

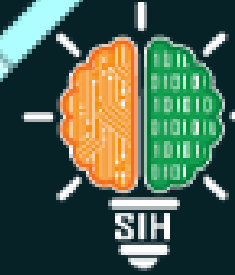
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IDENTIFICATION OF HERITAGE MONUMENTS

-DONE BY
DHARSHINI

PROBLEM STATEMENT



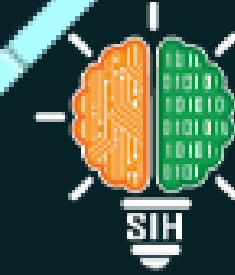
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To identify the monuments from Satellite Images using
Deep Learning and Integration of Interpretability
for the predicted outcomes (Explainable AI).



PROPOSED SOLUTION



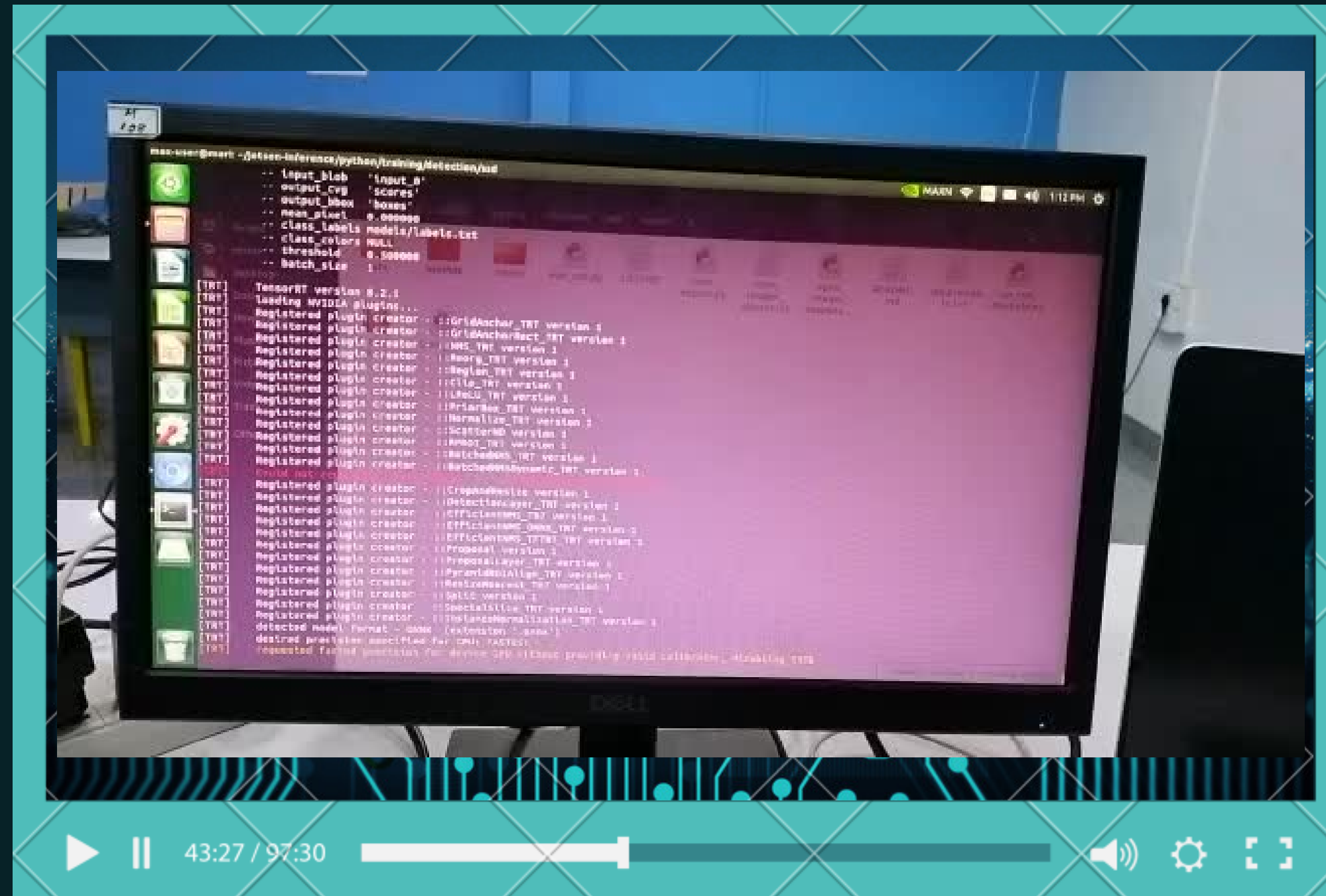
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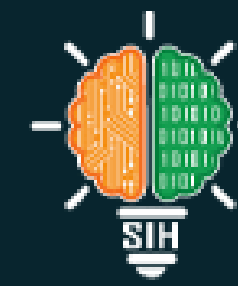
- The monuments are identified using yolov5 & yolov7 ML framework and deployed in Edge device(**Jetson nano**).
- **Explainable AI** is also integrated with predicted outcomes for the identified monuments.



