

# MRZ Field Segmentation

Inference Results on Test Set

Model: Hough Encoder (HEDMRZ)

*Best model checkpoint | val\_mIoU\_seg: 0.9220*

Samples: 100

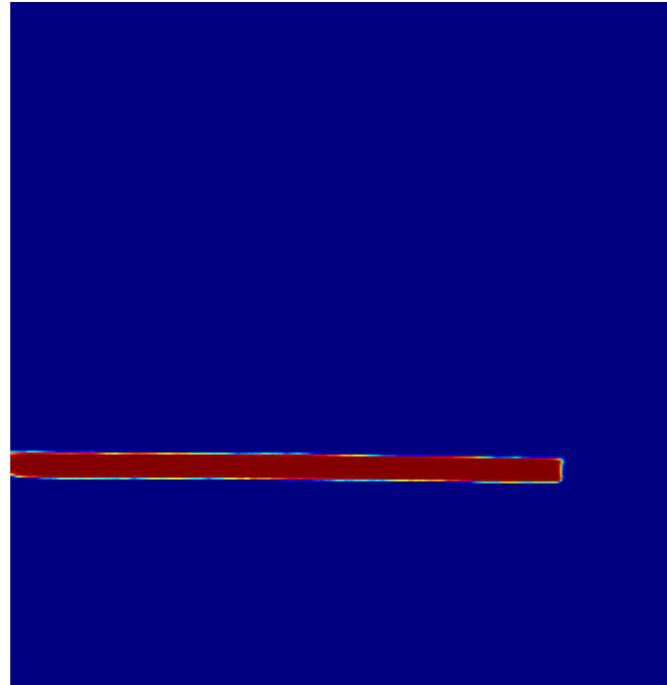
Mean IoU:  $0.9108 \pm 0.1377$

Median IoU: 0.9396

Original  
srb\_passport (clips)



Probability Heatmap



Mask Overlay



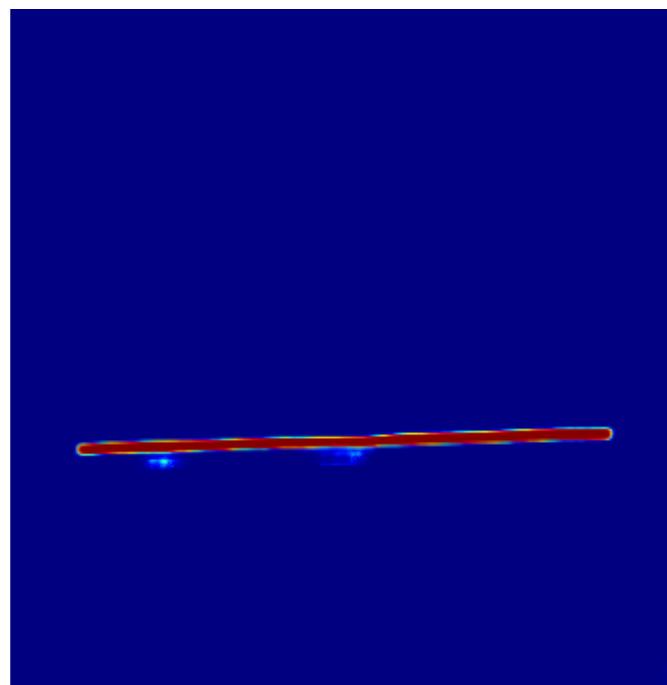
OBB Detection  
IoU: 0.934



Original  
34\_mda\_passport (unknown)



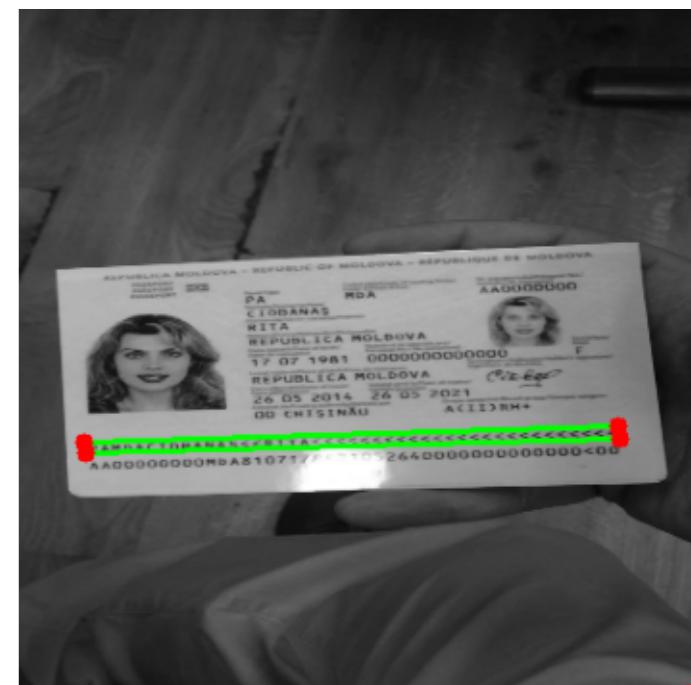
Probability Heatmap



Mask Overlay



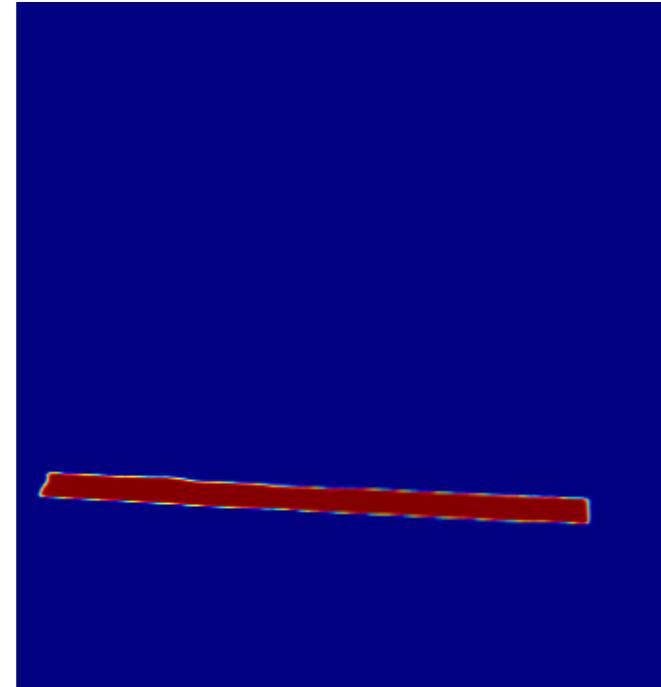
OBB Detection  
IoU: 0.905



Original  
lva\_passport (clips)



Probability Heatmap



Mask Overlay



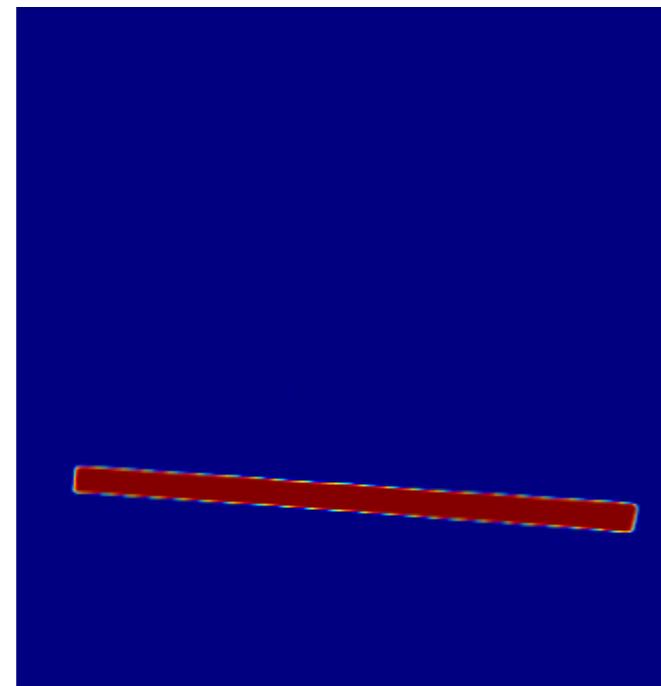
OBB Detection  
IoU: 0.940



Original  
32\_lva\_passport (unknown)



Probability Heatmap



Mask Overlay



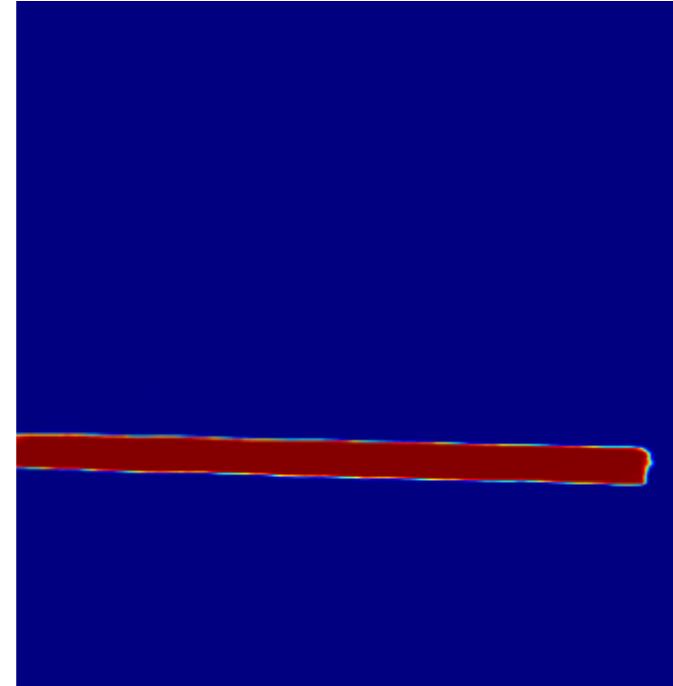
OBB Detection  
IoU: 0.936



Original  
17\_deu\_passport\_old (unknown)



Probability Heatmap



Mask Overlay



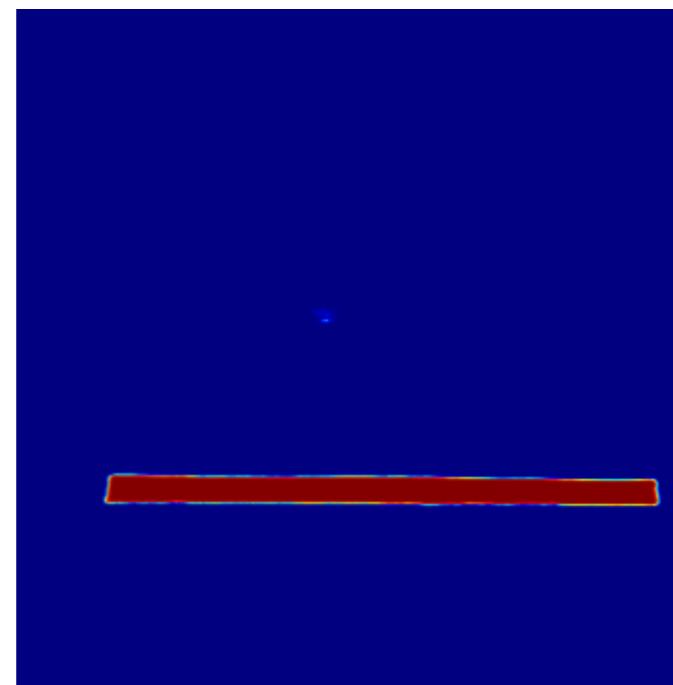
OBB Detection  
IoU: 0.960



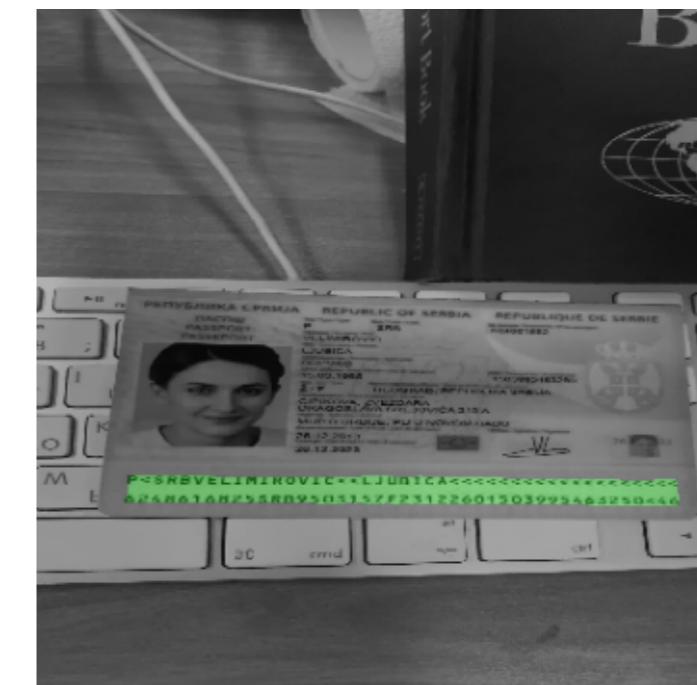
Original  
srб\_passport (clips)



