SMART INDIA HACKATHON 2019

PRESENTATION 3.O

TEAM FORGERS

SMART INDIA HACKATHON 2019

GOALS ACHIEVED

1.PREDICTION OF SATELLITE EPHEMERIS USING TIME SERIES FORECASTING

2.INTERACTIVE WEB APPLICATION

3.NO CONSTRAINTS ON PREDICTION

4.VISUALIZATION ORBITAL SIMULATION (NO LIMIT ON TIMESTEPS)

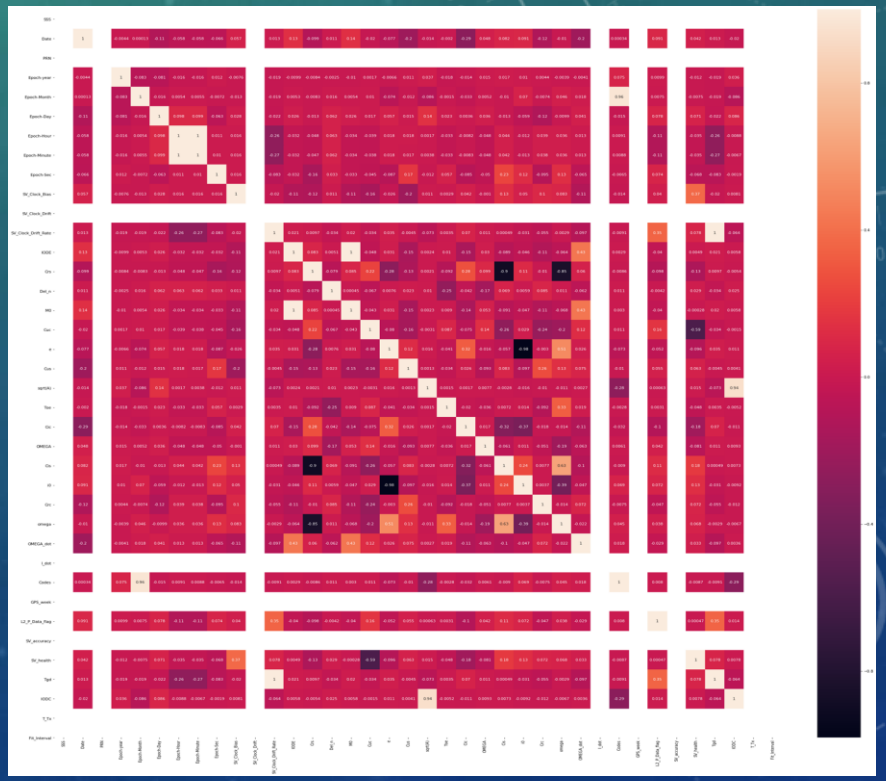
5.CALCULATION OF ERROR USING DIFFERENCE IN X,Y,Z 3D COORDINATES IN ECEF FRAME

6.GRAPHICAL REPRESENTATION OF ALL THE PREDICTIONS

7.UTILTY OF ADDING .N FILES BY OPERATOR

8.RUNTIME SCRAPING OF ML CONTENT FROM .N

INSIGHTS DRAWN FROM DATA SET:



