Mucilage detection from multi-band, multi-resolution, multi-satellite data

Hermes

Murat Dede

Supervisor

DR. S. ESEN YÜKSEL

Electrical and Electronics Engineering, Hacettepe University

Introduction

❖ Mucilage, also called as sea snot or sea saliva, is a collection of mucus-like organic matter found in the sea. It is a sticky substance produced by microorganisms in the sea. Although not harmful in the beginning, when mucilage increases over time, it covers the sea creatures and forms thick layers in the sea. Its existence and long duration change the oxygen balance in the seas, reduce biodiversity, fisheries, and tourism. Today, mucilage is a common problem of the world and increases due to reasons such as sea temperature, increased pollution rate, sudden increase of microorganisms and stagnation of the sea. It has been seen from time to time in our region and precautions must be taken before it reaches serious dimensions so as not to harm its living life.

❖ Therefore, remote sensing is the most appropriate solution to the problem. This artificial intelligence and deep learning supported software will be the solution for the early detection of mucilage by using data obtained from multispectral, hyperspectral and SAR satellites, for the purpose of examining and tracking its spread later.
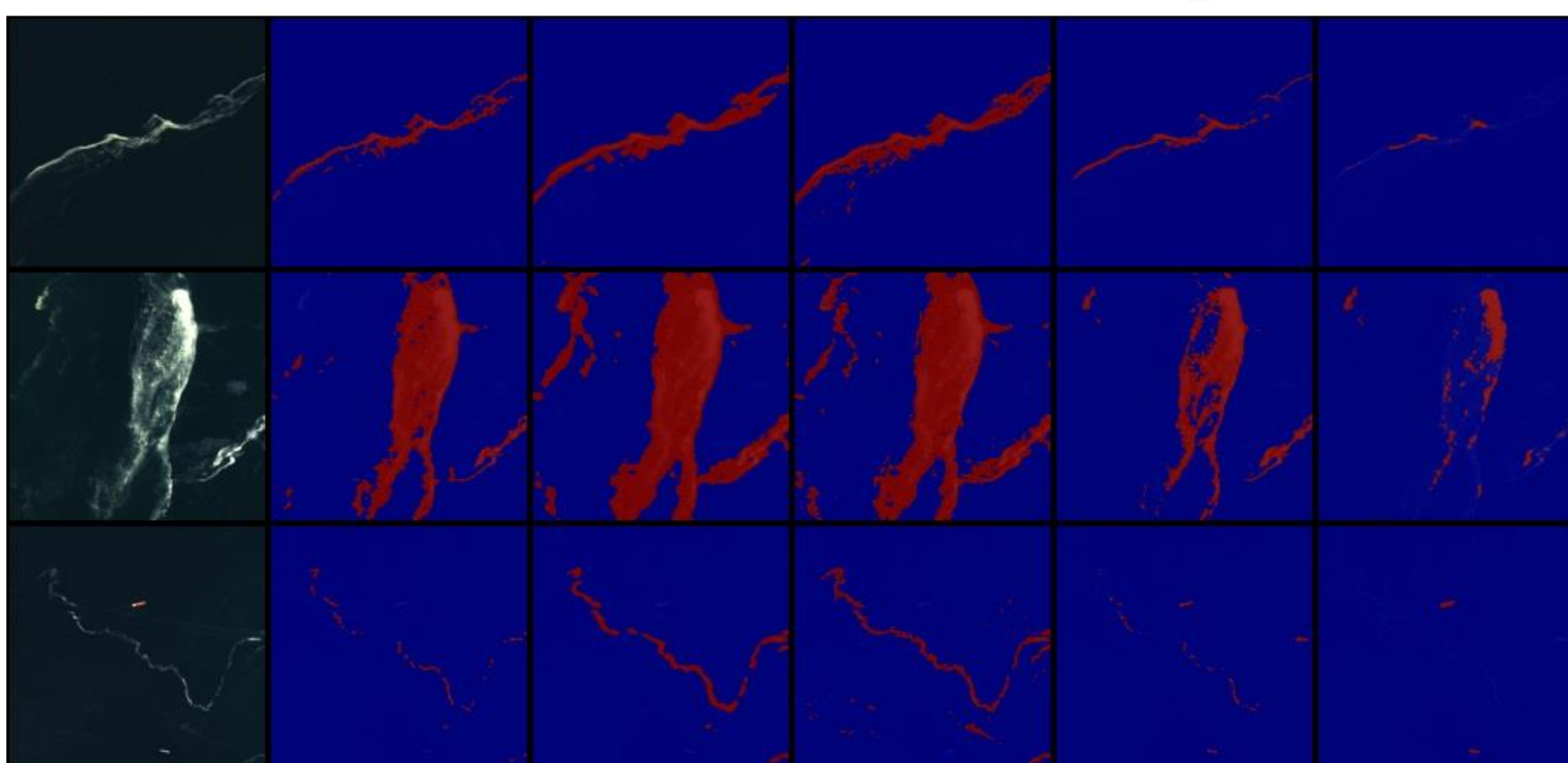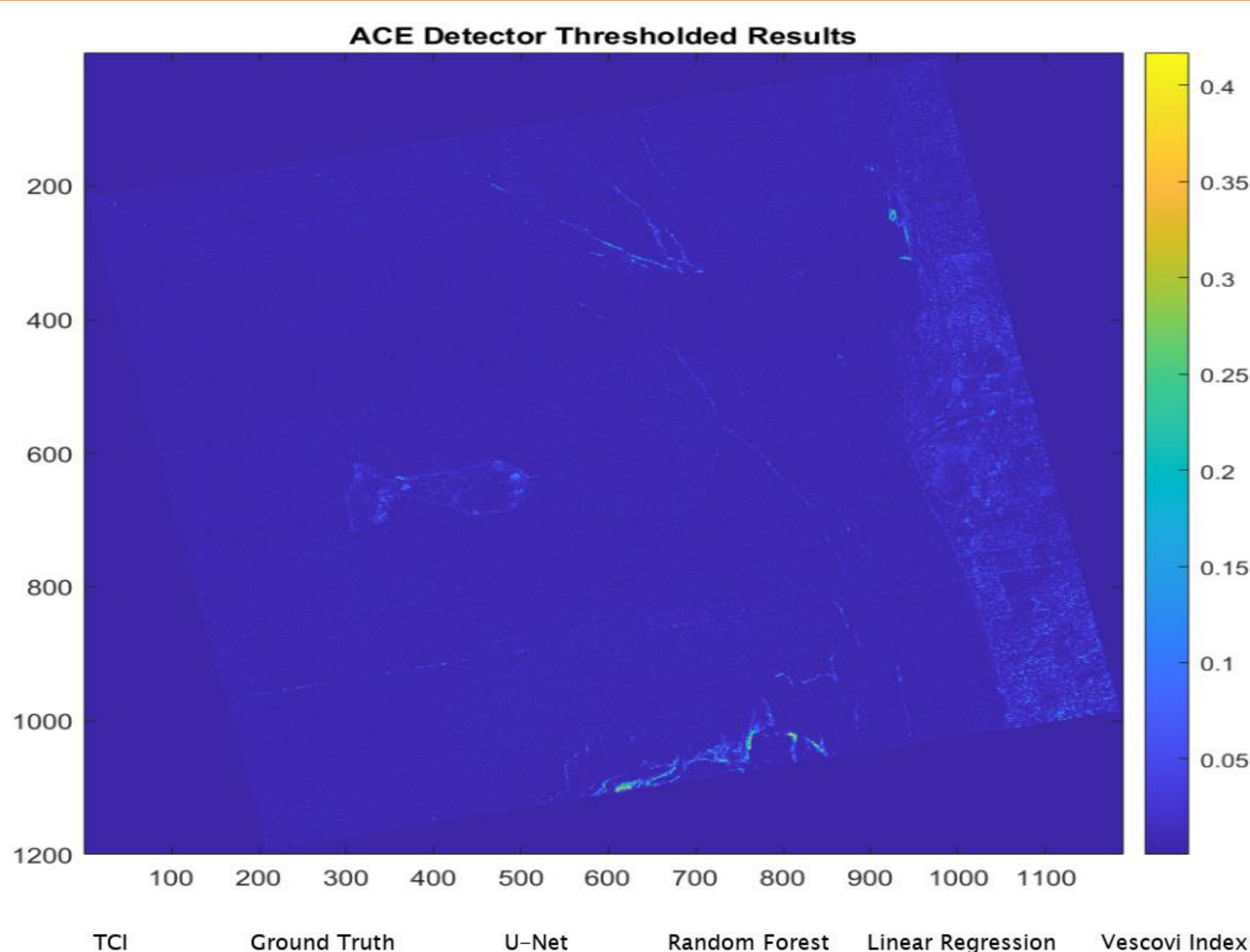
Application Areas
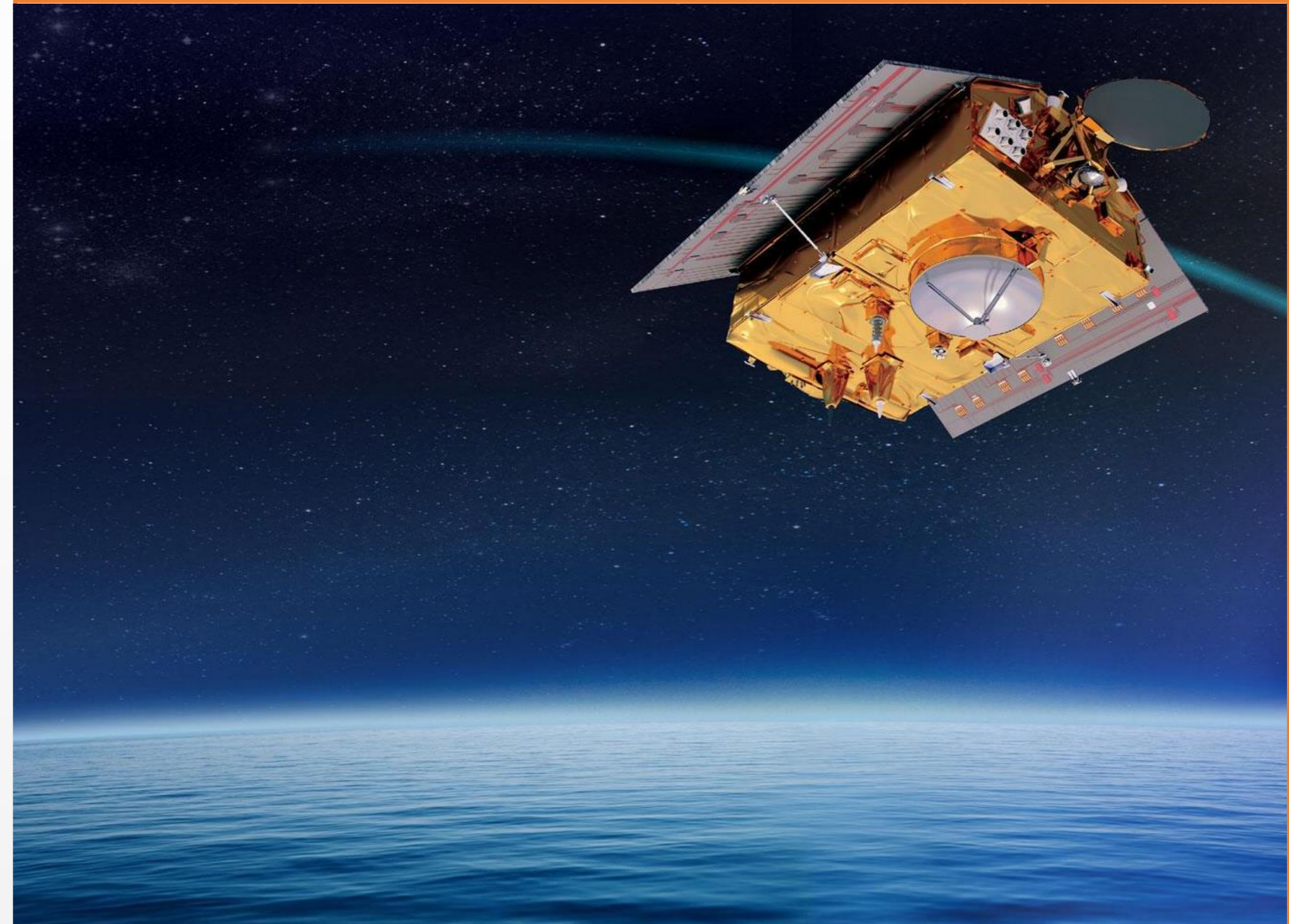
❖ This software can be used on sea and oceans where satellites are monitoring and on less cloudy days.
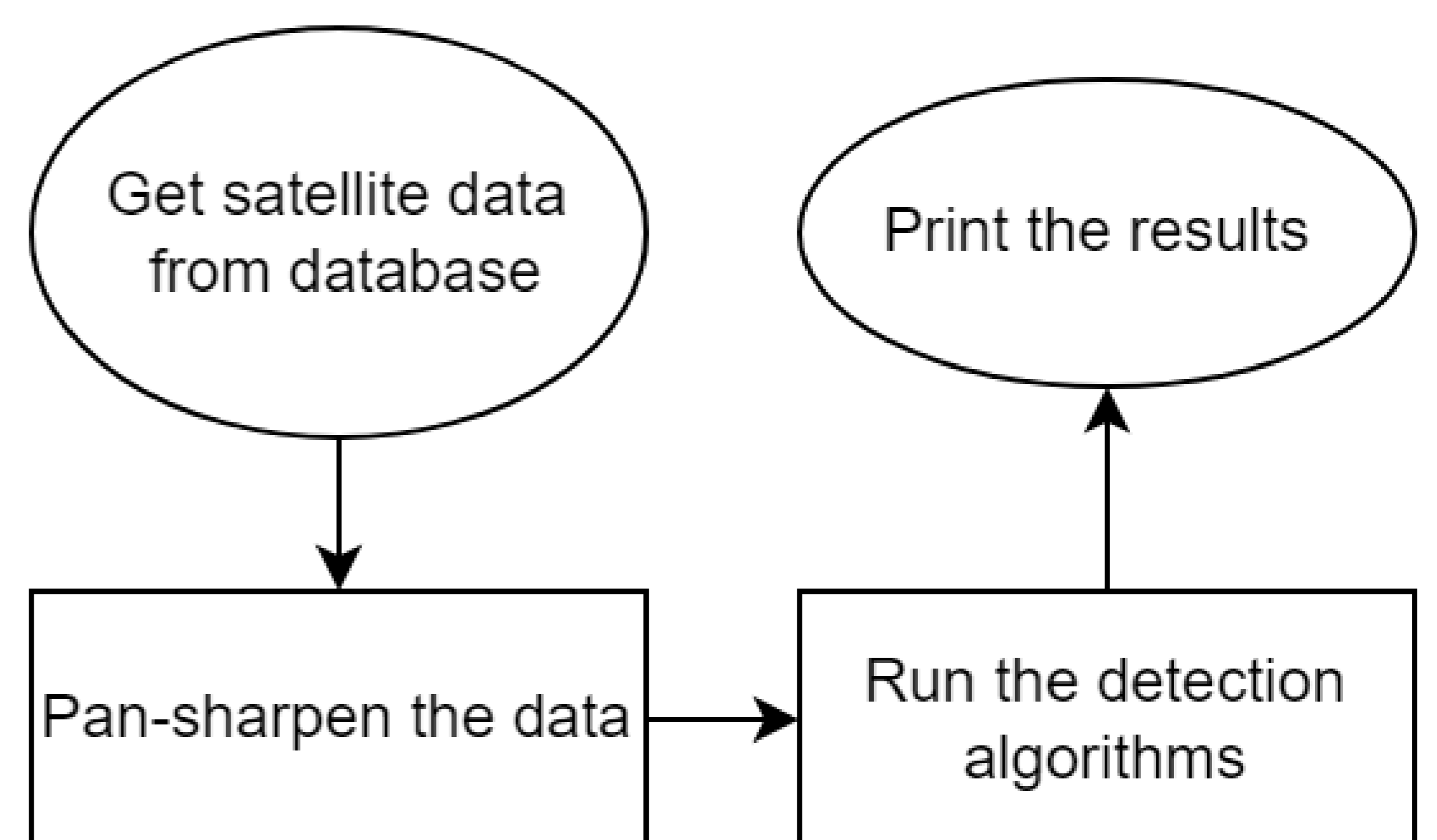
Specifications and Design Requirements

❖ Matlab and Python codes are available.

Results and Discussion

ACE Detector Thresholded Results

TCI   Ground Truth   U–Net   Random Forest   Linear Regression   Vescovi Index

Solution Methodology

❖ Matlab and Python is used for training neural networks.

❖ Random Forest, U-Net, Linear Regression, Vescovi Index, ACE, ssACE, SID, SAM, MF and ATGP are used.

❖ For pan-sharpening ArcGIS python library and hyperspectral toolbox for Matlab are used.

Get satellite data from database → Pan-sharpen the data → Run the detection algorithms → Print the results

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