Probability Heatmap



Mask Overlay



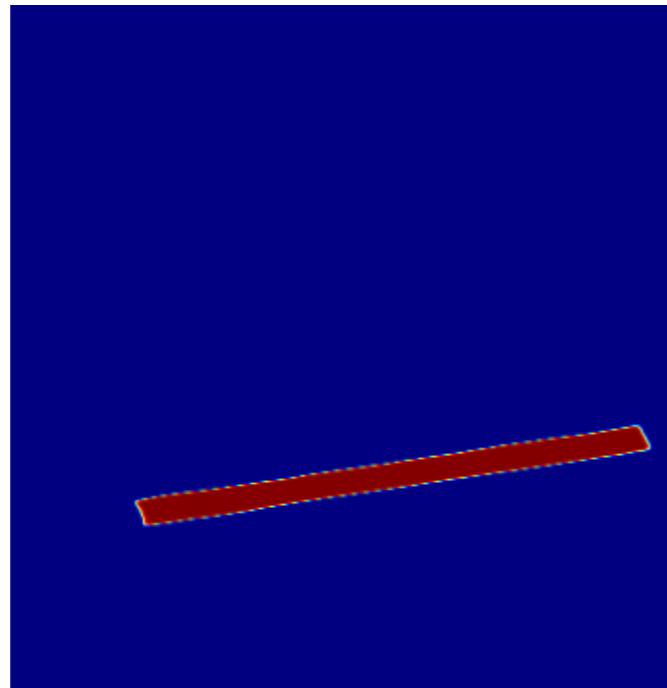
OBB Detection  
IoU: 0.954



Original  
18\_dza\_passport (unknown)



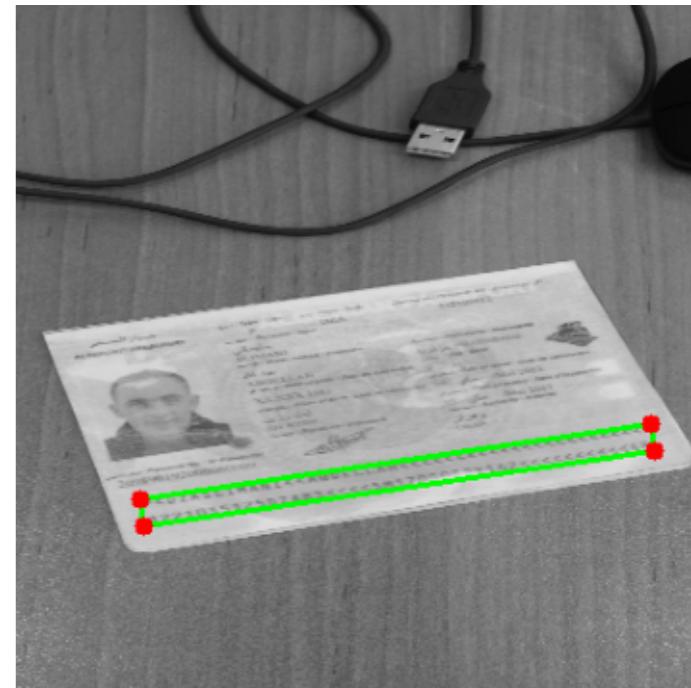
Probability Heatmap



Mask Overlay



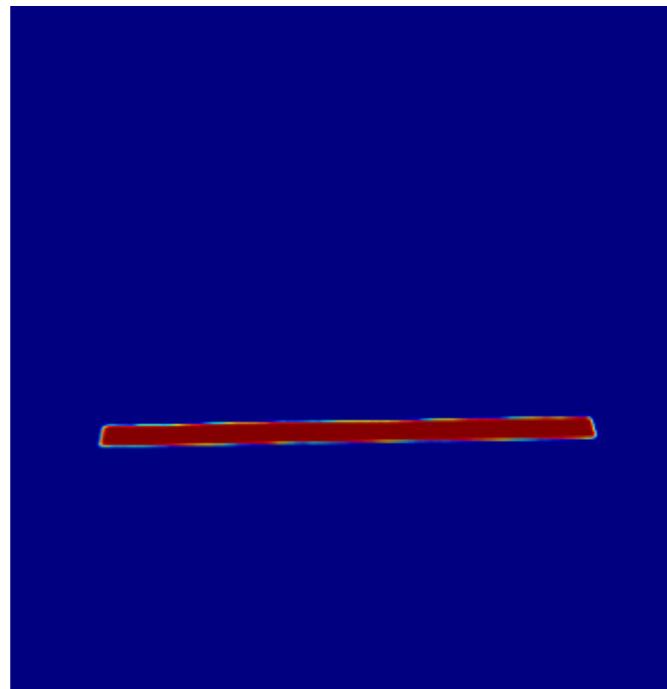
OBB Detection  
IoU: 0.961



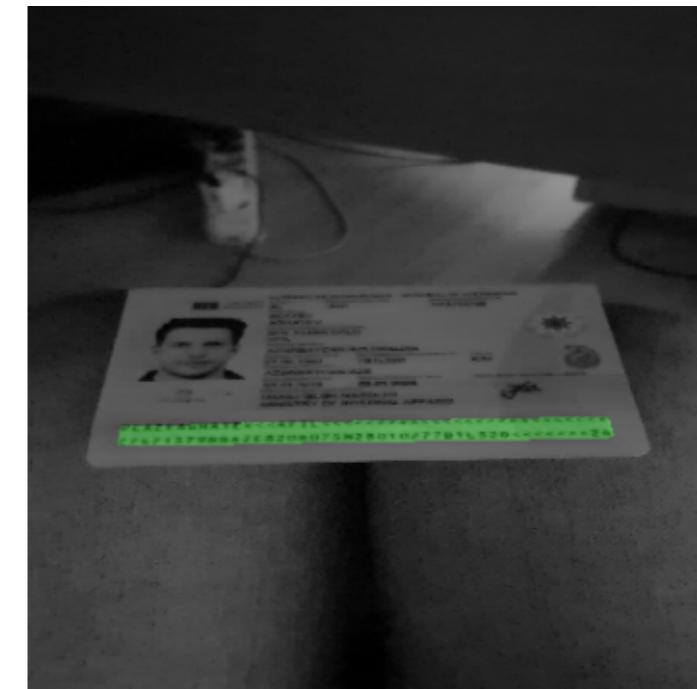
Original  
aze\_passport (clips)



Probability Heatmap



Mask Overlay



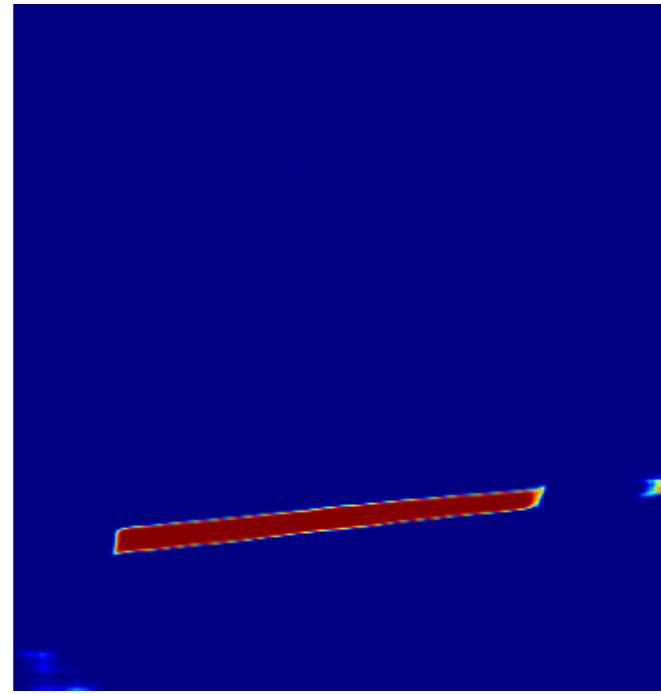
OBB Detection  
IoU: 0.918



Original  
srb\_passport (clips)



Probability Heatmap



Mask Overlay



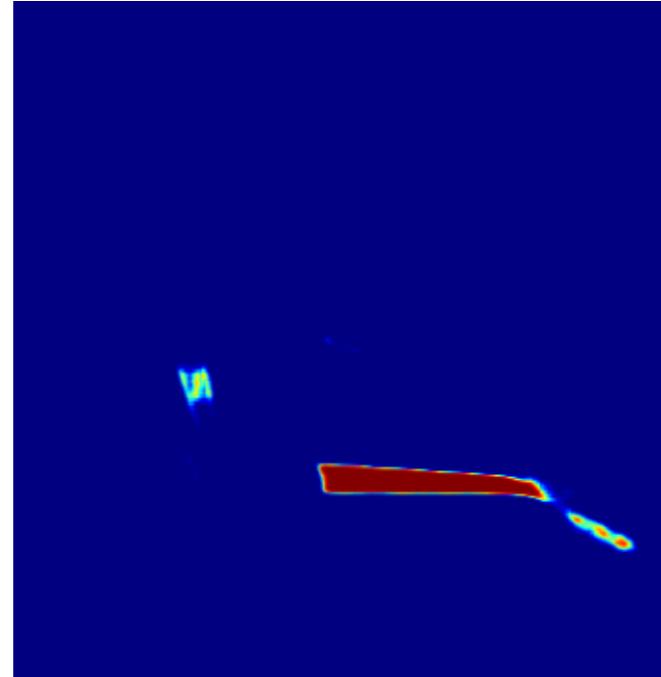
OBB Detection  
IoU: 0.891



Original  
grc\_passport (clips)