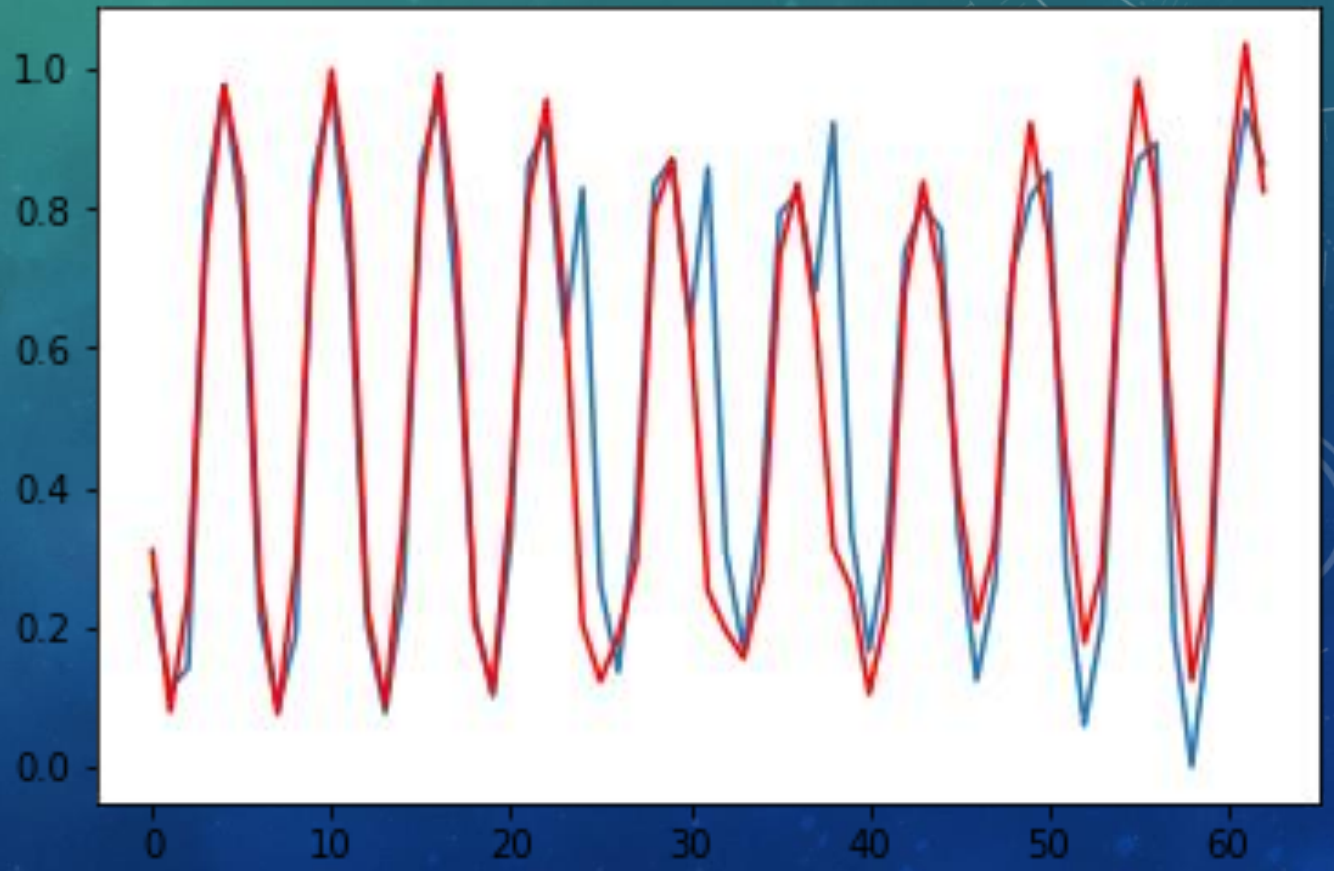
1.THE 6 KEPELRIAN COORDINATES ARE NOT COMPLETELY INDEPENDENT

- A strong correlation exists between cis ,crs
- And also i0 and E

INSIGHTS DRAWN FROM DATA SET:

1.THE PREDICTION WE MAKE IS NOT FROM REAL DATA IT IS FROM EXPECTED DATA WHICH IS PRONE TO IRREGULARITIES

BEST PART :OUR PREDICTION IS CORRECTING THE EXPECTED AS WELL



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USER INTERFACE1:

