**Using U-Net Convolutional Neural Network Model to Classify Deforestation in the Amazon Rainforest**

Case Study Hook Document

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## Project Motivation

The Amazon Rainforest, an area as large as the United Kingdom, includes 30% of the planet's biodiversity. This is a location of constant research, fueling the discovery of new plants and animal species. The Amazon, however, is also at risk of large-scale deforestation, losing around 54.2 million hectares–the equivalent of the size of France–in 20 years. Not only does this lead to loss of biodiversity, but this also is indicative of climate stability and water supply. Deforestation due to forest fires also increases greenhouse gas emissions significantly, affecting climate change. Land use can also threaten the Amazon, as area is allocated to livestock farming, mining, the building of road infrastructure, and mining.

## Deliverable:

As a data scientist, you are able to aid in and inform efforts to prevent deforestation. This involves tracking and quantifying loss through satellite TIFF image files. Being able to track loss is crucial for future loss prediction, as well as mitigation, targeting specific areas in need of environmental protection. This process also aids in identifying causes of deforestation, informing environmental policy and guiding conservation efforts by non-governmental organizations (NGOs) such as Amazon Conservation Association, Amazon Watch, and the World Wildlife Fund. Your task is to train an image classification model (CNN U-Net) to identify areas of forested and deforested regions of the Amazon Rainforest using TIFF satellite image data from the National Institute of Allergy and Infectious Diseases (NIAID) Data Ecosystem Discovery Portal. With this deliverable, you will be able to provide NGOs with a platform to aid in their efforts to track and reduce deforestation in the Amazon Rainforest. A well trained model could also be applied to other forested areas also at risk of deforestation, helping to maintain biodiversity in other regions of our planet. .

Case Study Github repo: https://github.com/marisagua/CaseStudy