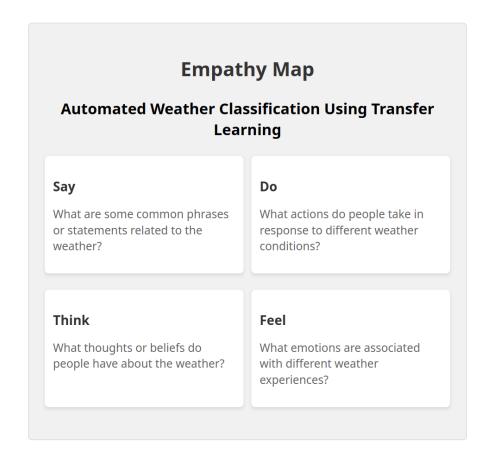# Automated Weather Classification Using Transfer Learning

Ideation Phase

Empathization

Weather classification is a crucial aspect of meteorology and weather forecasting, impacting numerous aspects of our daily lives. Accurate identification and understanding of different weather phenomena play a vital role in various applications, including environmental monitoring, weather forecasting, and assessing environmental quality. Moreover, different weather conditions have diverse effects on agriculture, making precise weather classification valuable for agricultural planning and optimization.

Empathy Map

Automated Weather Classification Using Transfer Learning

Say

What are some common phrases or statements related to the weather?

Do

What actions do people take in response to different weather conditions?

Think

What thoughts or beliefs do people have about the weather?

Feel

What emotions are associated with different weather experiences?

Meteorologists and weather forecasters rely on the ability to recognize and classify weather patterns to predict and communicate weather conditions effectively. However, manual classification of weather phenomena can be time-consuming and subjective, often leading to inconsistencies in interpretations. Therefore, there is a need for an automated weather classification system that can efficiently and accurately categorize weather images.

Discoveries

To address the challenges associated with weather classification, this project aims to leverage the power of deep learning techniques, particularly transfer learning. Transfer learning has proven to be a valuable approach in image analysis and classification tasks, enabling models to leverage knowledge learned from pre-trained models and apply it to new problems. By utilizing pre-trained models like Inception V3, VGG19, and Xception V3, the project aims to develop a high-performance weather classification system.

By collecting and preprocessing a diverse dataset of weather images, the project aims to ensure the model's robustness and ability to handle various weather conditions, lighting variations, and image quality discrepancies. The dataset will be properly annotated to enable supervised learning and accurate evaluation of the classification models.

The project also emphasizes real-time weather classification, enabling the system to process weather images from multiple sources, including weather monitoring stations, webcams, or user-submitted images. This real-time capability will provide timely weather information to meteorologists, weather forecasters, and the public.

Ultimately, the goal is to improve the accuracy and efficiency of weather classification, enabling meteorologists to make more precise predictions, support environmental monitoring initiatives, and aid in better agricultural planning.