1. RECR_ON_DATE
2. RECR_OFF_DATE
3. REQUIRED_DATE
4. SATELLITE NUMBER(V1.0)
5. UPLOAD MULTIPLE .N FILES

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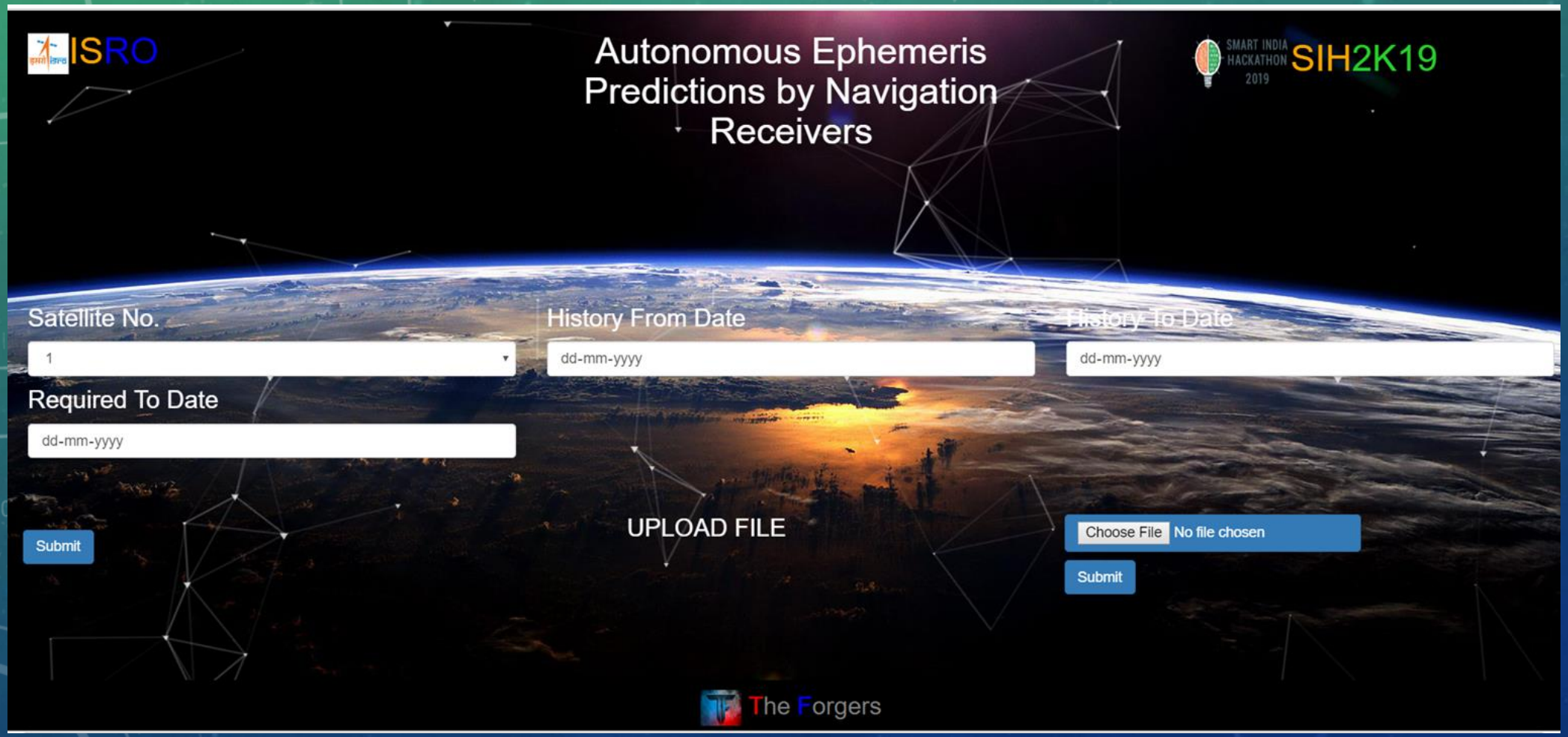

