IAF EARTH OBSERVATION SYMPOSIUM (B1)
Interactive Presentations - IAF EARTH OBSERVATION SYMPOSIUM (IP)

Author: Mr. Sergio Sosa Callupe
Universidad Nacional de Ingeniería (Lima, Perù), Peru, sergio.sosa.c@uni.pe

Mr. Lucas Nicolas Taipe Ramos
Universidad Nacional de Ingenieria, Peru, Peru, ltaiper@uni.pe
Mr. Jesus Antonio Tapia Gallardo
Universidad Nacional de Ingenieria, Peru, Peru, jtapiag@uni.pe
Mr. Omar Enrique Blas Morales
Universidad Nacional de Ingenieria, Peru, Peru, oblasm@ieee.org
Mr. Juan Salvador Palacios Bett
Universidad Nacional de Ingeniería (Lima, Perù), Peru, juan.palacios.b@uni.pe
Mr. Nilton Cesar Rojas Vales
Universidad Nacional de Ingeniería (Lima, Perù), Peru, nrojasv@uni.pe
Mr. Jhon Rocha Calderon
Universidad Nacional de Ingeniería (Lima, Perù), Peru, jrochac@uni.pe
Ms. Medaly Eulogio Saenz
Universidad Nacional de Ingenieria, Peru, Peru, medaly.eulogio.s@uni.pe

DEVELOPMENT OF AN ALGORITHM BASED ON DEEP LEARNING FOR THE CLASSIFICATION OF OCEANIC GEOPHYSICAL PHENOMENA.

Abstract

The main objectives of the Sentinel-1 mission are the observation of Land, Marine and Atmospheric Monitoring for emergency management, security and climate change. One of the many phenomena that the European satellite can detect are geophysical phenomena, which include oceanic and meteorological features, where the main area of study is the open ocean. The development of new detection methods for these events is essential, as most of the events have an important role in the climate system. For this reason, we propose a new convolutional neural network architecture, GeophysicalNet, with improved feature extraction to identify each of the ten classes of geophysical phenomena present in the TenGeoP-SARwv database. The GeophysicalNet neural network is composed of non-sequential layers, residual layers, parallel layers and fully connected output layers with dropout. The neural network was trained with a fraction of the TenGeoP-SARwv database and using data augmentation; we also trained several classifiers based on standard We obtained the performance metrics of the GeophysicalNet neural network and traditional classifier models. The GeophysicalNet neural network proved to have higher accuracy in different performance metrics when compared to other open-source neural network architectures. The proposed model can detect anomalies present in the ocean, with this open access information we have a better control of maritime spaces and thus avoid environmental damage or natural disasters.