Probability Heatmap



Mask Overlay



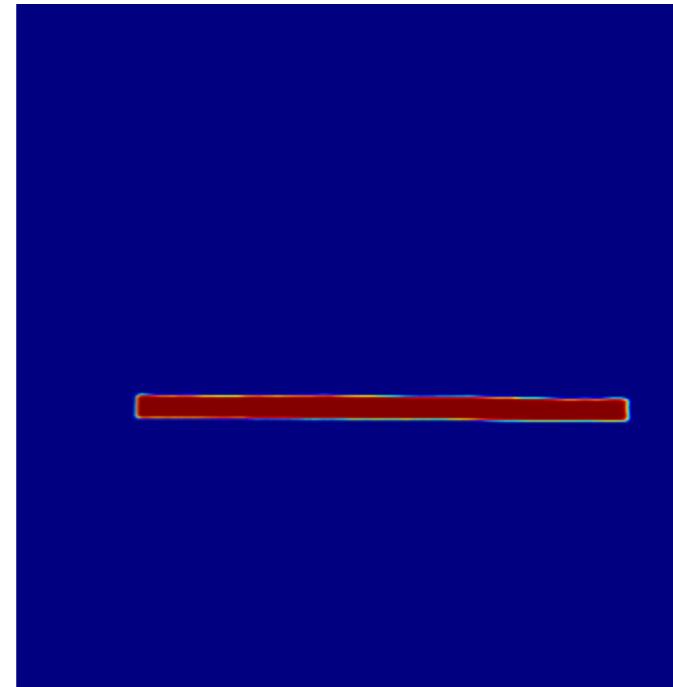
OBB Detection  
IoU: 0.715



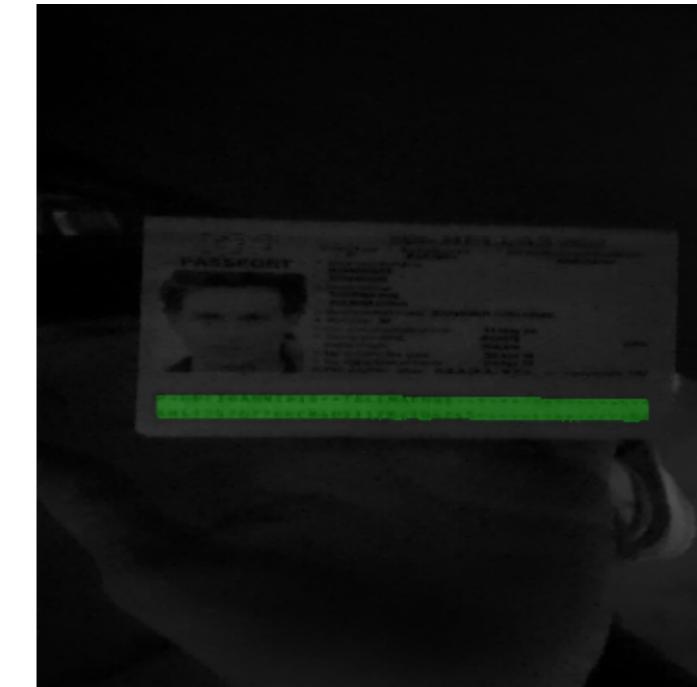
Original  
grc\_passport (clips)



Probability Heatmap



Mask Overlay



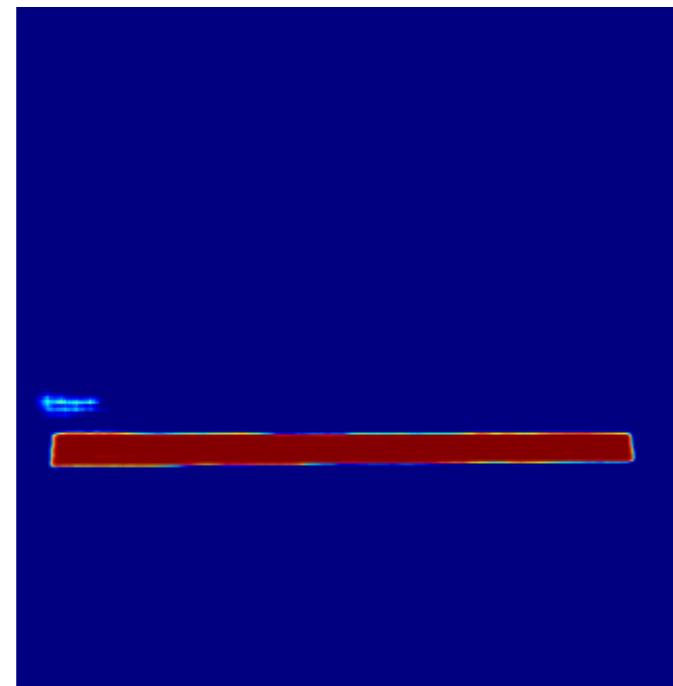
OBB Detection  
IoU: 0.930



Original  
05\_aze\_passport (unknown)



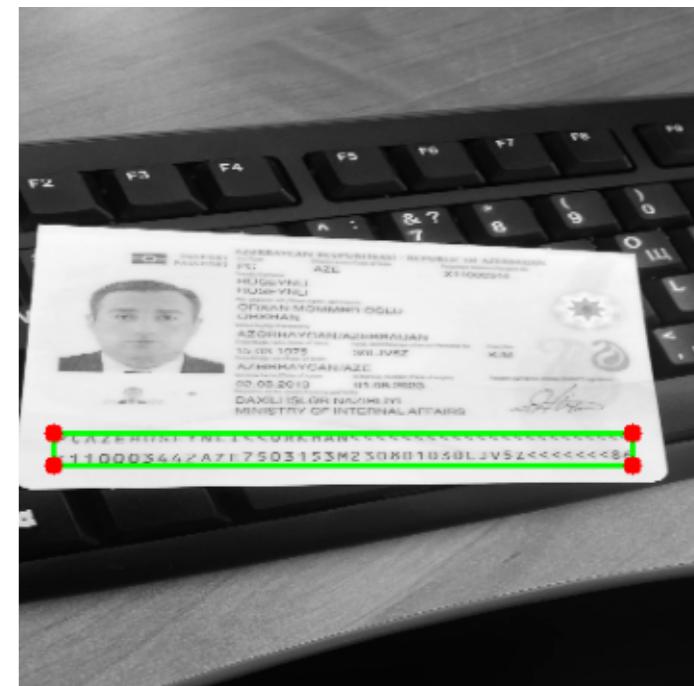
Probability Heatmap



Mask Overlay



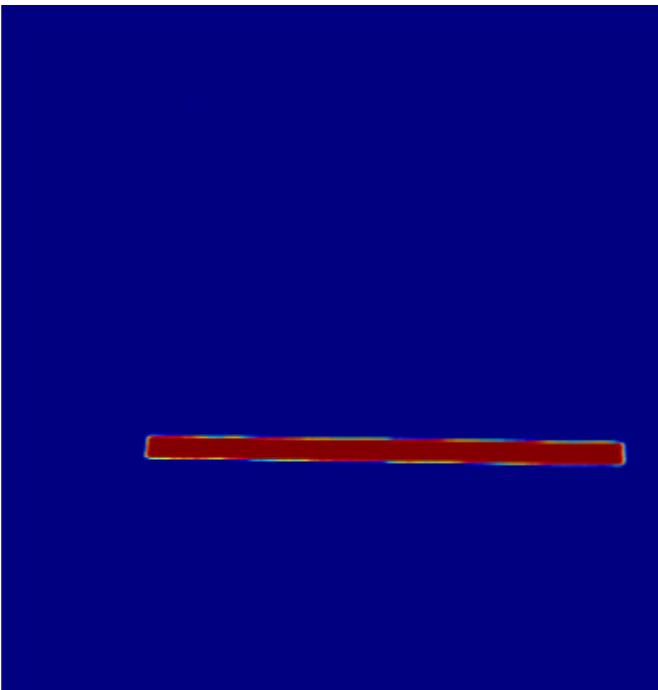
OBB Detection  
IoU: 0.939



Original  
grc\_passport (clips)



Probability Heatmap



Mask Overlay



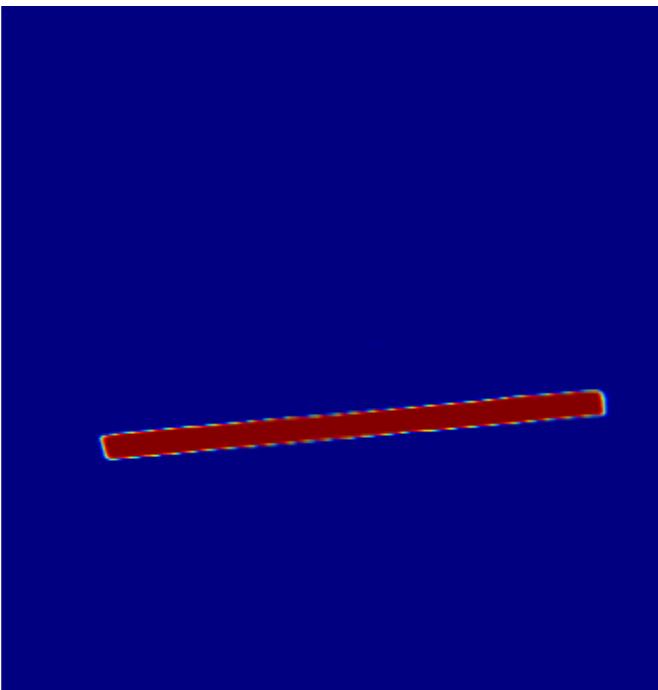
OBB Detection  
IoU: 0.949



Original  
17\_deu\_passport\_old (unknown)



Probability Heatmap



Mask Overlay



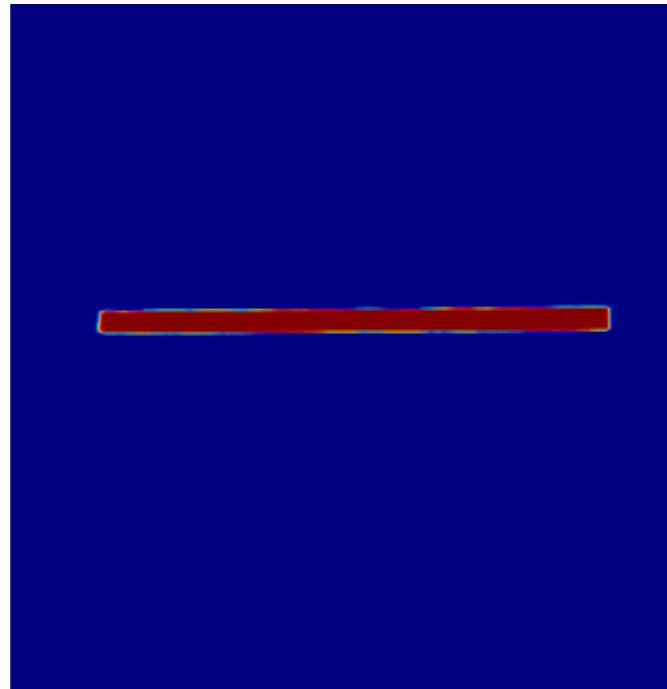
OBB Detection  
IoU: 0.939



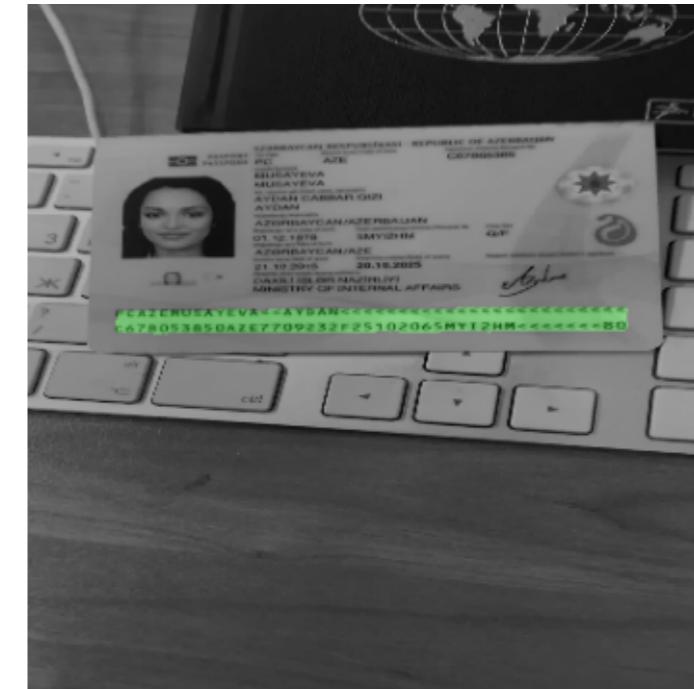
Original  
aze\_passport (clips)



