

Machine Learning: Group 21 Project Proposal

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Background

As the world's population increases and as it moves towards a more booming industrial and technological period, people need to remember to take care of the planet. With our project, we will focus on showing which countries are moving towards more sustainable solutions and which countries are already implementing those practices. Using this information, we would also highlight the countries and areas that are not using sustainable practices and what they would need to do to implement these practices. Machine learning is useful when modeling human preferences, so we will leverage many cluster algorithms to see patterns of human energy consumption (Rolnick 2019) which will be discussed further within the methods section.

Problem Definition

Renewable energy solutions often require more investment and more technology to implement, so they may be harder to access depending on the country. We can project future growth and bring up potential ways to boost the change in areas that are developing by shining a light on areas that are already adopting renewable solutions which involves mapping and analyzing background factors and trends. Additionally, we want to analyze the sustainability laws and specifically the attitudes of consumers in these areas to see what variables impact their susceptibility to improving sustainability practices (Beiser-McGrath 2019).

Methods

The main machine learning technique that we see using in this project is clustering. We will cluster countries based on obvious factors like their access to electricity, their energy efficiency, and the percentage of renewable energy, as well as less obvious factors such as GDP and population ("The Energy Progress Report," n.d.). These variables can show trends and cluster countries based on how sustainable they are; we will use these clusters to further analyze which variables affect sustainability practices.

Results

The results of this project would involve clustered data to show hotspots in the world or in the United States where communities are more prone to sustainability practices. In addition to this, we will be able to map predicted future sustainability growth (in the US or in the world) based on a variety of factors such as income level and cost of sustainability.

Discussion

There are a couple of potential problems that we foresee occurring within our project. One of the main issues is settling on the breadth of our project. While we have found that finding data that is global has been easier, a lot more work and detail comes with analyzing this data on a global scale. On the other hand, we have not found any substantial data that is just limited to the United States, or even smaller regions, like individual states.

This project can be useful outside of the scope of this class because it can allow companies to expand sustainability measures to communities that are the most susceptible to them. They can also analyze the areas that are not as susceptible to see what changes can be made, and how the entire consumer attitude can shift to a more sustainable culture.

References (APA)

Beiser-McGrath, L. F., & Huber, R. A. (2018). Assessing the relative importance of psychological and demographic factors for predicting climate and environmental attitudes. *Climatic change*, 149(3-4), 335-347.

The Energy Progress Report . <https://trackingsdg7.esmap.org/>.

Rolnick, D., Donti, P. L., Kaack, L. H., Kochanski, K., Lacoste, A., Sankaran, K., ... & Luccioni, A. (2019). Tackling climate change with machine learning. *arXiv preprint arXiv:1906.05433*.