An Interdisciplinary Approach to Sports Analytics in A University Setting

(Technical Paper)

Climate Change Policy Differences in Historically Red vs. Blue Voting States

(STS Paper)

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On my honor as a University Student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments

Introduction

"Information is the oil of the 21st century, and analytics is the combustion engine." (Mokaya, 1) This quote summarizes, in essence, what human beings have known for some time now— data is the world's most important resource, and the ways in which mankind uses it could shape its existence for many years to come. In fact, two of the biggest areas in which data is being used to make an impact are the very subject of this proposal— climate change and sports.

Climate change is one of the world's most pressing problems. Entire regions are at threat for being washed away or being uninhabitable by the year 2050, and impacts, while differing by region, are sure to touch every area of humanity (Plumer & Popovich 2017). However, climate change policy in various parts of the world, and various parts of the United States is dramatically different. Some areas and states are being very **proactive** in addressing this issue, while other states are taking more of a **reactive** approach (Plumer 2019). In this STS Research Paper, the distinction of climate change policy within traditionally Republican (red) and traditionally Democratic (blue) states will be examined and dissected to provide a further policy recommendation on an optimal way to deal with climate change moving forward. Furthermore, the use of data and predictive modeling within climate change will be covered in hopes of finding better algorithms and ways to create more accurate models to predict the future.

In sharp contrast, sports are not one of the world's most pressing problems, but rather is one of the biggest forces of unity and hope in many parts of the world. Even sports, however, has begun to incorporate data into its day-to-day operations. Many sports now use analytics, which encompasses data and modeling to drive outcomes (Steinberg). In this capstone, sports analytics will be examined in further detail, with hopes of bringing a center to UVA that specializes and

focuses on sports analytics. A thorough systems analysis will be conducted, and a recommendation on the best design will be presented to UVA Athletics.

Technical Topic and Capstone

Currently, the University of Virginia does not have a dedicated and collaborative effort to incorporate the use of data analytics in sports. While there are sports science initiatives by single professors and some select sports teams, the University community as a whole does not have any school wide directives or resources for students, athletes, and faculty to engage with (Lenox).

The capstone project will seek to address this issue by proposing multiple designs for a new sports performance and analytics center at UVA. This proposed center would seek to help UVA athletics win more games across all its sports, reduce athlete injury, and also serve as a powerful advantage in athlete recruiting (White).

The capstone team will incorporate a variety of systems engineering techniques, like systems analysis, data-driven modeling, and optimization, to work in conjunction across the academic, operational, and athletic divisions of the University to present this design. The team will start by interviewing coaches of all 27 varsity sports organizations, and then proceed to interview faculty and staff in all 12 of the undergraduate and graduate schools. Alongside these efforts, for those teams and faculty who express interest, preliminary modeling and visualization of currently existing data will be conducted using tools such as Excel, R, and Tableau.

The focus will then shift to outreach and funding. The research team will look to the community to identify potential sources of community engagements and partnerships, and also look to leverage the interest of possible donors by building detailed financial models and provided in-depth projections of revenues on the yield management side of the equation. The

team will also engage the use of experienced alumni football players like James Valeiras and Chris Tuttle, who are now working in sport analytics, to further inform their predictions and guide their hypotheses.

Finally, the research team will synthesize all this information and come up with a list of potential design options for the proposed center. Each design will include things like: location and space, cost, stakeholders, partnerships with academic departments, projected increase in revenue and interest, and any endorsements it has received from any important figures within the University community. These designs will first be presented to Professor William Scherer, followed by Deputy Athletics Director Ted White and Athletics Director Carla Williams. Lastly, the team hopes to culminate its work with a final presentation to President James E. Ryan and other various University stakeholders.

This project will be iterative in nature, and will involve many changes and modifications as the work is completed. In order to complete a true systems analysis, the team will start with an objectives tree and descriptive/normative scenarios, and move towards a final product step-by-step with feedback being incorporated at each step of the process. The team will also benchmark potential models against similar entities present at other schools like Syracuse and Michigan (Sports Analytics Major).

The hope of the team is that with its final deliverable, it can present a viable and easy-to-implement framework for UVA to implement the new athletics and performance center with relative ease—the definition of done will involve some sort of verbal acknowledgement and/or commitment and if all goes well, a donation to start the preliminary phases of the project.

STS Topic

Climate change has been an issue for the world since the Industrial Revolution, but has just recently started to come to light starting in the 1990's. The Kyoto Protocol was one of the first policies that the world agreed upon to mitigate this issue, but the United States did not ratify it. Since then, due to a very deep division of politics at the federal level, this issue has not been addressed adequately. As a result, many of the climate change policies in the United States today reside at the state level. This paper will focus on California and South Carolina, as they are on polar opposites on the climate policy spectrum. California, a traditionally Democratic voting state, has many policies at the statewide and local level limiting carbon emissions, littering, pollution, and also has safeguards to protect air and water, while South Carolina has not done much on this front (Karapin). It is also forecasted that climate change will impact both states differently. Both are projected to face rising sea levels, but California is expected to face greater amounts of droughts and wildfires, whereas South Carolina is expected to deal with stronger hurricanes (Kumar).