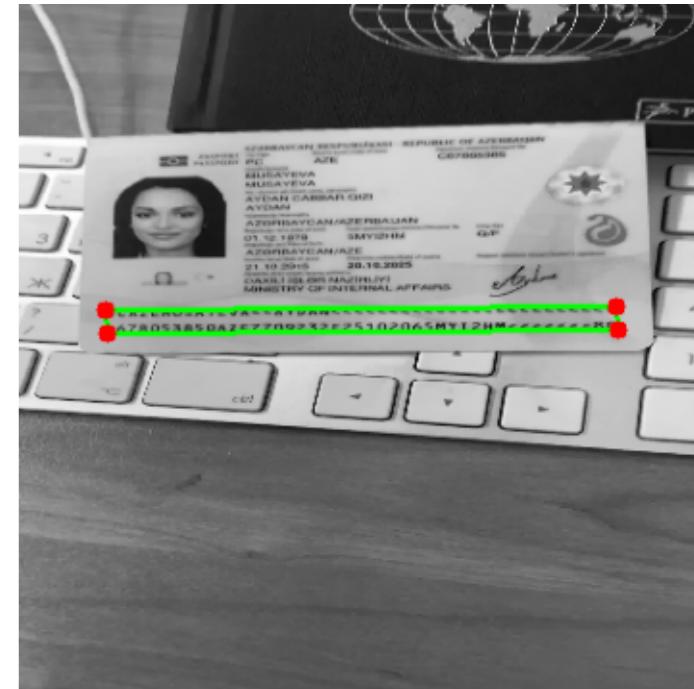
Probability Heatmap



Mask Overlay



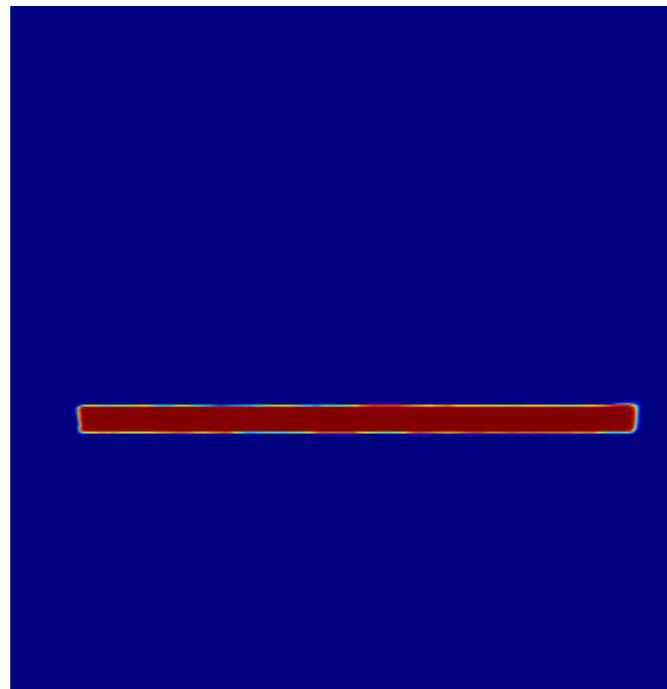
OBB Detection  
IoU: 0.920



Original  
18\_dza\_passport (unknown)



Probability Heatmap



Mask Overlay



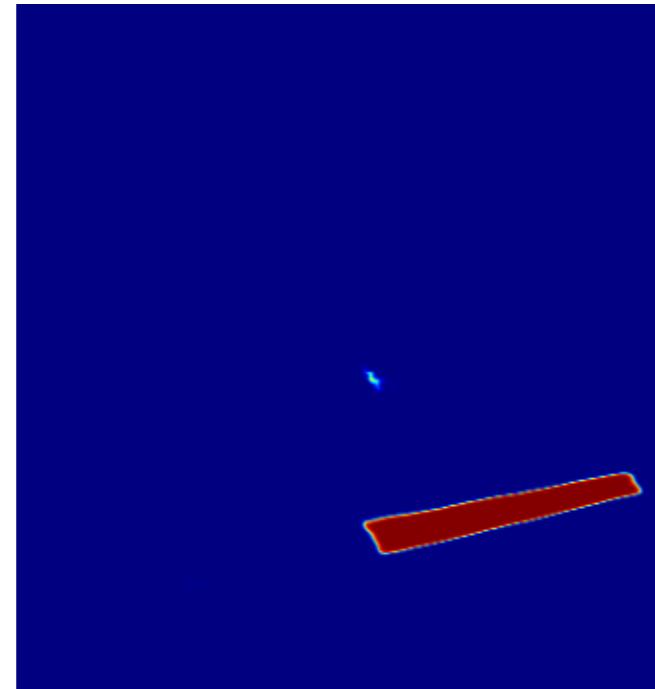
OBB Detection  
IoU: 0.948



Original  
srb\_passport (clips)



Probability Heatmap



Mask Overlay



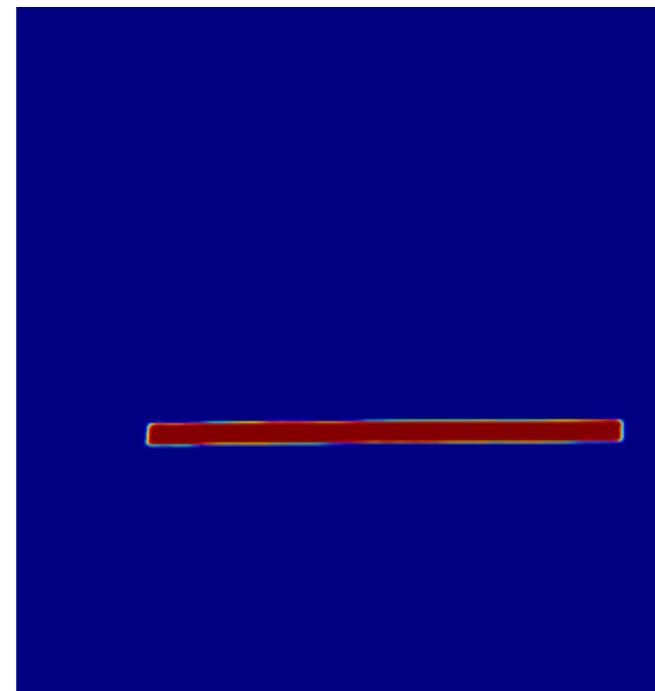
OBB Detection  
IoU: 0.930



Original  
lva\_passport (clips)



Probability Heatmap



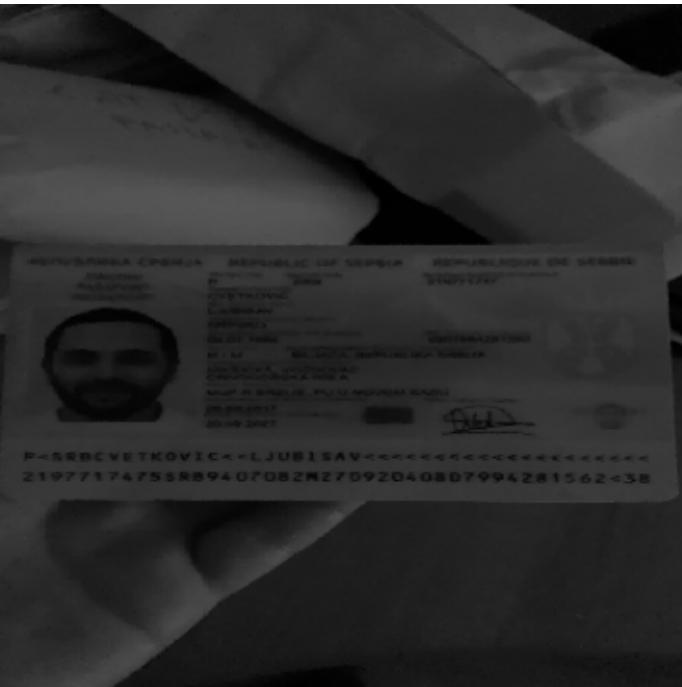
Mask Overlay



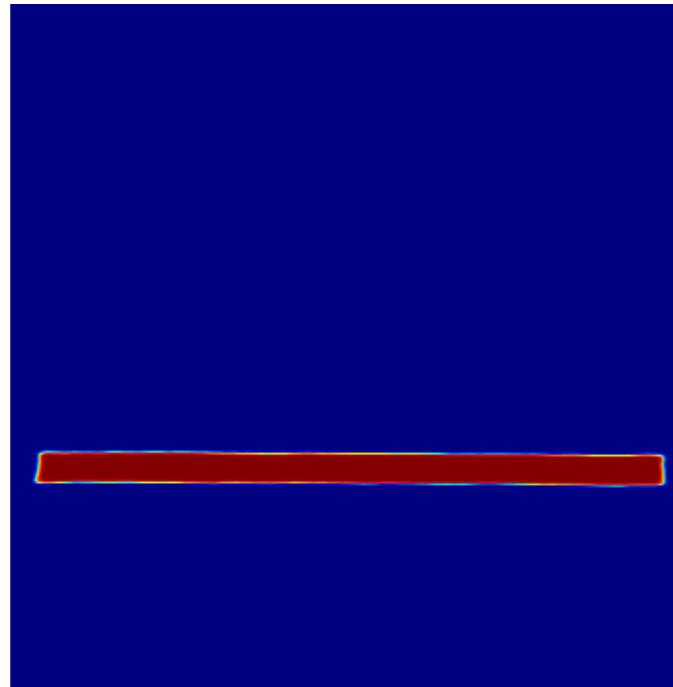
OBB Detection  
IoU: 0.931



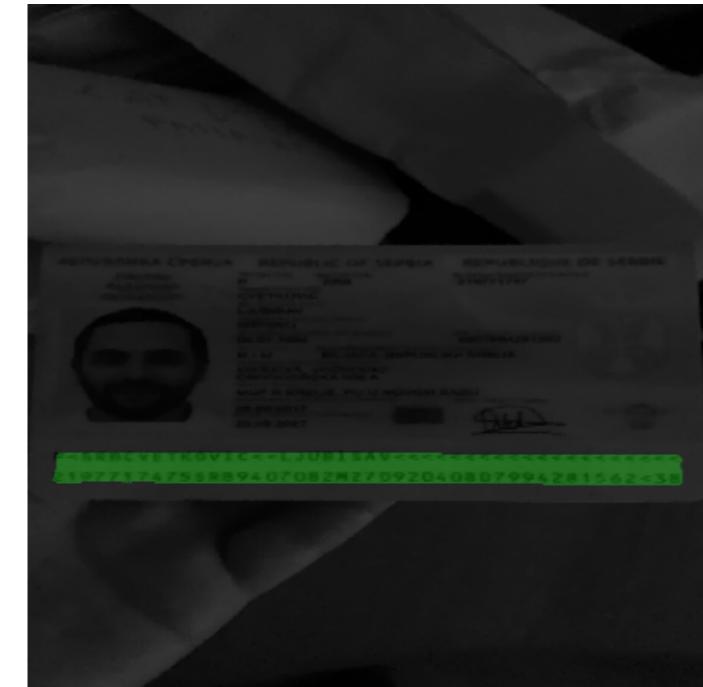
Original  
srb\_passport (clips)



