

# SEMANTIC SEGMENTATION OF PHNOM PENH'S STREETSAPES

The utilization of semantic information from street view images (SVI) has been widely explored in city planning research. However, SVI-based methods have predominantly been trained and tested on SVI images from developed cities in the Global North, such as Western European or North American cities.

Currently, there exists a significant lack of findings regarding their effectiveness in Southeast Asian cities. Considering this knowledge gap, this study aims to evaluate the efficacy of semantic segmentation models in processing semantic information in Southeast Asian streetscapes.

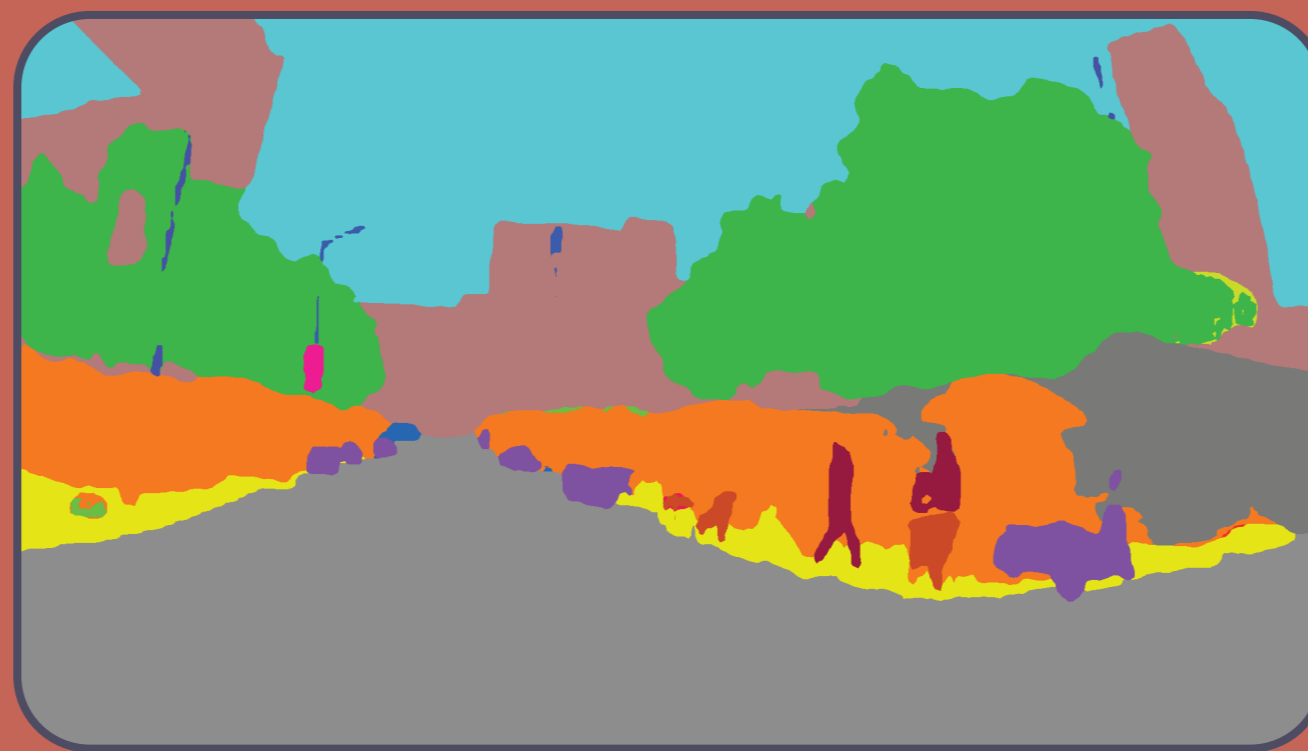


- Road
- Sky
- Tree
- Building
- Base
- Wall
- Sidewalk
- Minibike
- Person
- Chair
- Pole
- Signboard
- Plant
- Streetlight
- Car
- Box
- Awning
- Table
- Rock