Some stakeholders in this scenario include the people of the United States, the states themselves, the federal governments, small businesses, political parties, and other countries. Physical artifacts include the actual tangible impacts of climate change while some non-physical impacts of climate change include legislation, projected impacts, and other future impacts which cannot be felt at the current moment (Stabilization Wedges). All of these unique entities will be examined further through the actor-network theory model.

To briefly summarize, actor-network theory is a "framework and systematic way to consider the infrastructure surrounding technological achievements (Cressman)." It was developed in Paris by French scholars Michel Callon, Bruno Latour, John Law, and others, and it

serves as a way to view the world. In actor-network theory, actors are "entities that perform and do things," and there is no difference between a human and non-human. However, all actors are referred to as "actants endowed with a character (Cressman)."

Furthermore, a network is a "group of unspecified relationships among entities of which the nature itself is undetermined," and consist of people and things. Lastly, intermediaries are the ways through which information is transmitted through the network to different actors. Actors communicate with other actors and to the network through intermediaries, and thus these figures are critical in the whole model.

This theory provides a framework to view and model the world, but there are some criticisms. First of all, some scholars, such as Langdon Winner, point out the fact that there are fundamental differences between humans and non-humans, and this introduces some issues to ANT as it stands lets any entity be an actor. Secondly, there have been arguments that ANT is amoral—however, there is a lot of debate on this subject (Rodger, Kate, and Moore). It seems to be a consensus that as long as the network is well-defined and described, it could still be moral and therefore this objection could be rendered invalid. Lastly, there are critiques from across the STS community that actor-network theory comes across as very descriptive, and does not provide adequate explanations for "social processes." This is because the very formulation of an actor and a network for any situation requires a lot of judgement on part of the writer and therefore may not be completely factually accurate (Actor-Network Theory (ANT)).

This research is important as it will provide a way to move forward and attack the climate crisis. The ANT framework will provide a way to understand all the moving parts of the puzzle with regards to passing climate policy, and therefore at the end of the paper, policy recommendations can be put in place to attack this problem in the most efficient way possible.

Research Question and Methods

The research question for this paper is "How are the impacts of climate change similar and different in red vs. blue voting US states, and what public policy in each set of states is being proposed to mitigate the impacts right now?"

This question will be answered using a variety of research methods, including policy analysis, discourse analysis, and network analysis.

Policy analysis will be applicable in analyzing different pieces of legislation and statutes, and trade-offs that exist amongst them. One such specific policy that will be analyzed with be the Global Warming Solutions Act (AB 32) in California (Karapin). This act, passed in 2006, created the California Air Resources Board, and called for "no-growth rates" (essentially 0) of Kyoto-banned greenhouse gases and a total greenhouse gas emission cut of 15% by 2020. In addition, other policies that will be examined will include California tariffs on non-renewable energy imports and rules on mandatory renewable energy source implementation by 2013. These policies in particular were chosen because they are some of the most progressive pieces of climate legislation in the country. They will be easy to benchmark against the relative inaction of South Carolina, and after that it will be possible to examine the trade-offs of these policies, as well as their impacts, in order to make a final policy recommendation.

Discourse analysis will be used to interpret the data and many conversations that exist around this topic. The comments and speeches pertinent to climate change delivered by California governor Gavin Newsom as well as South Carolina governor Henry McMaster will be examined to understand the underlying motivations for action and/or inaction (Guiney). Furthermore, US and state level climate change data will be utilized to prove trends and also to develop a further basis for the understanding of certain policy decisions in both states (National Centers for Environmental Information).

Finally, the network analysis will involve the ANT STS connection and loop the climate change issue in and try and flesh out connections that exist within it all. Connections between the federal and state governments of both states and the attitudes and viewpoints of various different stakeholders (ex: business owners, politicians, wealthy vs. poor, those who live on the coast, etc.) will be considered in order to tease out the existence of relationships within these connections and to prove the significance of those relationships with regards to climate policy.

Conclusion

This analysis in this prospectus will seek to achieve two primary goals: first, it will seek to provide tangible and actionable analysis into climate change policy in the United States, and second, it will seek to point out differences between traditionally red vs. traditionally blue voting states when it comes to climate policy, and it will make policy recommendations that will have the best chance of solving climate change in both kinds of states. By doing so, the analysis hopes to provide solutions to the gridlock that currently exists when trying to pass climate policy, and it also hopes to provide the most viable policy that could make a tangible climate change impact in a fast manner.

The technical capstone will seek to provide design recommendations and alternatives for a new sports performance and analytics center at the University of Virginia. The project will overcome hurdles such as busy schedules, cost constraints, and overall policy constraints at the university, and seek to present a recommendation that is timely, all-encompassing, and actionable to primary University stakeholders. It will be successful is an initial investment is considered and further action is taken to make sure its development is started and is going at a good pace. With its addition, it can hopefully attract higher caliber recruits and applicants, and work towards become a sports powerhouse school in the NCAA.

Both projects will be completed within the timeframe of the 2019-2020 academic year with milestone deliverables (prospectus, first plan, etc.) falling in October, December, and

February. There will also be further checkpoints and opportunities to check-in with the advisors of both projects as the work moves along.

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