Climate Wins

Proposal strategy for predicting European weather variations using machine learning

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Overview

01

Objectives

02

Summary

03

Machine Learning Options

04

Thought Experiments

- ‘The Climate Time Capsule’
- ‘The Climate Symphony Orchestra’
- ‘The Safe Haven Map’

05

Recommendations

Objectives

The project objectives are to

- Identify weather patterns outside the regional norm in Europe.
- Determine if unusual weather patterns are increasing.
- Generate possibilities for future weather conditions over the next 25 to 50 years based on current trends.
- Determine the safest places for people to live in Europe over the next 25 to 50 years.

Summary

Advanced Weather Detection and Location Optimization

One:

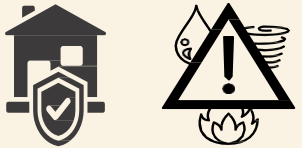
Look into weather pattern detection using GANs with audio classification and satellite imagery.

Two:

Explore the concept of live weather vehicle alerts, data collection, and retrieval based on weather conditions for safer travel.

Three:

Develop a model to determine optimal locations for new homes or vacation spots based on environmental factors.



Machine Learning Options

Random forest algorithm and GANs used with CNNs produced the highest accuracy and lowest loss predictions

Supervised learning and Unsupervised learning

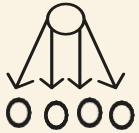
- Decision Tree
- Artificial Neural Networks (ANNs)
- Random forest
- Convolutional Neural Networks (CNNs)
- K-Nearest Neighbors (KNNs)
- Generative Adversarial Networks (GANs)

47%

46%

89%

64%



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Thought experiment one

‘The Climate Time Capsule’

What it is:

- Imagine creating a virtual time machine that shows us how climate change could alter our world over the next 25 to 50 years.
- It’s like using a complex puzzle-solving app that can predict the picture on the puzzle based on pieces from the past and present.
- **Other use cases:** Future preparedness, disaster planning, safe living, real estate investment, agriculture, business development.

Machine learning role:

- Neural Networks, Random Forest, GBM

Data beyond weather:

- Environmental policies, socioeconomic data, biodiversity records, open-source survey data on pleasant weather days.

Thought experiment two

‘The Climate Symphony Orchestra’

What it is:

- This is about listening to the Earth’s ‘music’—the sounds of rain, wind, and wildlife—to understand weather events.
- In this experiment, we use audio classification to “listen” to the Earth. A network of sensors placed around Europe collects audio data, capturing the sounds of the environment.
- **Other use cases:** live vehicle weather alerts, data retrieval for weather-related accident reports, weather-related vehicle adjustments

Machine learning role:

- Audio Classification Models (e.g., CNNs for sound).
- Image Classification Models (e.g., GANs for image).

Data beyond weather:

- Audio recordings, satellite imagery, correlation data between sounds, images, and weather events, anthropogenic noise data (removes human noise).

Thought experiment three

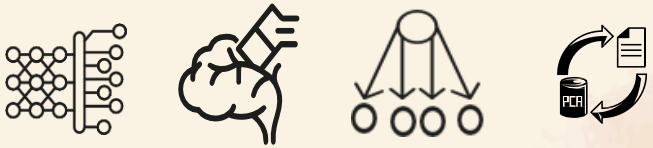
‘The Safe Haven Map’

What it is:

- A map that helps us find the safest places to be during extreme weather events, which are becoming more common due to climate change.
- It’s similar to a navigation app that doesn’t just give you the fastest route but also the safest one based on current and predicted conditions.
- **Other use cases:** safe living areas, vacationing, visiting, real estate investment, vehicle tech.

Machine learning role:

- Neural Networks, K-Means Clustering, PCA.



Data beyond weather:

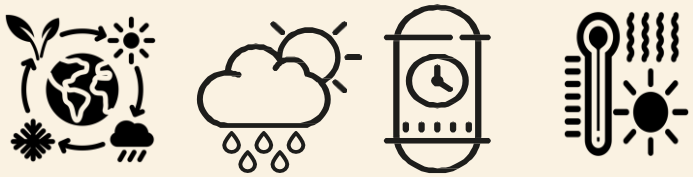
- Infrastructure resilience data, population density and migration patterns, resource distribution data, such as water and food supply chains.

Recommendations

What thought experiment has the most potential for answering ClimateWins objectives?

Most potential:

- ‘The Climate Time Capsule’



Why?

- Offers comprehensive simulation of long-term climate impact while also considering affect, resources, and equipment maintenance

Next steps:

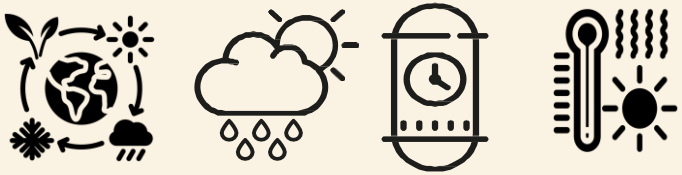
- Data collection, model refinement, stakeholder engagement, implementation planning.

Recommendations

How can ‘The Climate Time Capsule’ be accomplished?

How:

- Predictive analysis
- Pattern recognition
- Data clustering
- Time-series forecasting
- Data simulation (GANs)



Additional models include:

- **Neural Prophet**: For forecasting time-series data.
- **LSTM:** Long-short-term-memory model, time- series data.
- **Support Vector Machines (SVM):** For classification and regression of climate variables.
- **Decision Trees:** For clear, interpretable decision-making.
- **Recurrent Neural Networks (RNN):** For analyzing
- time-series data, such as weather time series

Thank you for your time!

This concludes my proposal strategy for ClimateWins.

Do you have any questions?

Please contact me below at:

Or visit :