RES-NRSC-2022-011

Name of ISRO Centre/Unit

National Remote Sensing Centre, Hyderabad

Title of the research proposal

Development of deep learning framework for auto quality certification of all IRS optical Satellite Images.

Name of Co PI from ISRO Centre/Unit

Shri. K. S. Soma Shekar

Contact Address of Co PI and e-mail id

National Remote Sensing Centre, Hyderabad
e-mail: sekhar_k@nrsc.gov.in

Area of Research

Satellite Image Processing, Pattern Recognition, Machine Learning, Deep Learning

Summary of the proposed research and expected deliverables

Multi mission quality evaluation software package with the capability of handling the highly voluminous, various data formats and different data types of Resourcesat and Cartosat Missions and similar Optical missions satellites data needed for validating and qualifying the products generated in automatic production chain. This will facilitates the generated products to be in harmony wrt to radiometry and geometry across all optical missions. To meet this a new indigenous software is proposed to be developed using AI/ML and machine learning techniques with embedded capabilities for adding future optical missions and SAR missions, to evaluate product quality parameters. Both in spatial and spectral fronts like spatial inaccuracy, noise patterns, artifacts, saturations, streaking, Repeated coupling image(Ghost patterns), Band to band miss- registrations in case of multispectral data and any other specific sensor related issues which are known, the database of which is available with us and expected occasionally.

Scope of the Work:

- It is essentially required to design and develop highly accurate optical data product quality evaluation software that uses deep learning techniques to automatically certify the IRS products for the parameters of geometric accuracy using reference image, Ground Control Point Library (GCPL) using pattern recognition/better approaches by AI/ML techniques, stagger correction evaluation, side lap /overlap evaluation, band to band registration (BBR) evaluation and radiometric quality evaluation including noise ,detecting the artifacts.

Deliverables:

- State of art computing architecture/Optimal computing software system for processing

certifying and processing of large volume RS data products for systematic and non-systematic errors.