Review: GeoAI for Disaster Mitigation: Fire Severity Prediction Models using Sentinel-2 and ANN Regression

Student ID: 24141255
Student Name: Showrin Rahman
Course Code: CSE424
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1. Summary of the Paper

1.1 Motivation

This paper analyzes the patterns of pre-wildfire vegetation conditions to forecast the severity of wildfires in Indonesia.

1.2 Contribution

It uses powerful artificial neural network (ANN) models to find patterns in Sentinel-2 remote sensing data, predicting wildfire severity by identifying nonlinear correlations between the vegetation conditions prior to a fire.

1.3 Methodology

In order to predict the intensity of the fire, this study uses ANN regression with configurations of up to six hidden layers . The model is trained dataset of more than 100,000 images and depends on factors like moisture, senescence, and vegetation greenness. They devided the dataset in training and validation sets and used matrics like R^2, MAPE, and RMSE to evaluate the model's performance.

1.4 Conclusion

Using powerful model like ANN (artificial neural network) With indices like Red-Edge Chlorophyll Index (IRECI) can provide reliable result to predict wildfire. .

2. Critiques or Limitations

The model is implemented in a really restricted ecological region which makes it really less robust
The implementation this model can be really expensive duo to its need for high computing resources which can be tough for many restricted resourced regions .
This model high dependency on accuracy on sentinel 2 data is a threat as it can be effected by atmospheric conditions and technical problems.

3. Synthesis

If ANN models are combined with other disaster management tools definitely it can be used with real time data for predicting wildfire in more robust way
The model can be used and evaluated for different geological location in order to make it more dynamic.