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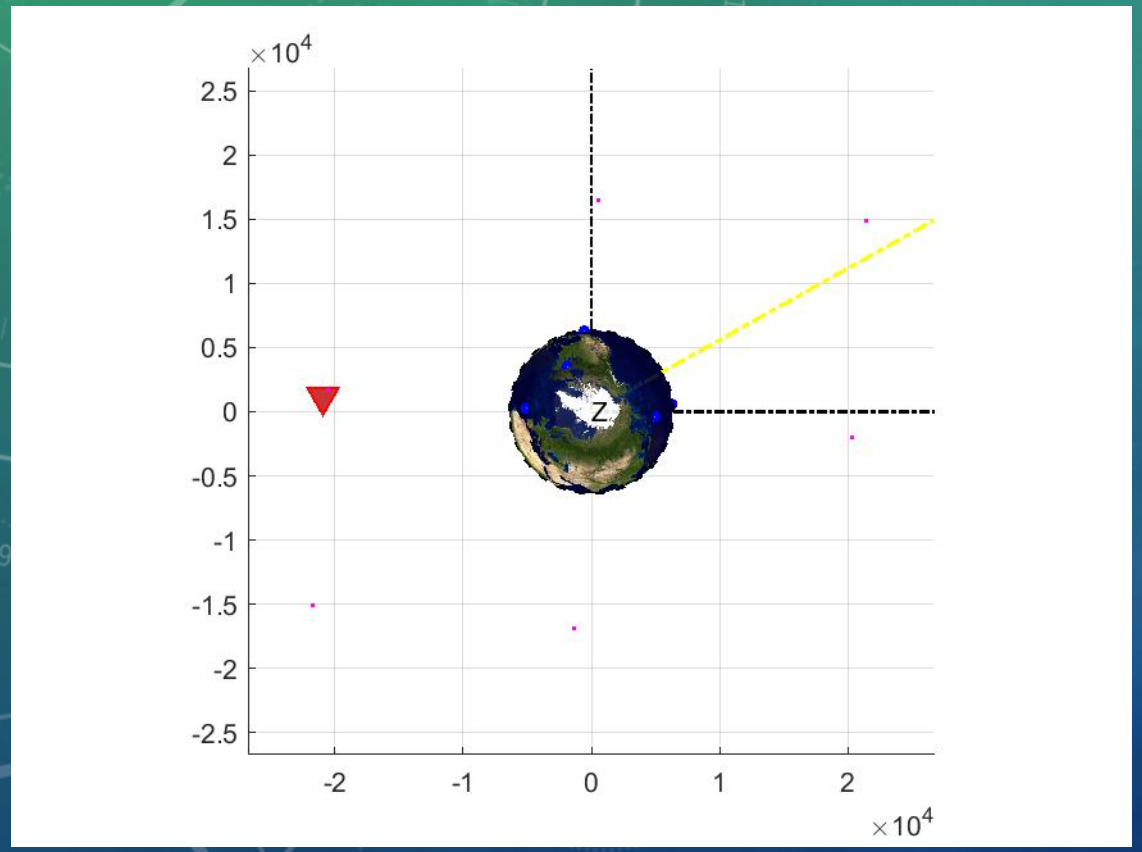
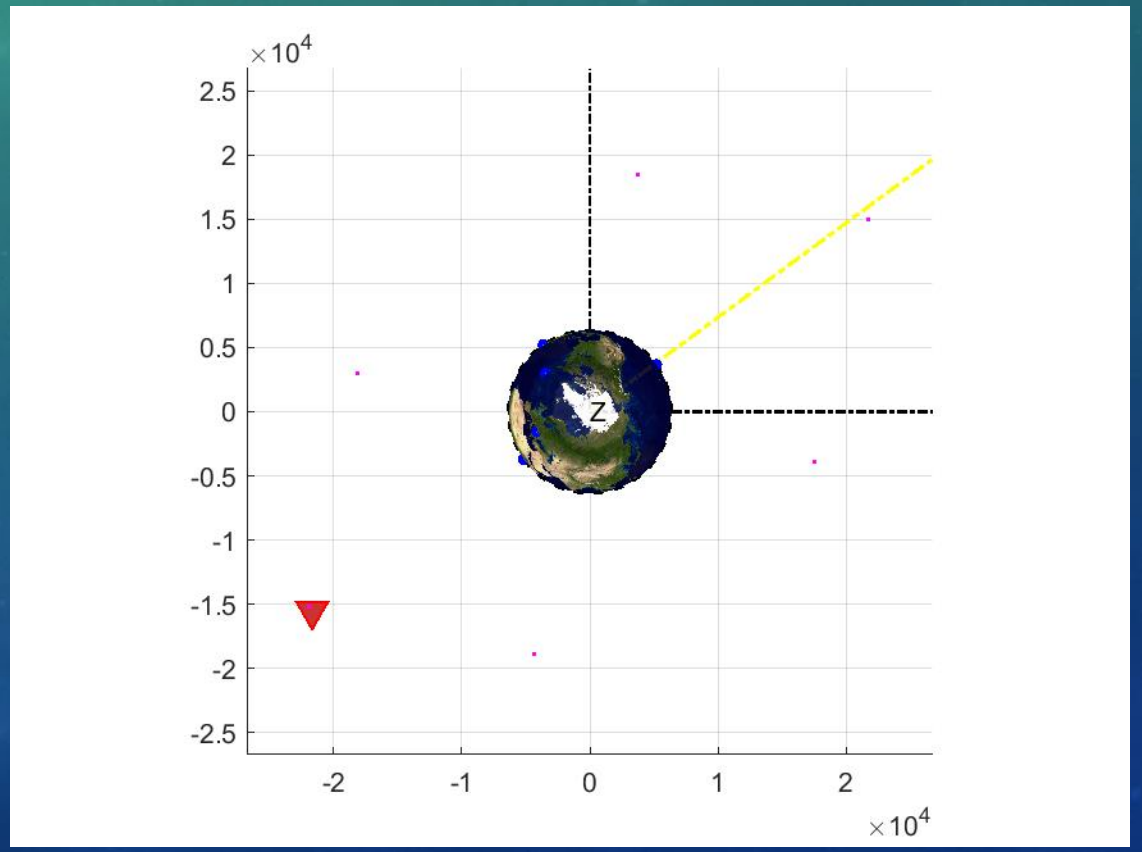
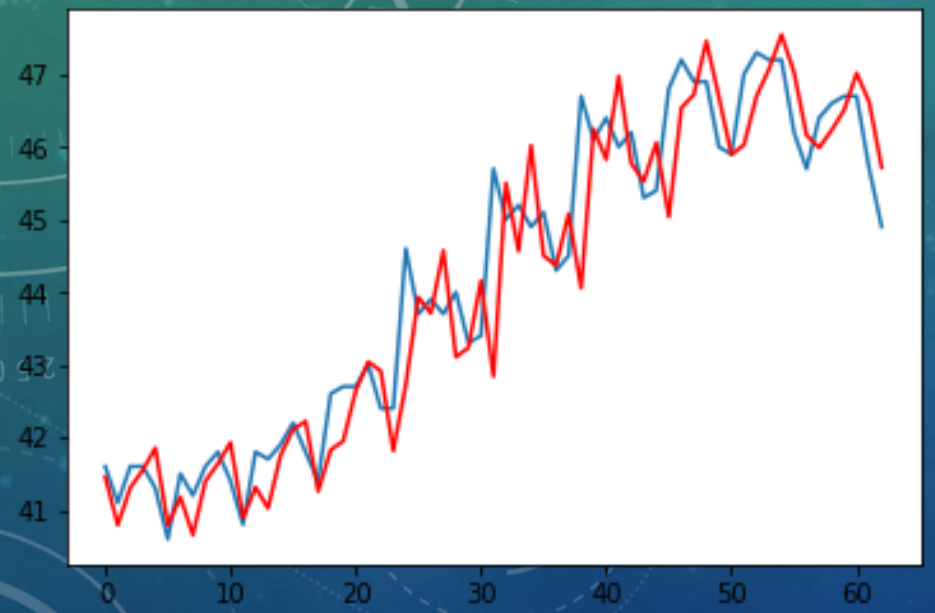
ECI FRAME