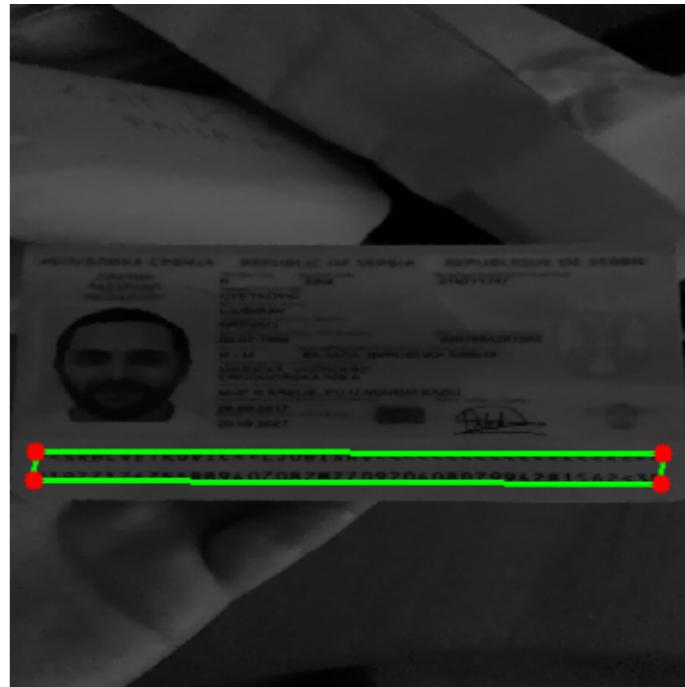
Probability Heatmap



Mask Overlay



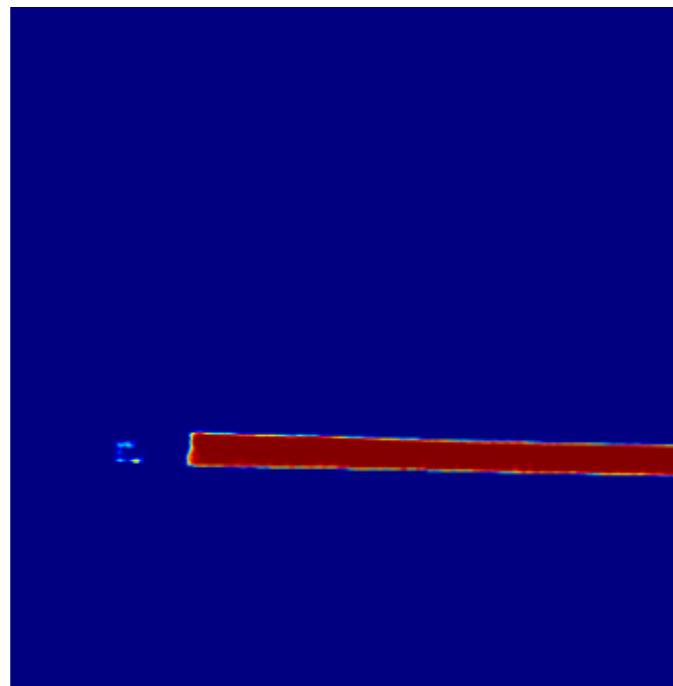
OBB Detection  
IoU: 0.966



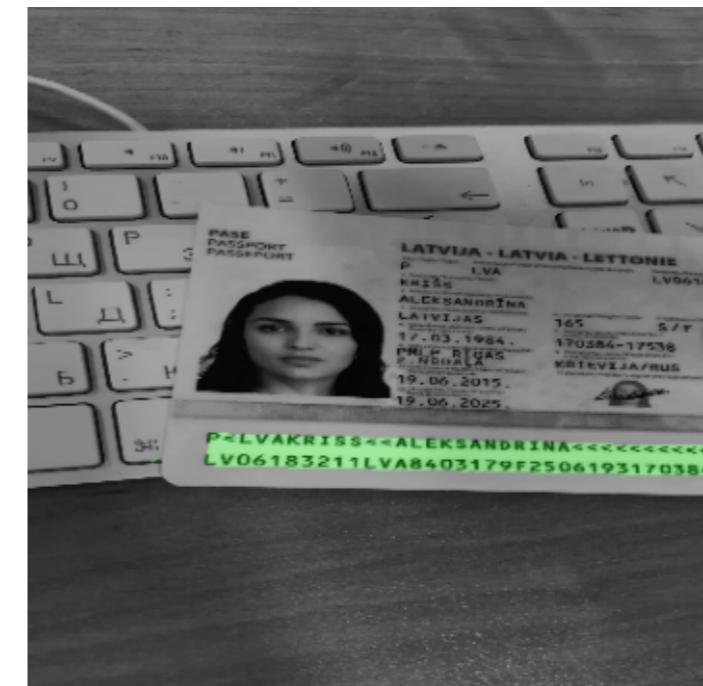
Original  
lva\_passport (clips)



Probability Heatmap



Mask Overlay



OBB Detection  
IoU: 0.857

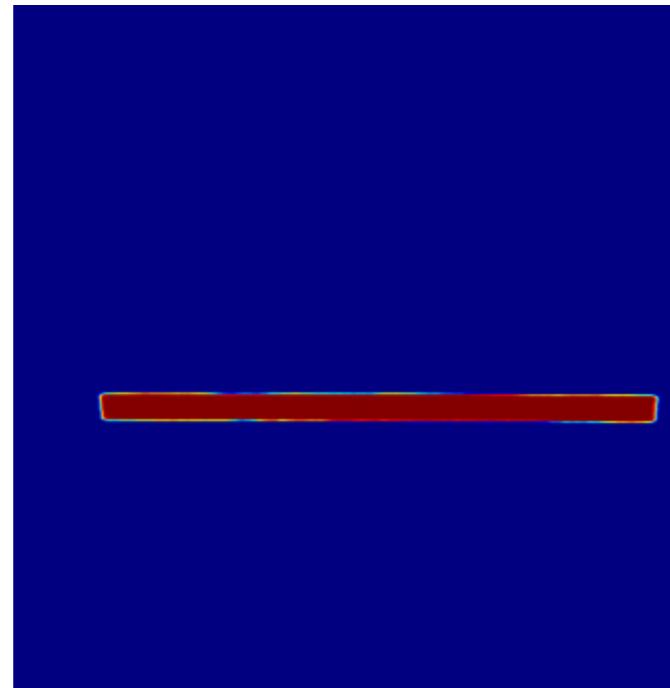


Original  
16\_deu\_passport\_new (unknown)



Original  
45\_ukr\_passport (unknown)

## Probability Heatmap



## Mask Overlay



OBB Detection  
IoU: 0.939

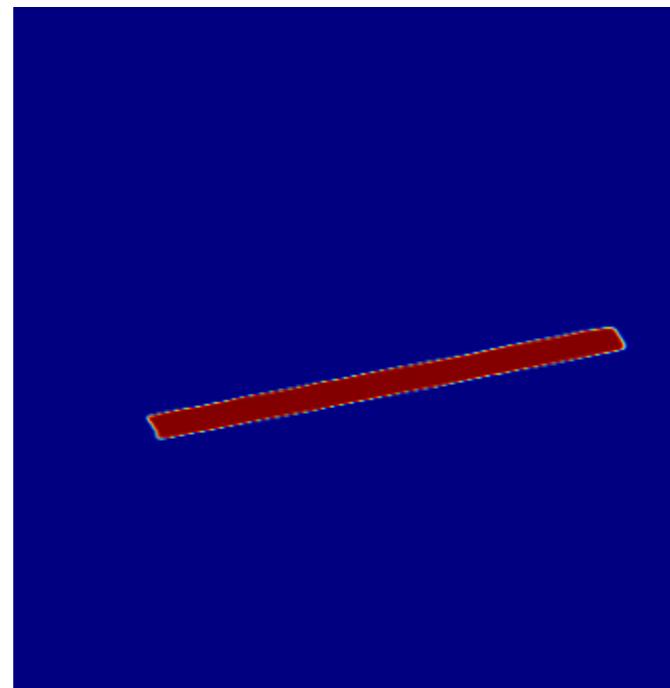


OBB Detection  
IoU: 0.955

A black and white photograph of a Ukrainian passport lying on a wooden desk. The passport is open, revealing its interior pages. The cover features a portrait of a young woman and the word "Ukraine". The passport contains various fields such as name, date of birth, and passport number. Several visas from different countries are attached to the pages. In the background, there are other items like a ruler, a pair of pliers, and a small IEEE badge.

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## Probability Heatmap



## Mask Overlay

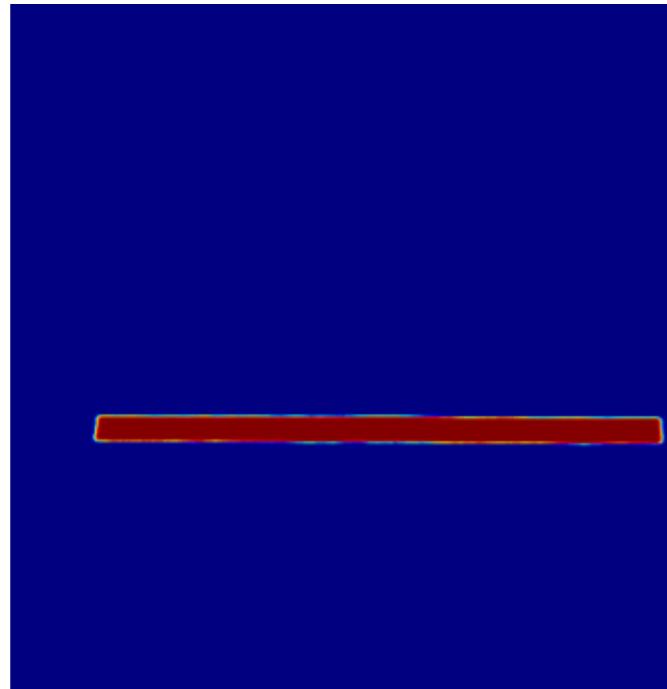


A composite photograph featuring a Ukrainian passport, a metric ruler, a screwdriver, and a white electrical cord. The passport is the central focus, resting on a dark surface. It shows a photo of a woman, the name 'YAROSLAVA B. UKRAINE', and a long string of numbers at the bottom. A red line has been drawn across the bottom of the passport, connecting the red dots on either side of the number string. The metric ruler is positioned above the passport, with its markings visible. To the left of the passport is a screwdriver. A white electrical cord with a 'NORES' label is visible on the right side of the frame.