## Segmentation Process



Static Image



Segmentation Results



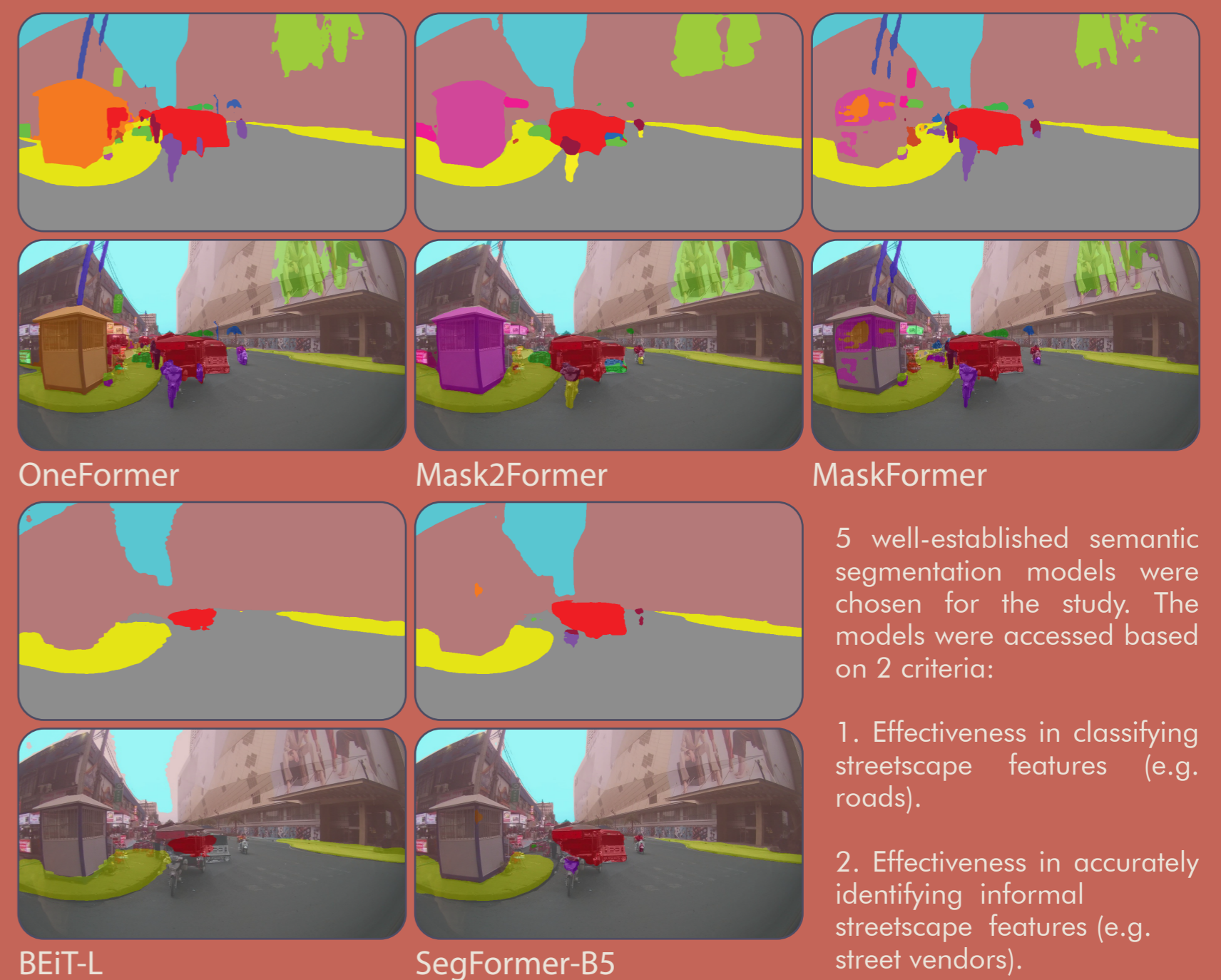
Image + Segmentation Overlay

In total, 24,986 images were collected from Mapillary, a crowdsourcing platform for image data. The Mapillary's Application Programming Interface (API) was used to download and access the images. Each image was identified by a unique image ID, which was utilized to obtain the images from Mapillary. Of the total images, 8,912 images were usable.

Semantic segmentation is an important computer vision task with the goal of categorizing each pixel in an image to a class or object. Each colour represents a distinct physical features of the streetscape. Semantic segmentation models are trained and fine tuned on large image datasets to perform semantic segmentation tasks.

After the semantic segmentation process, the segmentation results are overlaid onto the original static image. Visually, the overlaid image makes clearer the relationship between each street feature and its corresponding class in the image. The overlaid image also gives a clearer picture of how the street features are segmented, making it look more visually appealing.

## Model Comparisons



5 well-established semantic segmentation models were chosen for the study. The models were accessed based on 2 criteria:

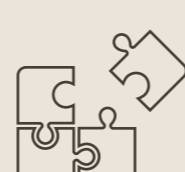
1. Effectiveness in classifying streetscape features (e.g. roads).
2. Effectiveness in accurately identifying informal streetscape features (e.g. street vendors).

### Understand



Interactions between streets and their users better

### Complement



Existing approaches to urban studies (e.g., walkability indices)

### Optimize



Future segmentation models to better suit the Southeast Asian street context

MUSPP Masters Research Project

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Title: Assessing the efficacy of semantic segmentation models in Southeast Asian cities: A case study of Phnom Penh