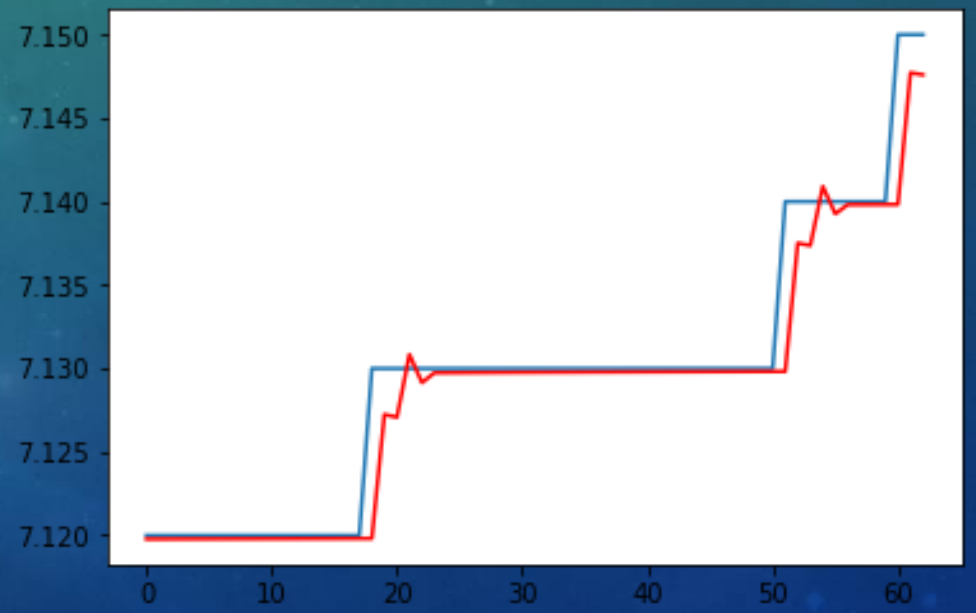


USER INTERFACE2:

INTERACTIVE GRAPHS IN RUNTIME SIGNIFYING ERROR RATES



DEL_N



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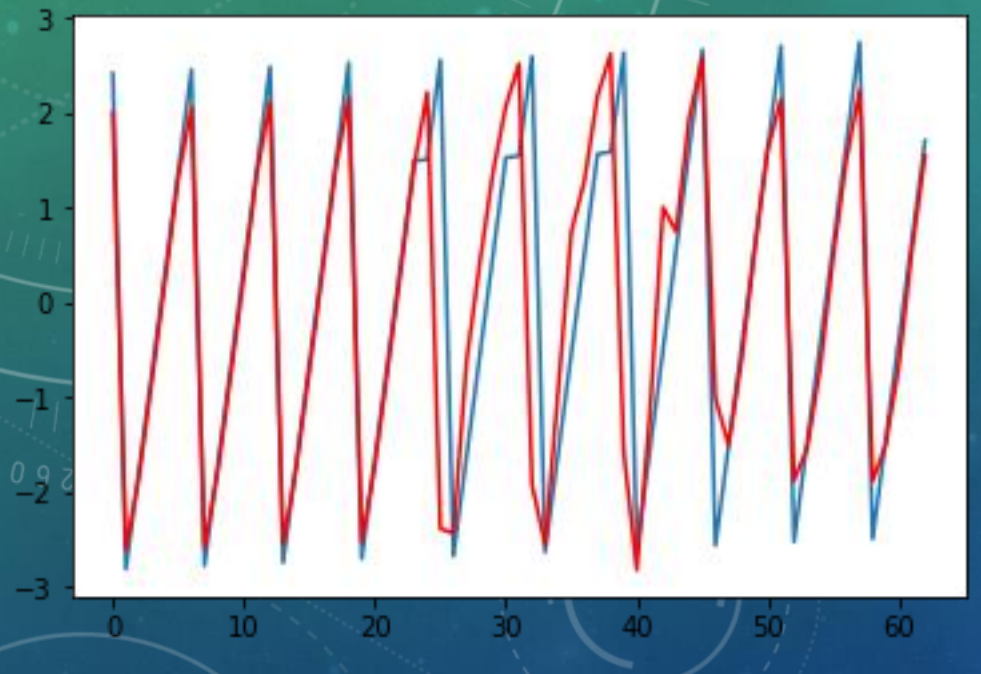
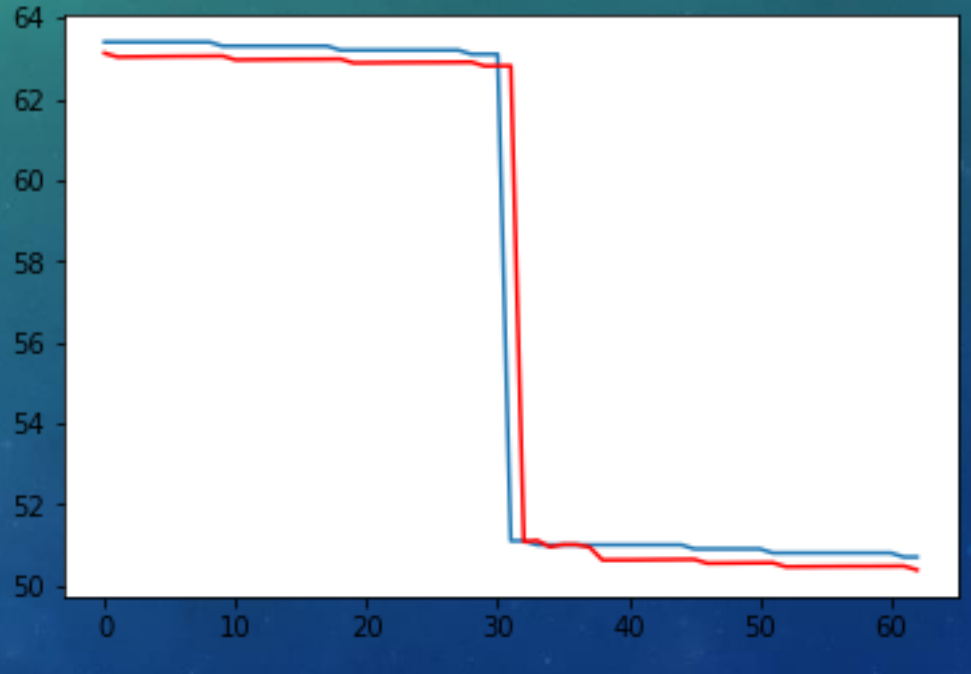
USER INTERFACE2:

