

Weather Event CNNs Case Study Rubric

DS 4002 – Fall 2025: Joshua Yu

Due: TBD

General Description

Submit the link to a finalized GitHub repository to Canvas, containing an OUTPUT folder with model metrics screenshots and a final reflection document.

Individual Assignment

Why am I doing this?

This case study provides an opportunity to use and/or adopt data science skills in a full project. Specifically, it will utilize machine learning technologies with image data to generate relevant models. As you walk through this case study, you will walk through how to preprocess data, train models, and analyze through model metrics. Placing these steps in a real-world context allows you to understand a greater perceived effect of the technology used. These will culminate in a final reflection where you can present findings in a cohesive and professional manner.

What am I going to do?

In this case study, you will read through the hook document, supplemental resources, and rubric to explore the context and requirements of this case study. Then, you will use the given GitHub repository to access the case study materials to follow along with the case study and observe. You will be working with two CNNs – InceptionV3 and ResNet-50 – and using transfer learning to train these models specifically on your weather-event type dataset. Saving the best performing weights, you will test the models on the test set and use the metrics given to observe the performance of these two models. Your final output should be screenshot images of the printed metrics and graphs. Utilizing these metrics, you will explain the final results and conclusions of the case study in a final reflection document. Then, you will also write about one part of the case study that took your attention and reflect upon it.

Your final deliverables should include:

- A GitHub repository containing all materials used
 - OUTPUT folder with screenshots of the metrics for both CNNs
- A final one-page reflection document

How will I know I have Succeeded? You will meet expectations on this weather event case study when you follow the criteria in the rubric below.

Spec Category	Spec Details
Formatting	<ul style="list-style-type: none"> ● Repository – A GitHub repo (link submitted to Canvas) containing the original GitHub repository's contents and an added OUTPUT folder with model outputs <ul style="list-style-type: none"> ○ The files should be named with the model's name and type of output (e.g. ResNet50-Metrics, InceptionV3-ConfusionMatrix) ● Response Paper <ul style="list-style-type: none"> ○ Keep the document within 1 page ○ The outline of the document should be the following: <ul style="list-style-type: none"> ▪ Title ▪ Name, Date, Course ▪ Two Headers: <ul style="list-style-type: none"> ● Results Summary ● Case Study Reflection
GitHub Repository	<ul style="list-style-type: none"> ● OUTPUT FOLDER <ul style="list-style-type: none"> ○ Contains two screenshots of the given metrics for each model printed by the script ○ Contains two images of the confusion matrix produced by the given scripts
Written Response	<p>Discuss the findings and reflections of this case study in a one-page document with the following sections:</p> <ol style="list-style-type: none"> 1) Results Summary – A paragraph detailing the results of the case study <ol style="list-style-type: none"> a. Provide context to the models used b. Summarize the performance of the models using metrics produced by the case study 2) Case Study Reflection – Detail one personal lessons and takeaway <ol style="list-style-type: none"> a. Take one element of the case study (e.g. preprocessing the image data, models, transfer learning process) that stood out to you and elaborate on your experience working through it