


Разработка алгоритма определения железнодорожной колеи и подвижного состава для предотвращения чрезвычайных ситуаций на железной дороге

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О себе

- Kaggle Master ([profile link](#))
- Computer Vision Engineer



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3rd place solution
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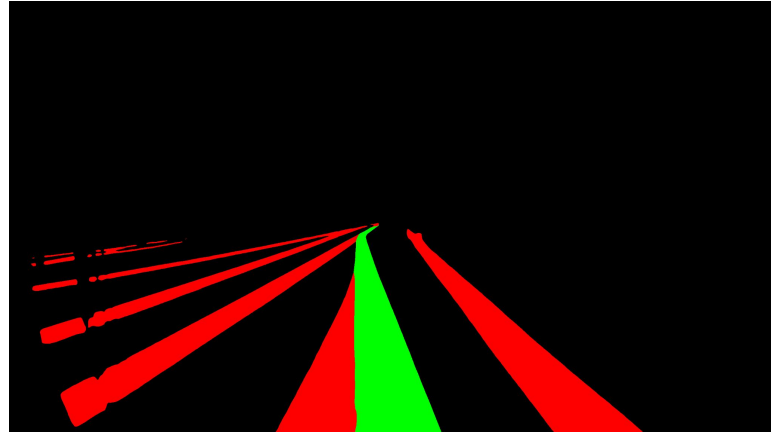
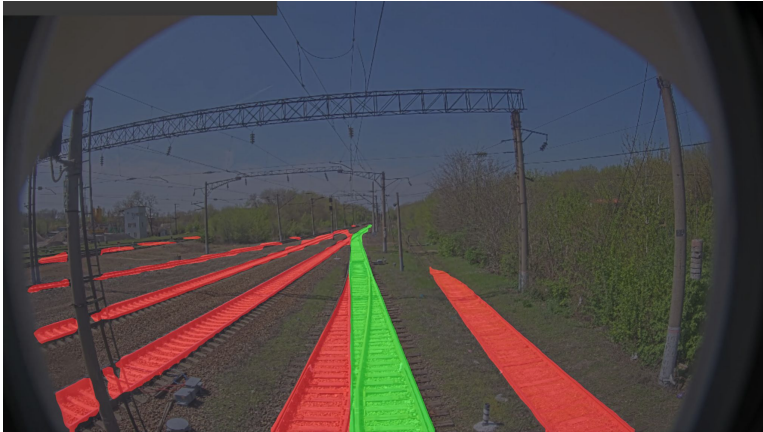
Ключевые детали решения

- Глубокие модели ([SegFormer](#), [UperNet-Swin-large](#))
- Современные методы тренировки нейронных сетей для задачи semantic segmentation
- Большое разрешение изображений
- стек: linux, python3, docker, [mmsegmentation](#)

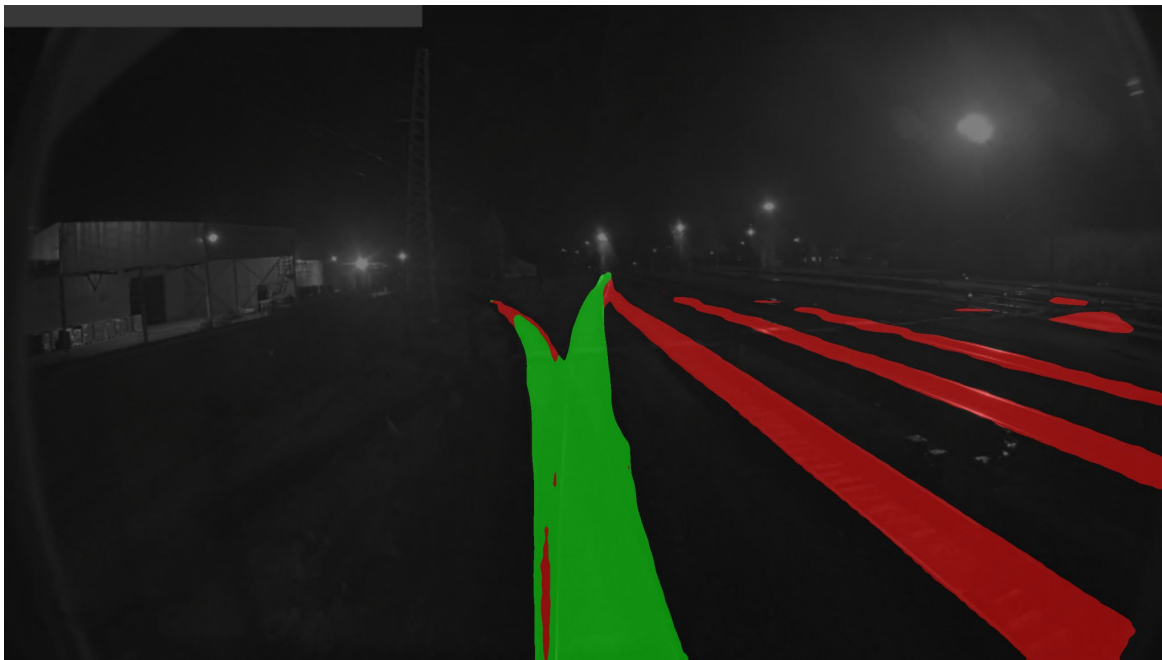
Сложности данных

```
img_scale=(768, 1024),
```

```
img_scale=(2560, 1440)
```



