Tech Mahindra

COGNITIVE POLE RECONCILIATION

Tech Mahindra's computer vision (CV)-based platform helps to recognize and reconcile the presence of a telecom pole by leveraging Google Street View repository and artificial intelligence (AI) frameworks.

In the telecom industry, clients have several telecom assets on the field (network poles in this case), which are spread across the country. Often, the mapping of their geo-location in the database is inconsistent and thus, companies are unable to take advantage of the data for their decision-making.

OUR SOLUTION

Tech Mahindra's master solution demonstrates the use of CV to potentially reconcile physical inventory on the field with the database for reliable decision-making. CV- based platform is used to recognize and reconcile the presence of the telecom pole by leveraging multiple data sources and AI frameworks.

Features of the Solution

- Connector to extract images from Google Street View with parameter adjustment
- Pole detection with observed accuracy in the range 87%-91% depending on thresholds. Detection using deep learning model - Faster R-CNN with Inception v2
- Reconcile location for the detected poles (true positive cases)
- Compute new location coordinates for detected poles and reconcile new location coordinates
- Auditing reports for user to review detection
- Process automation from pole detection to reconciliation
- Solution can be augmented to configure other data sources or for automatic image capture/labelling of telecom pole images.

KEY CHALLENGES

This physical inventory is widely distributed on the field, and there is human intervention when it comes to dealing with these assets. Because of the distributed and dynamic nature of the inventory, unlike many other physical inventories, which can be physically confined to one or more warehouses, the problem becomes more complex due to the inconsistency between the actual pole location on the field and the database. A crucial bookkeeping in the telecom industry involves recording pole location information on the field into databases. This information is crucial because location information is used during the planning and operation process to create a plan for installation/maintenance/repair/survey and various other pursuits. The information needs to be accurate and reliable for the same.

The digital transformation is executed with three key stages to reconcile the database:

- Detect and assert the existence of telecom poles for the given input coordinates and thus validate the captured pole locations
- Compute more accurate location coordinates of the poles detected or resolve any ambiguity for the given input location as applicable
- Update the newly computed location of the poles into the business database

Solution Technology

The model is trained using ~4K sampled images (telecom poles) so that considerable variance (based on manual observation) is captured in the model. The classes POLE, HEAD, BODY, NO_POLE, NO_HEAD is used to classify the images for positive (pole exists), negative (pole does not exist or a lamppost or electric poles), and partially positive cases (pole seen partially).

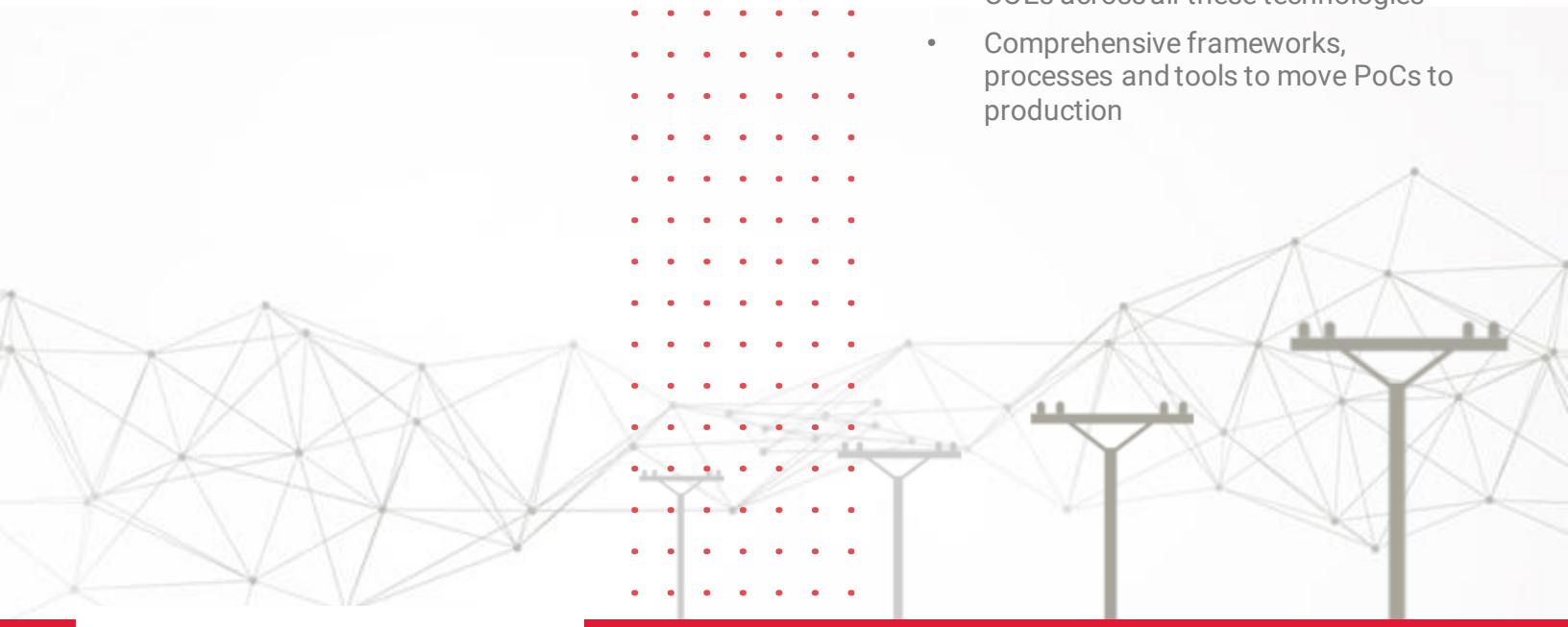
The solution does a panorama query of Google Street View for the input location, invokes the machine learning model to detect the object (pole) and iterates in this fashion on the panorama to look for the input pole. The Google Street View API parameters are conditionally adjusted during the iterations. If the model detects the pole in a given iteration (namely in a given direction), the process stops successfully since it has validated the given input location to contain a pole. This, otherwise, will require a human to key in the input geolocation to a street view or map service and manually examine the street view by looking at the panorama for the given location.

BENEFITS

- Enable efficient planning, operations, and execution through accurate inventory information
- Improvement in process efficiency and performance
- Minimize human effort in reconciliation and reduce manual error
- Reduce turnaround time and improve decision-making

TECHM NXT.NOW ADVANTAGE

- Diversified global player with 20+ years of data analytics and AI practice
- 11,000+ data, analytics, and AI associates with domain led consulting focus
- Global footprints across 55+ countries
- Partner-enabled ecosystem with COEs across all these technologies
- Comprehensive frameworks, processes and tools to move PoCs to production



To know more, reach us at
Wave2.Communications@techmahindra.com

Tech Mahindra
Connected World. Connected Experiences.