

TECNOLOGIE INFORMATICHE

Osservatorio astronomico di Cagliari

SRT RFI MONITORING

COLLECT DATA

The spectra of the signal around SRT between 200 MHz and 6GHz.

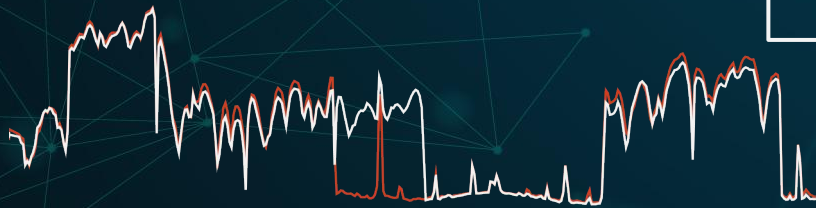


TRAIN MODEL

A ML model is trained to recognize the variations with respect to the signal of the previous days

REAL TIME INFERENCE

The trained model, monitors the situation daily and reports anomalies

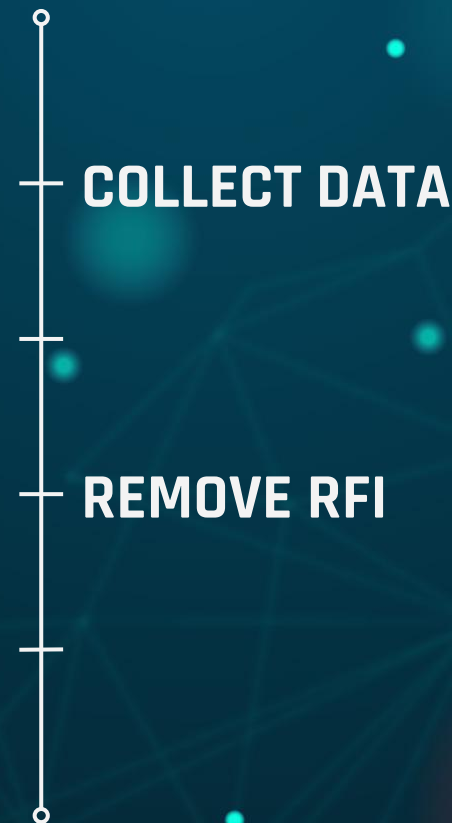


QUICK-LOOK SPEED UP

Speed up the quick look pipeline, using machine learning, quickly identifying interference peaks and explore the possibility to work directly in the time domain.

PRE-PROCESS

POST-PROCESS



DEEP LEARNING APPLICATIONS



RFI MASKING

Flag RFI pixels inside spectrograms using Convolutional neural networks



PAF SYNTHESIS

Generate antenna element weights, from desired beam pattern images, using CNNs



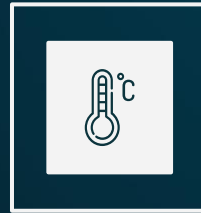
SPACE DEBRIS DETECTION

Space debris streak detection in staring mode images, using detection models (e.g. YOLO v5)

PREDICTIVE MAINTENANCE

COLD HEADS MONITORING

Monitor the trend of the currents in the cooling motor of the cold heads



Historical data tagged

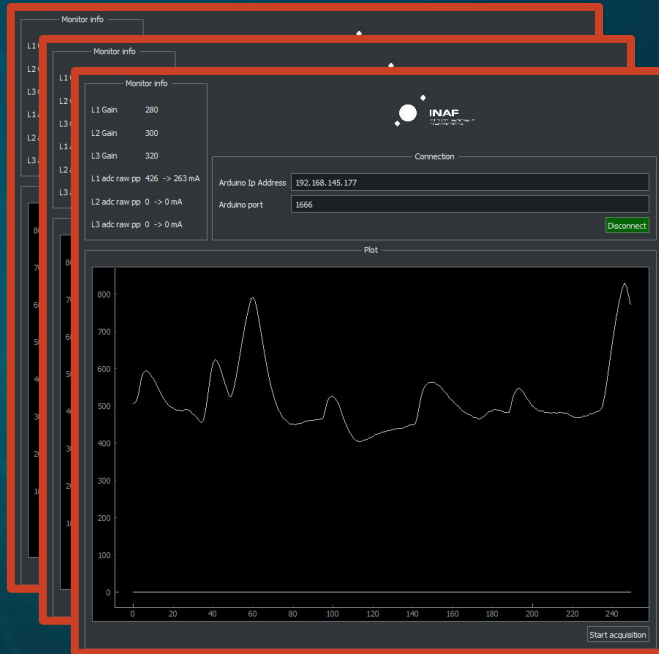
SUPERVISED



UNSUPERVISED

Clustering

MONITORING AND CONTROL SOFTWARE



Development of the control software for the new devices to be installed in the antenna and interfacing with the DISCOS team for integration with the SRT management software.

THANKS!

Do you have any questions?

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*Ministero dell'Istruzione,
dell'Università e della Ricerca*



PON
RICERCA
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2014 - 2020



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