Improving Flood Detection on SAR images using State-of-the-Art Computer Vision Algorithms

Floods are a frequent and impactful disaster that occur throughout the world, causing significant damage to infrastructure and loss of life. Rapid and accurate detection of floods can help to mitigate their impact, enabling emergency services to respond quickly and effectively. Computer vision algorithms have shown promising results in detecting floods from satellite images, and the recent availability of high-resolution Synthetic Aperture Radar (SAR) data provides a new opportunity to develop accurate flood detection algorithms.

This project aims to apply state-of-the-art computer vision algorithms for flood detection and compare their performance. The project will focus on the flood event detection contest organized by the NASA Interagency Implementation and Advanced Concepts Team in collaboration with the IEEE GRSS Earth Science Informatics Technical Committee [1]. The contest involves using supervised learning to identify flood pixels in SAR images. Participants are required to submit binary classification maps, and performance is evaluated using the intersection over union (IOU) score.

The project will begin by implementing state-of-the-art deep learning algorithms for flood detection. The performance of these algorithms will be compared, and areas for improvement identified. Novel ideas for improving the state-of-the-art will be proposed and implemented, such

as incorporating temporal information into the flood detection algorithms to enable more accurate detection of dynamic flood events.

The project will be conducted using publicly available SAR datasets, and participants will have access to computing resources and software tools for implementing and evaluating their algorithms. The project is suitable for students with a background in computer vision, machine learning, or related fields, who are interested in applying state-of-the-art algorithms to real-world problems. By participating in the project, students will have the opportunity to contribute to the development of accurate flood detection algorithms, which have the potential to make a significant impact in disaster response efforts.

[1] ETCI 2021 Competition on Flood Detection. https://nasa-impact.github.io/etci2021/