INTERACTIVE GRAPHS IN RUNTIME SIGNIFYING ERROR RATES



Mean anamoly

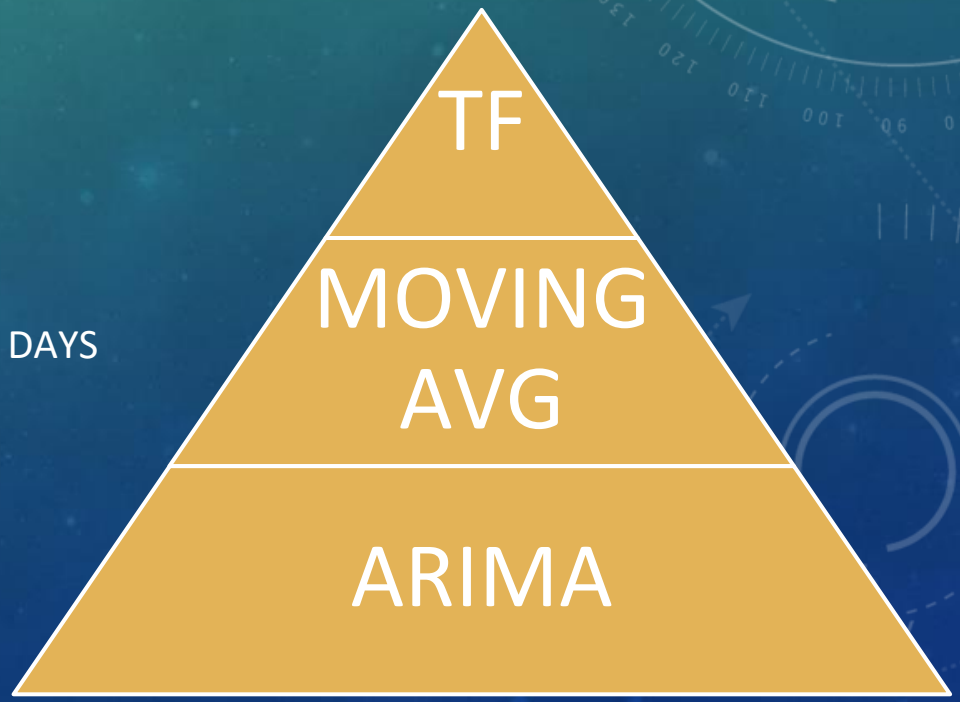


RAAN

OUR BACKEND STRENGTH:

- 1.CUMULATING VARIOUS MACHINE LEARNING MODELS AND THEREBY INCREASING ACCURACIES
- MODELS INTEGRATED:
  - AUTO REGRESSIVE INTEGRATED MOVING AVERAGE MODEL(ARIMA)
  - MOVING AVERAGE MODEL
- ADDITIONAL ADVANTAGES GAINED:
  - ABILITY TO PREDICT WITH HISTORY DATA BEING GIVEN AS LESS AS 1,2, DAYS

  (WHICH NO OTHER ML ALGOS USUALLY PROVIDE)



PROBLEMS FACED AND ADDRESSED:

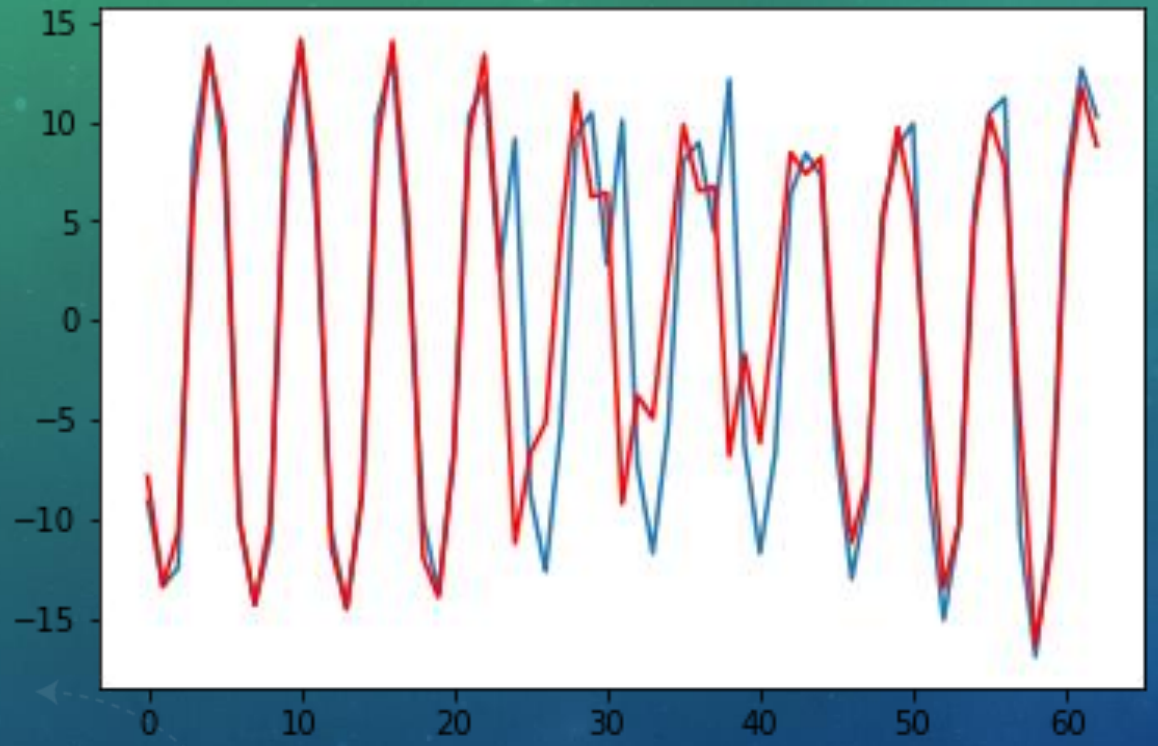
- 1.INCREASED ERROR AT PEAKS(I.E…IRREGULARITIES)
  - NOISY DATA SMOOTHING
  - USING DEPENDENCIES AMONG EPHEMERIS TO OVERCOME THIS

