, this gets even easier every day.

In my future career I hope to work in cyber security. Predictive analytics is especially useful in this sense when determining what is identified as a threat. Similar to the confusion matrix examples we had in class, predictive analytics can be used to determine if there is suspicious activity going on in an account, and shut that account down before any serious harm can be done to a system. A lot of the predictive systems I learned about in the book are extremely useful in these cases as I’ve seen in many of the examples. I think the most important takeaway from all the examples in the book however is the thought process that goes behind breaking a problem down into several steps that can be analyzed and systematically used to solve future problems that are similar. By using these methods, we eliminate the risk of human error, and can better survey increasingly massive amounts of data created every day, which will lead to more accurate predictions.

With the varying types of questions and various methods employed by the computer to find potential answers, the computer needed an easy way to select the correct answer. Watson was able to leverage predictive analytics to take the 10,000 possible answers and predict the correctness of each answer. It did this by collecting thousands of answers and the evidence for or against each answer. Then, by using predictive analytics and thousands of answers it was given to train the model, it can select the one that is most likely to be the correct question and answer pair. Using predictive analytics in this way has drastically affected my preconceptions about the topic.

Before reading this book, I assumed that predictive analytics was all about making graphs and visually looking at data so humans can make better decisions. I didn’t know the power of things like confusion matrices regression analysis. This book has shown me that there is an almost infinite number of ways that predictive can be used not only to make basic predictions, but to use thousands of variables to create one decision. I also didn’t realize the sheer scale of data predictive analytics can be used for. I now understand that the power of analytics lies in the ability to measure and compare factors together in so many ways that could be easily missed by a person looking at raw data or simple graphs. Things like multicollinearity could fly under the radar and never be considered in the final prediction decision. I was impressed by many of the examples talked about in this book and I enjoyed seeing that was I was learning could be applied to real world examples in almost the exact same way as we were learning them in class.

This book has taught me that predictive analytics is not only about viewing data and using simple models to predict the outcome. I learned a lot on how this can apply to computer science and saw a lot of possible applications of this technology that will help me in the future. I hope to go into cyber security someday and will be needing the methods and creative solutions that people have come up with using only predictive analytics. This book has also taught me a lot about how seemingly impossible tasks can be broken down in simple ways, and sometimes exact answers aren’t necessary when we can use predictive analytics to find an answer that is correct with ever increasing accuracy as the model is used more often.