PROJECT PREVIEW

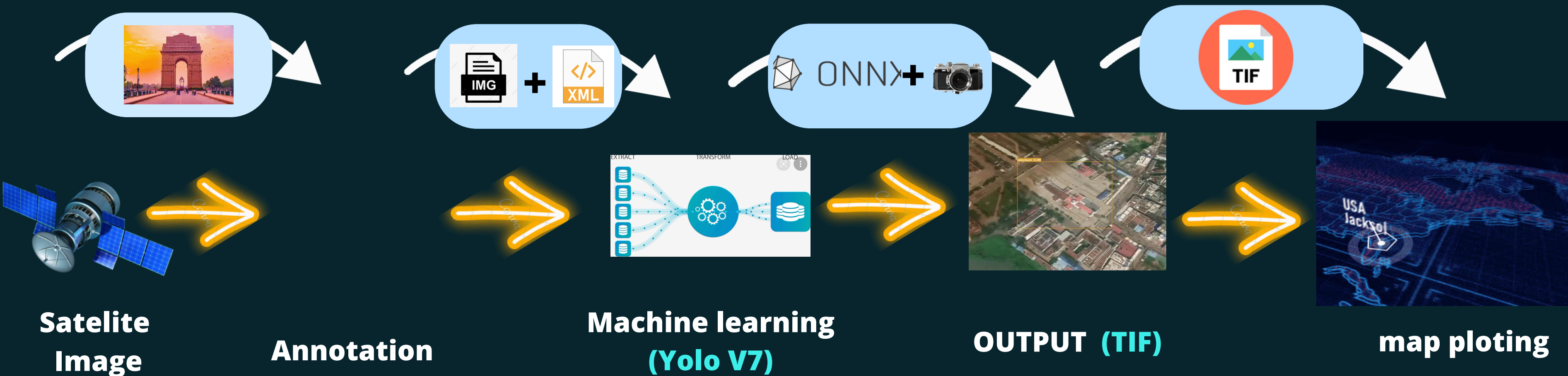


Block diagram

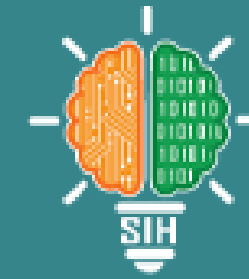


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ABSTRACT



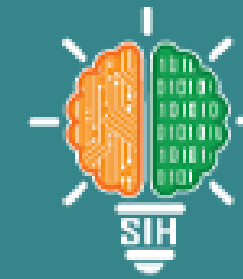
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- A plenty of heritage monuments are situated all over the world.
- Our aim is to identify the heritage monuments from **satellite images**
- To address this problem we developed a deep learning model.
- The custom model is developed by using **yolov7 object detection** ML framework.
- We have also deployed our model in **Jetson nano developer kit** (edge device) with real time input stream.
- For the predicted output **explainable ai** is developed which explains about how the predicted outcome is extracted.