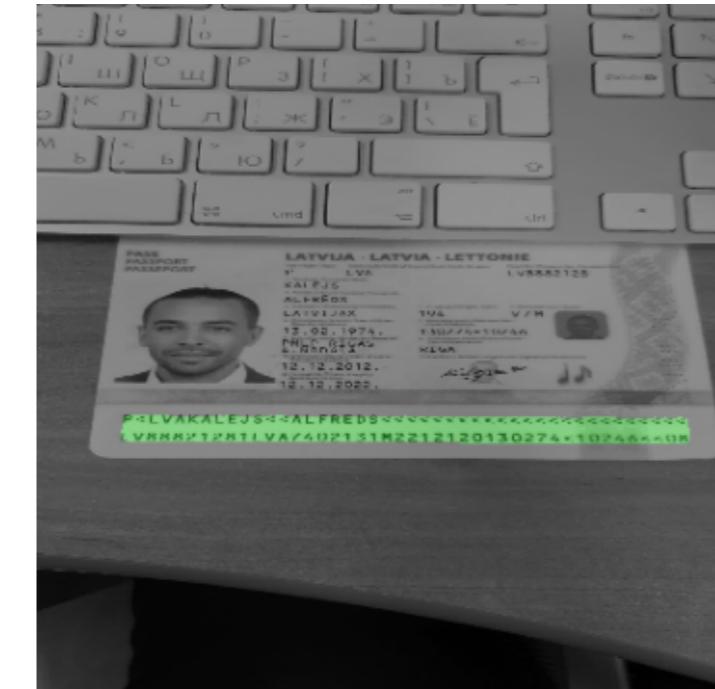
Original  
lva\_passport (clips)



Probability Heatmap



Mask Overlay



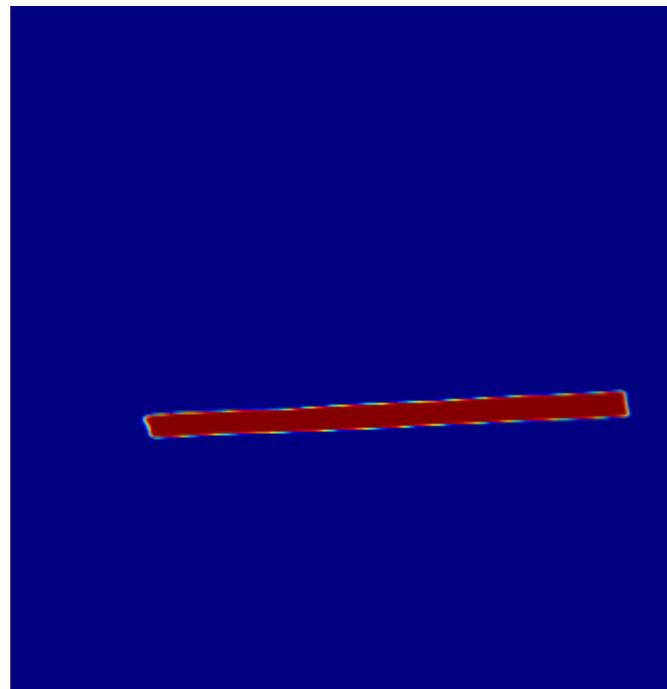
OBB Detection  
IoU: 0.948



Original  
28\_hun\_passport (unknown)



Probability Heatmap



Mask Overlay



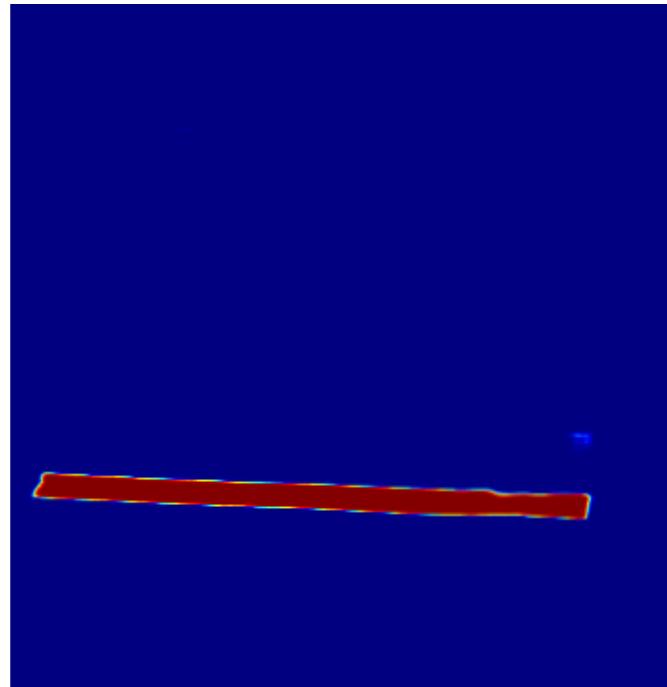
OBB Detection  
IoU: 0.958



Original  
Iva\_passport (clips)



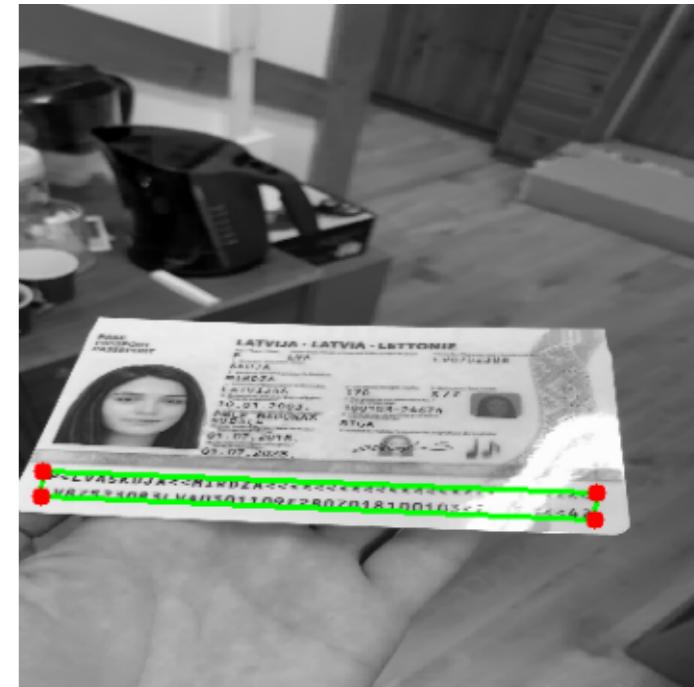
Probability Heatmap



Mask Overlay



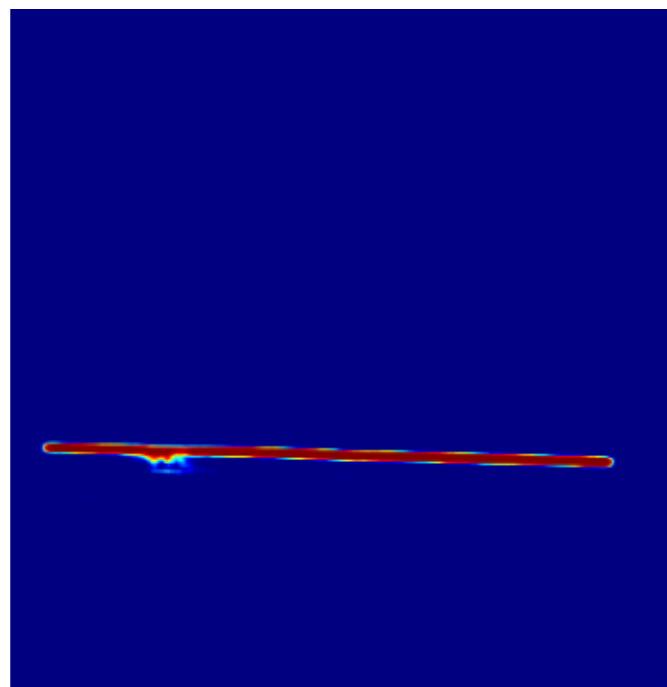
OBB Detection  
IoU: 0.947



Original  
41\_srb\_passport (unknown)



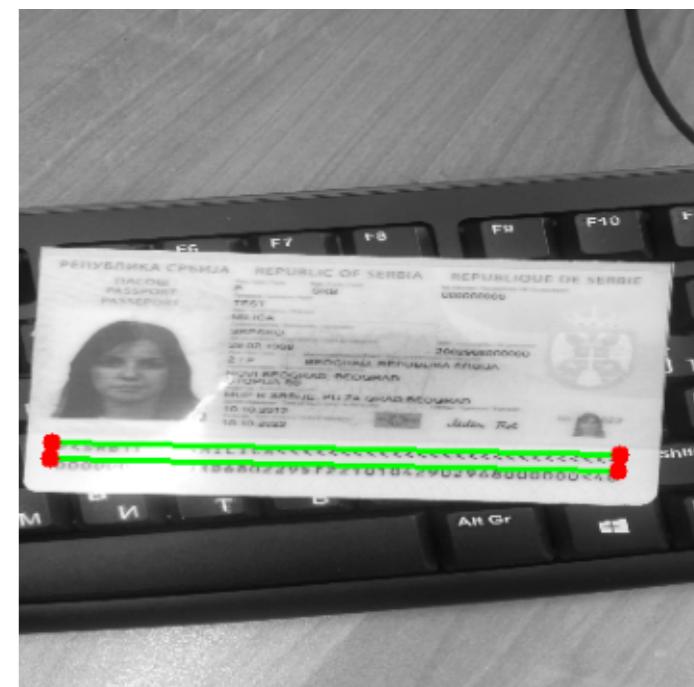
Probability Heatmap



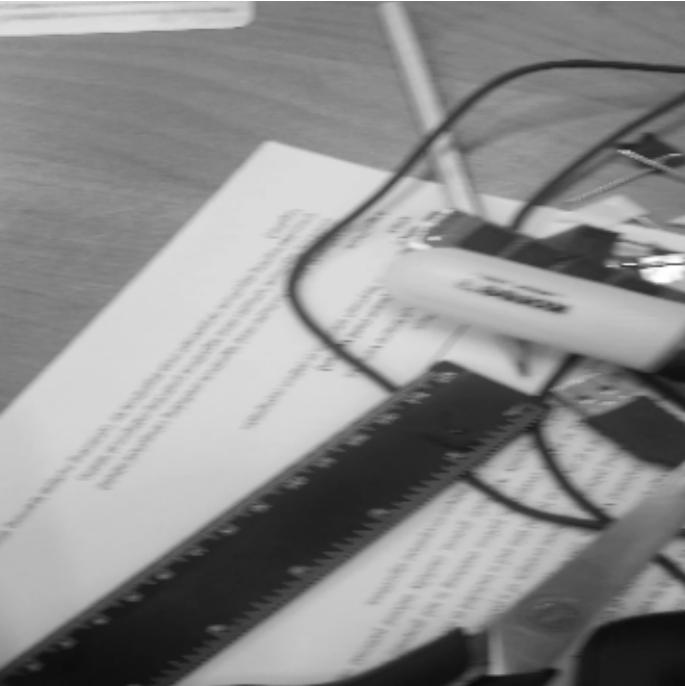
Mask Overlay



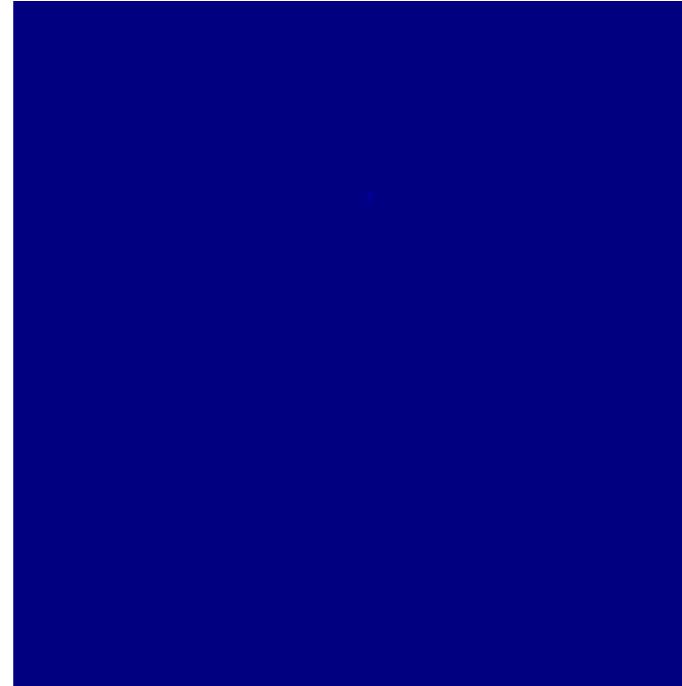
OBB Detection  
IoU: 0.823



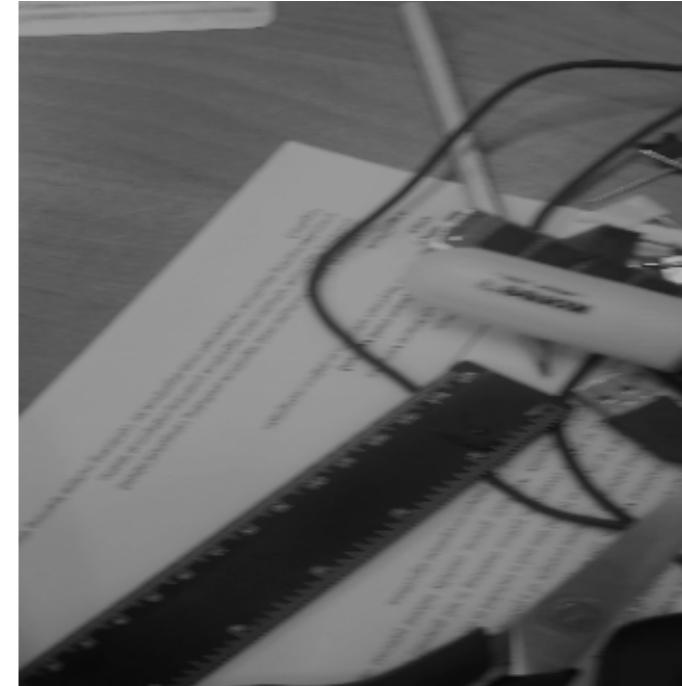
Original  
16\_deu\_passport\_new (unknown)