2. ACCURACY DEPRECIATION DUE TO ERRORS LIKE

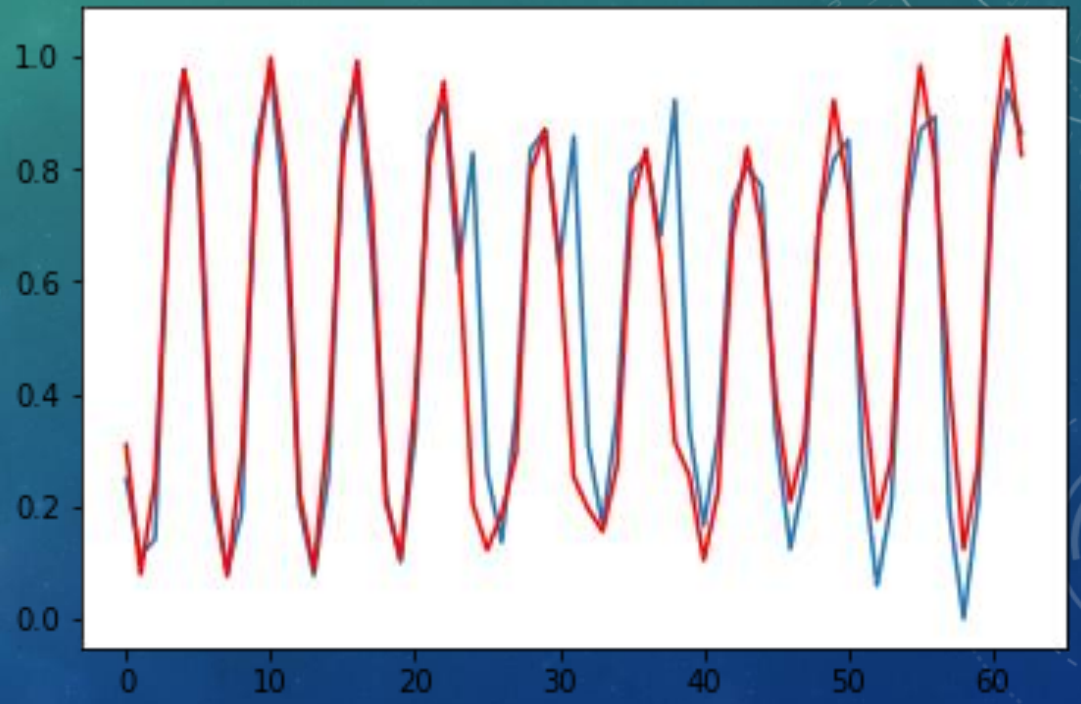
HIGH CONVERGENCE

SOME CHANGE OVER LARGE PERIOD OF TIME

EXAMPLE: CIC



BEFORE CONSIDERING DEPENDENCIES:
-Irregularities in the data effecting our prediction



AFTER CONSIDERING DEPENDENCIES:
-Irregularities in the data NO LONGER EFFECT

FUTURE FEATURES:

- GIVE .N TAKE .N