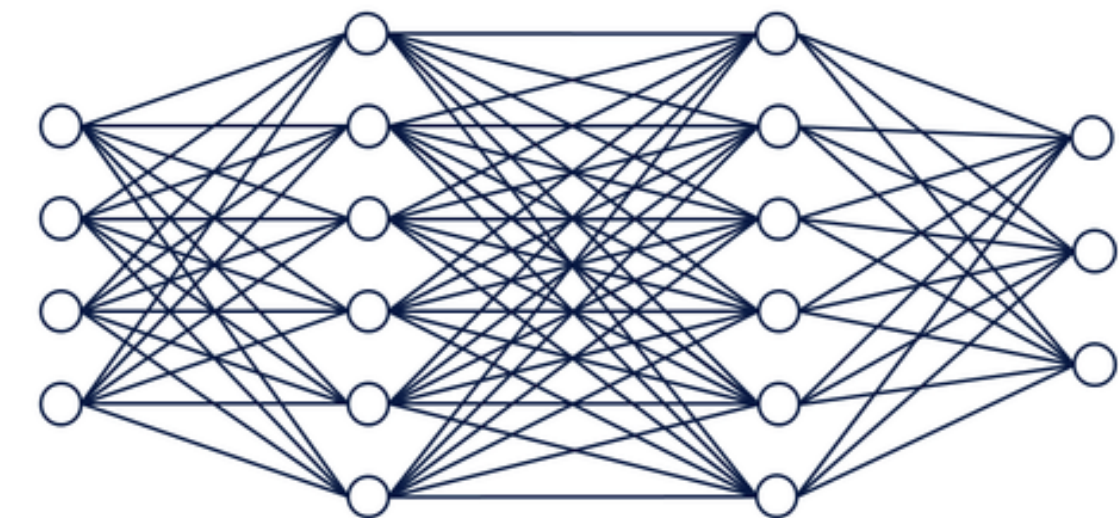
TECHNOLOGY STACK



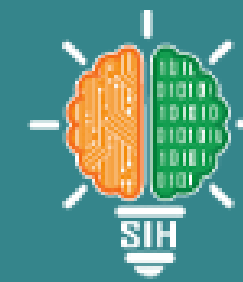
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- Input images is converted into pixels and forms n-dimensional array.
- By forward passing training begins with **epochs size 150** and image **size 416 x 416**.
- **Sigmoid Activation** and **Rectified Linear** unit function process the training by fine tuning the weights and bias.
- To update the weights **SGD optimiser** is used.
- object detector neural network take place and comparison made with the actual and prediction.
- In comparison losses will be found and rectified using backward passing



TECHNOLOGY STACK AI

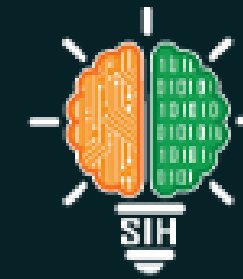


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- The input image is provided which is converted into pixels.
- **Keras** and Shap model is imported converts custom model into weights.
- Comparison takes place with input image and extract data from keras and add to weights.
- Output is generated by finding similarities with specification and also predicts the accuracy
- Input Images are separated as segments with pixels size 26x26 to check pixel by pixel for weights.
- Using matplotlib library output is visualized.
- It consists of 4 output images
- Variation in color denotes the accuracy and predicted output and given input accuracy is found.





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WORKFLOW



Data collection

We have created our **own dataset**.

Our dataset consists of satellite images collected from google earth and also with the help of landsat.



Preprocessing Data

After data collection More dataset is preprocessed and annotated accurately using **CVAT**(computer vision annotation tool)



Training custom model

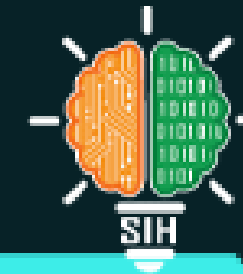
After preprocessing the dataset is trained using **yolov7 object Detection** Algorithm and generated the custom data model in .onnx weights file.



