CS35L ASSIGNMENT 10
REPORT

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In the article, "What AI can tell us about the U.S. Supreme Court" [2], written by three Ph.D students from Virginia Tech, the students describe a project in which they used a "data-driven framework that learns justices' judicial preferences and voting behavior" with the objective of better predicting the outcome of supreme court cases. Whereas previous and outmoded models used for predicting outcomes relied primarily on the justices' voting history and the news coverage at the time of the case, these students used a more in-depth approach that would ideally reveal trends that would not have been detected otherwise. Since the outcome of each case and the stance of the justices are all represented by what is called the opinion of the court, a document that is written by one of the justices, a lot of details pertaining to each case were being neglected in older models. These opinions presented the facts and points of each side of the case and provided a thorough and comprehensive perspective of the details of the case. Thus, the students were able to create a text-based model that analyzed the text and quantitatively assessed the written opinions. Using the opinion texts of the multitude of previous cases, they created a model that, together with the justices voting records, was able to identify justices' stances on particular issues and more importantly, which justices were more likely to "swing" on a particular issue, i.e., the swing justice would be the one who made the deciding vote. Applied to test data from supreme court cases from 2010 to 2014, the model saw 79.56% accuracy in identifying the outcome of a case. Moreover, the model was able to identify which of the justices were more likely to share perspectives and opinions.

Prior to reading the actual article, my reaction to the title alone was that it seemed a little far-fetched. After all, how could a process that was reserved completely to humans be successfully modeled? The judicial process of the supreme court is something that happens behind closed doors, and the fact that artificial intelligence could determine the outcome of a hearing that is supposed to be fair and objective seemed almost blasphemous. However, upon reading the article, I realized that it was not as ridiculous as it sounded. I thought that the students' decision to use text-based analysis was rather ingenious, seeing as this abundant source of data provides a lot of latent information in a case. In fact, this strategy of using text-based analysis to gain insight into issues that are not revealing to the human eye has become more prevalent as of recent years. In industry, companies have begun implementing similar methods to gauge public perception of the company in hopes of improving their methods of operation and boost profits. Consequently, people have also begun to use social media as a source of data. Twitter feeds, in particular, provide text-based data that can be used for a variety of analyses. For example, a few employees in the RD department at Opera Solutions wrote about incorporating sentiment (text-based) analysis and twitter volume to aid in predicting the outcome of US Primary elections and saw that while models of this nature are by no means foolproof, they can definitely serve as additions to models to acquire insight that would otherwise be neglected [3].

Clearly, sentiment/text-based analysis has opened up new opportunities for predictive modeling that had previously been closed off. Many older models focused on a strictly quantitative approach, ones that took in historical numerical data, but text-based analysis allows models to account for human sentiment and behavior, which are features that numbers may miss. In the case of the supreme court case article, we see that by incorporating the opinion texts into the features of the model, the students were able to get a sense of what was going on in the judicial process beyond the outcome of the case. They were to able spot behavioral trends and identify voting tendencies of the justices. Moving forward, sentiment analysis can save time and resources so that people no longer have to peruse text in hopes of finding unique perspectives. Instead, text-based models can take on this tedious task and find intuition that would have been otherwise been masked by the paragraphs and paragraphs of text.

On a more general note, advances in artificial intelligence and machine learning have allowed for large-scale predictions that show a surprising amount of promise. Although he did not use a model that was entirely similar to that of the Virginia Tech Ph.D. students, months before the 2008 presidential election, Nate Silver created a model that successfully "predicted the popular vote within one percentage point, predicted 49 of 50 states results correctly, and predicted all of the resolved Senate races correctly" [1, 4]. Feats like this exhibit how prominent these new methods are, and their rising accuracy and precision will open doors to predicting and planning events very far in the future.

REFERENCES

[1] S. CLIFFORD, *Finding fame with a prescient call for obama*, (2008).
http://www.nytimes.com/2008/11/10/business/media/10silver.html.

[2] HOSSAIN K. KRISHNAN S. ISLAM, R., *What ai can tell us about the u.s. supreme court*, (2016).
https://theconversation.com/what-ai-can-tell-us-about-the-u-s-supreme-court-55352.

[3] AGARWAL N. AGRAWAL A. GARG R. SHEI, L., *Predicting us primary elections with twitter*, 2012.
http://snap.stanford.edu/social2012/papers/shi.pdf.

[4] N. SILVER, *How the fivethirtyeight senate forecast model works*, (2014).
http://fivethirtyeight.com/features/how-the-fivethirtyeight-senate-forecast-model-works/.