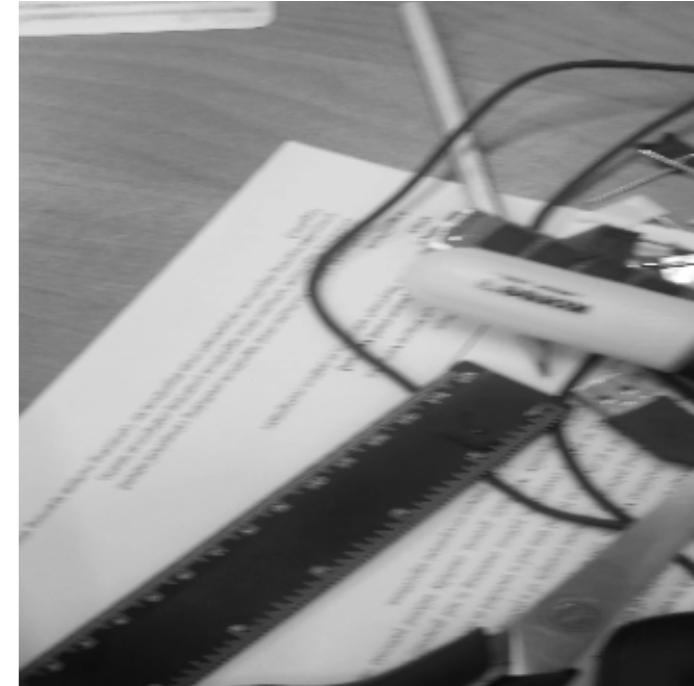
Probability Heatmap



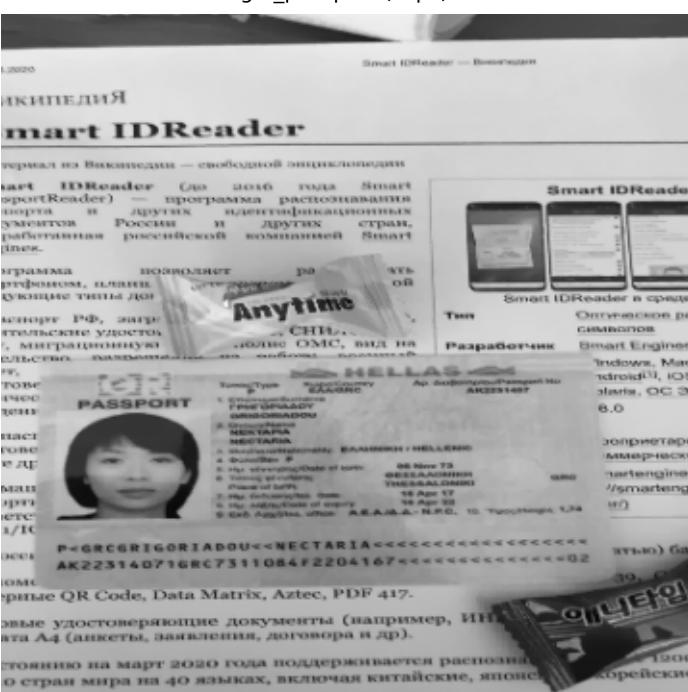
Mask Overlay



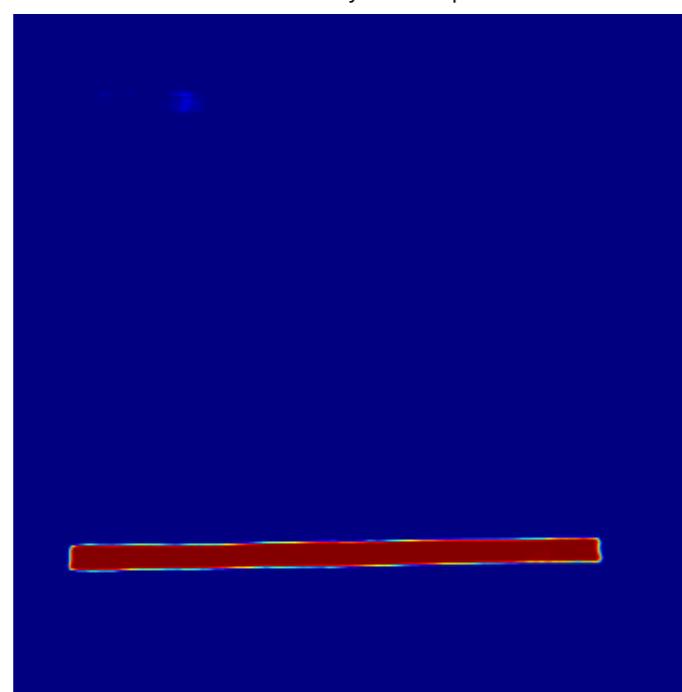
OBB Detection  
IoU: 0.000



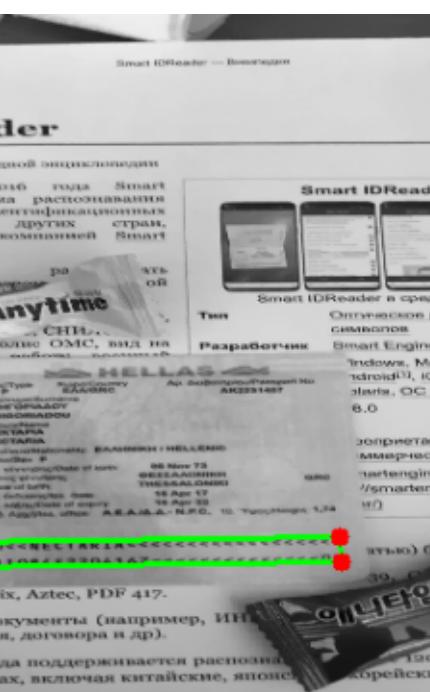
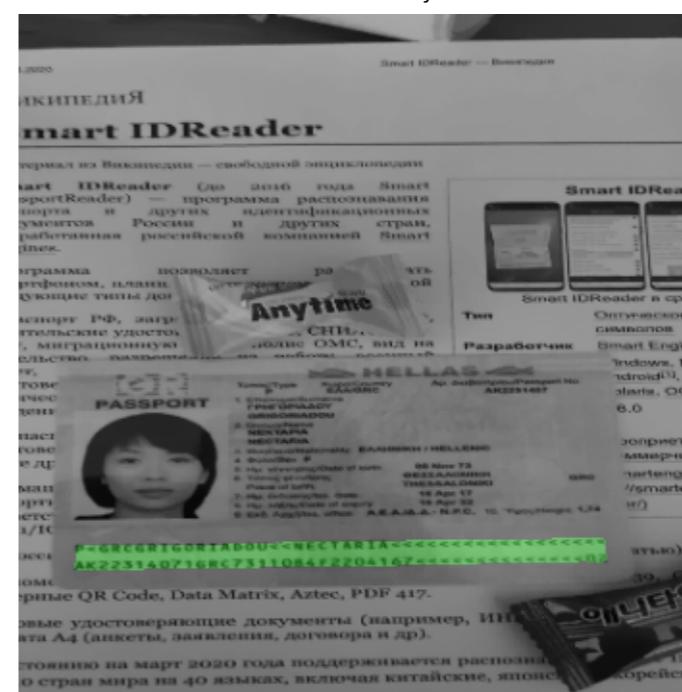
OBB Detection  
IoU: 0.956



Probability Heatmap



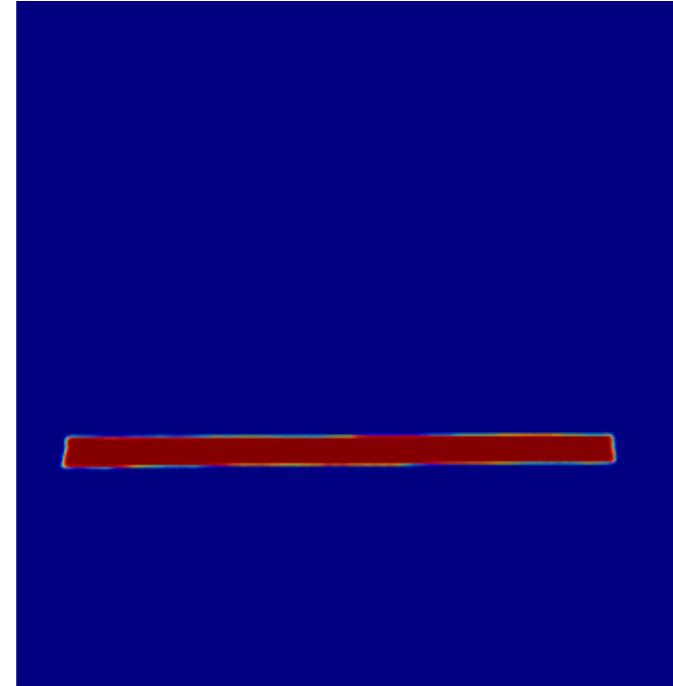
Mask Overlay



Original  
27\_hrv\_passport (unknown)



Probability Heatmap



Mask Overlay



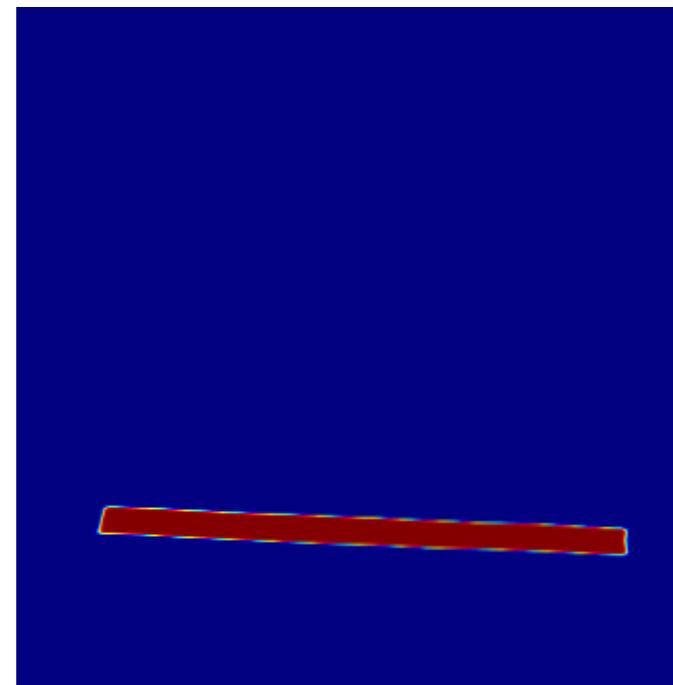
OBB Detection  
IoU: 0.937



Original  
16\_deu\_passport\_new (unknown)