Prediction of output

Predicted the output on both **video** and **real time webcam** inference

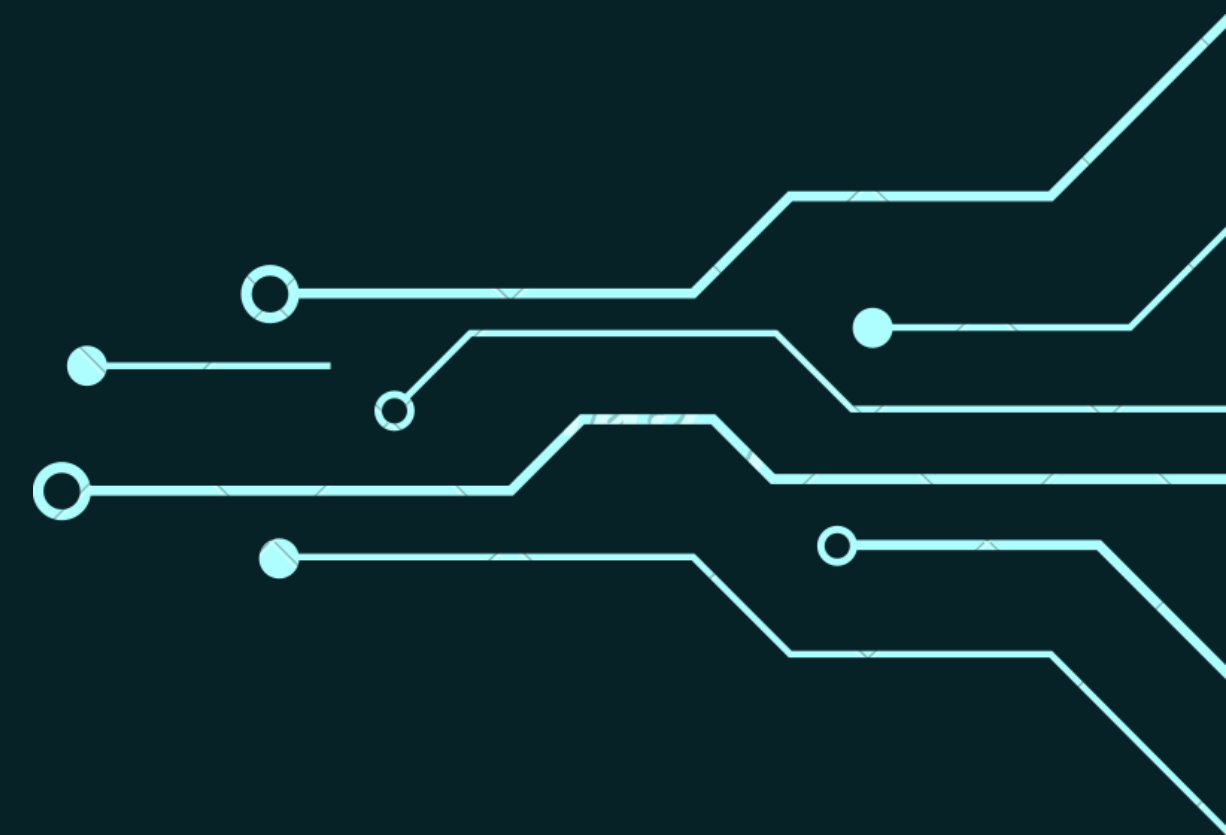
PROJECT APPLICATION :

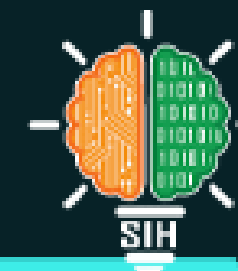


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- Our project is actually a prototype of Landsat.
- Which is similar to NavIC (Indian Regional Navigation Satellite System (IRNSS)).
- We just need to Upload our Source code as a module in the NavIC by using Angular JS.
- By doing this we will be able to show the world our heritage richness there by making our India a land of rich heritage.





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THANK YOU