

Extracting Lane Markings on Satellite Images for Traffic Digital Twin using Computer Vision and Deep Learning

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Introduction

We are creating a **digital twin** of the **traffic network** to improve **mobility** and **energy efficiency**.

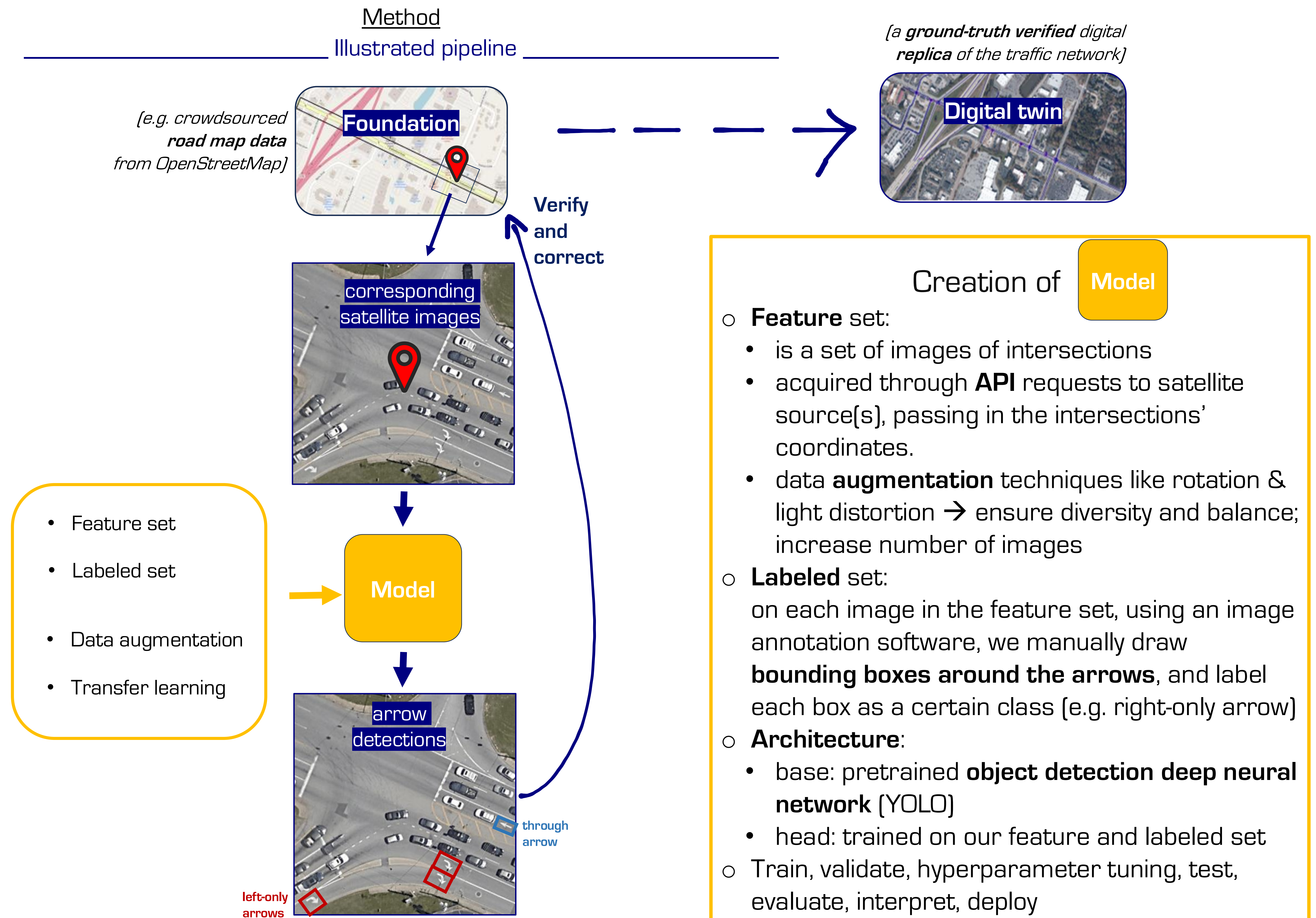
The foundation of the digital twin relies on data from open-source maps, which often has **inaccuracies** in **lane configuration**.

To correct this, we are leveraging **computer vision** and **deep learning** techniques to extract **lane markings** from publicly available **satellite** images.

Method

Illustrated pipeline

- ### Pipeline
1. Get road **intersections'** latitude-longitude coordinates
 2. Pull **satellite images** at these coordinates
 3. Input these images into the **trained model**
 4. For each image, the model **detects** the standard **arrows** for pavement markings and **classifies** their type (left-only arrow, right-through arrow, etc.)
 5. Steps to connect the detected arrows to the specific lane they belong to
 6. Use this information to **update** the lane configuration at the corresponding intersection in the foundational network of the digital twin
 7. When all lane configuration of the network has been verified, it will be input into the digital twin.



Future Steps

- Create a pipeline and model for lane segmentation on satellite images
- Fuse information from satellite sources with street-level image sources

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References

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