Сложности данных



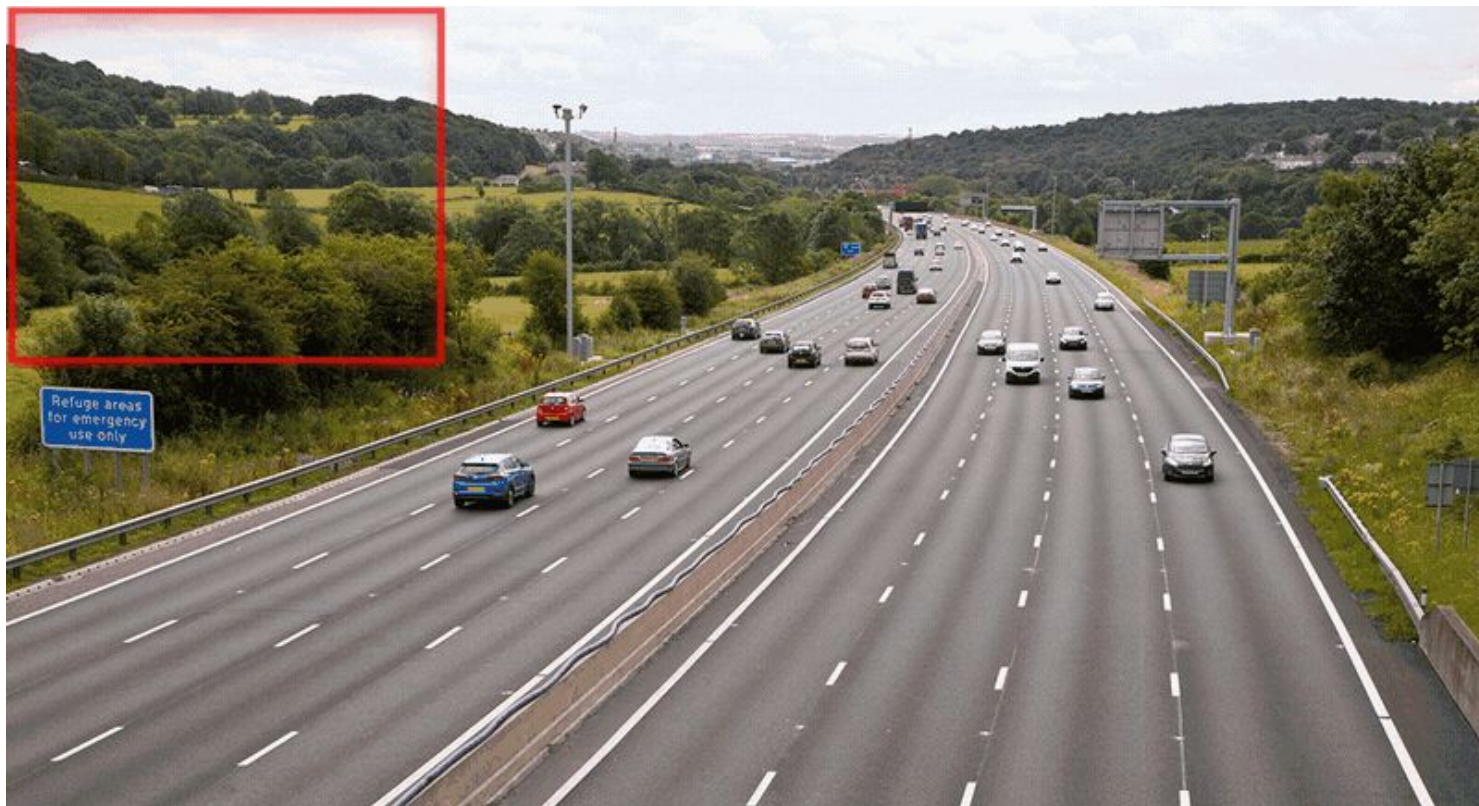
Результаты

| model | img_scale | crop_size | inference mode | img ratios | flip | CV | LB |
|--|--------------|--------------|----------------|------------------|--------------------|---------------------|--------|
| <code>deeplabv3_r101-d8</code> | (768, 1024) | (512, 1024) | whole | [1.0] | <code>false</code> | <code>0.8865</code> | 0.8201 |
| <code>segformer mit-b5</code> | (2048, 1024) | (1024, 1024) | slide | [1.0] | <code>false</code> | <code>0.9114</code> | 0.8518 |
| <code>segformer mit-b5</code> | (2048, 1024) | (1024, 1024) | slide | [1.0, 1.33, 1.5] | <code>true</code> | - | 0.8680 |
| <code>swin large patch 4 window12 384</code> | (2560, 1440) | (1024, 1024) | slide | [1.0] | <code>false</code> | <code>0.9121</code> | - |

Результаты

| model | img_scale | crop_size | inference mode | img ratios | flip | CV | LB |
|--|-----------------|-----------------|----------------|-------------------------------------|-------------------|----|--------|
| <code>swin_large_patch 4_window12_384</code> | (2560, 1440) | (1024, 1024) | slide | [1.0, 1.33] | <code>true</code> | - | 0.8660 |
| <code>swin_large_patch 4_window12_384</code> | (2560, 1440) | (1024, 1024) | slide | [0.75, 0.85, 1.0, 1.15, 1.33] | <code>true</code> | - | 0.8720 |

inference mode: whole vs slide



Если бы решение интегрировалось в продакшн

- Подход нужно ускорять (best sub: ~1/60 fps)
- Формулировку задачи возможно нужно поменять/изменить способ сбора данных