Probability Heatmap



Mask Overlay



OBB Detection  
IoU: 0.974



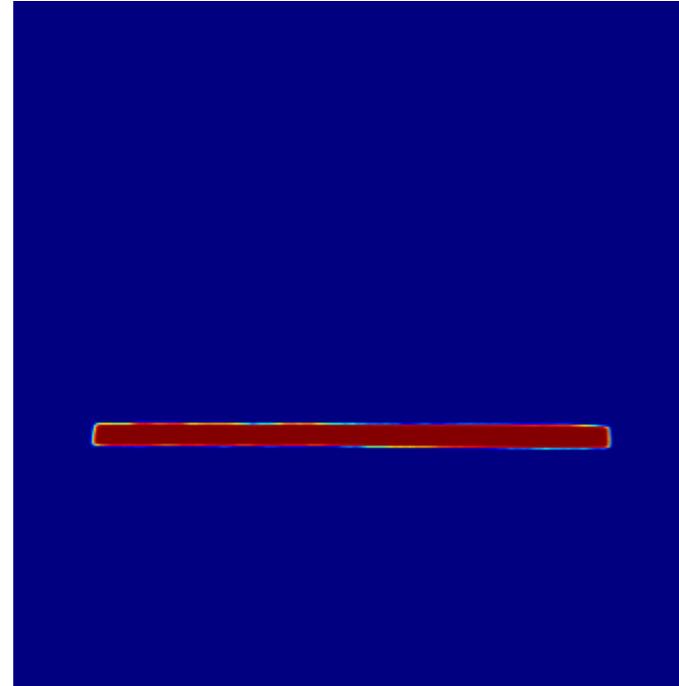
Original  
aze\_passport (photo)



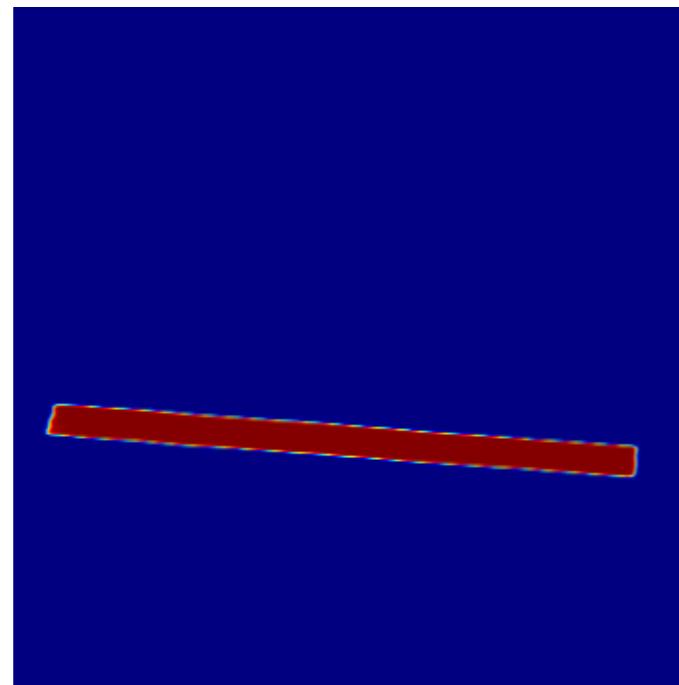
Original  
11\_cze\_passport (unknown)



Probability Heatmap



Probability Heatmap



Mask Overlay



Mask Overlay



OBB Detection  
IoU: 0.941



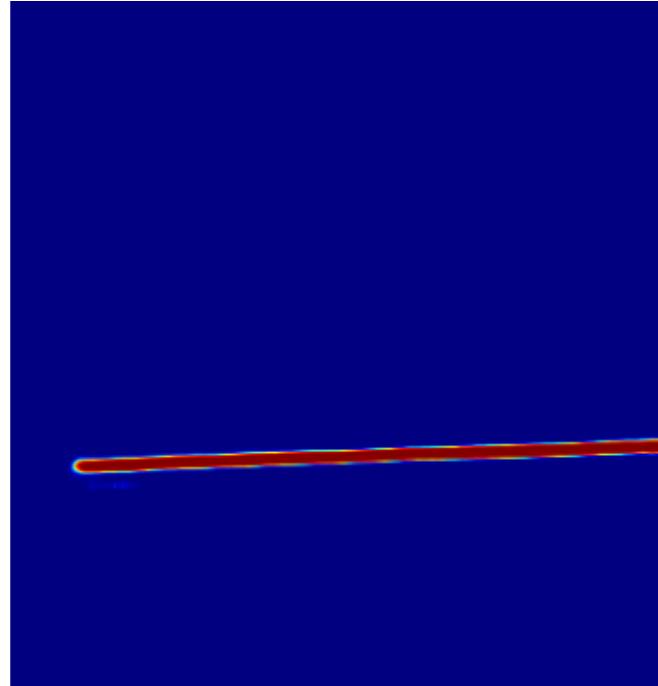
OBB Detection  
IoU: 0.967



Original  
34\_mda\_passport (unknown)



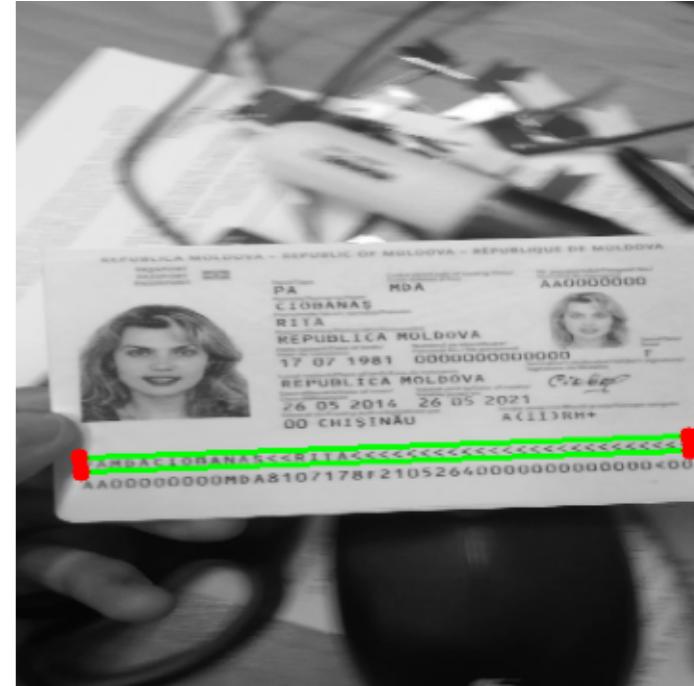
Probability Heatmap



Mask Overlay



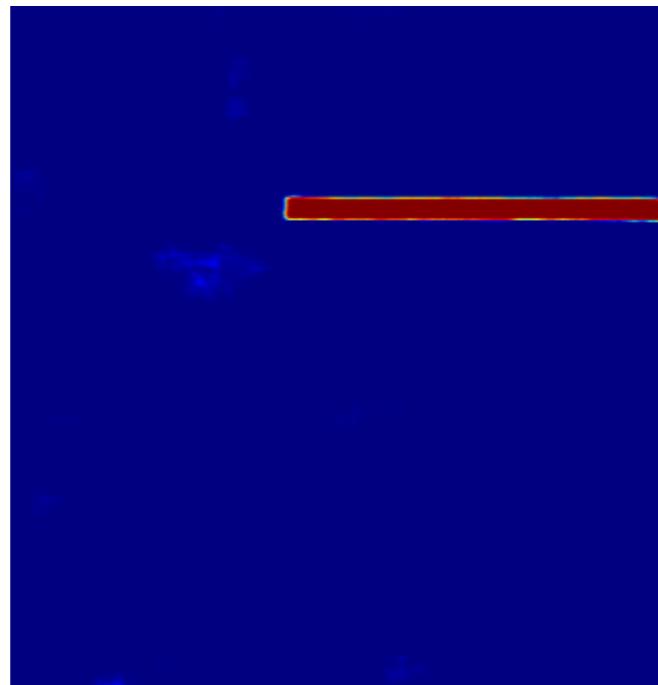
OBB Detection  
IoU: 0.807



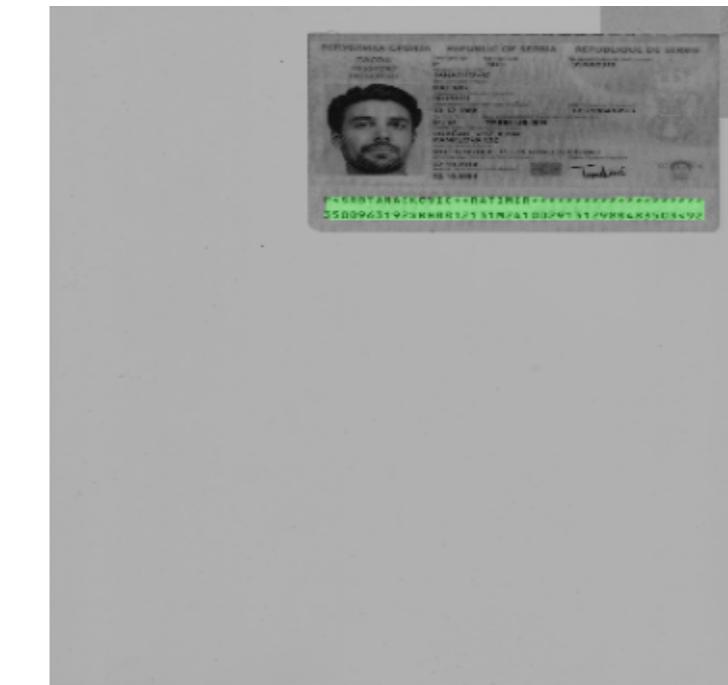
Original  
srb\_passport (scan\_upright)



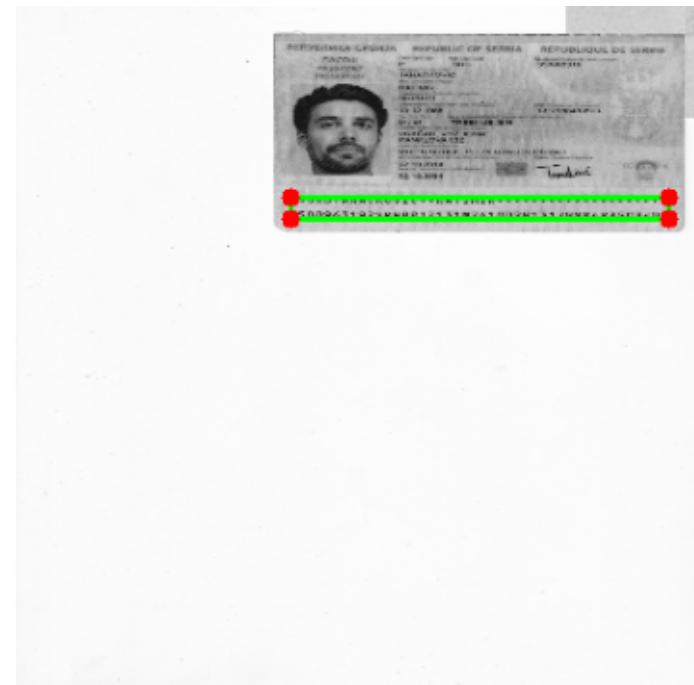
Probability Heatmap



Mask Overlay



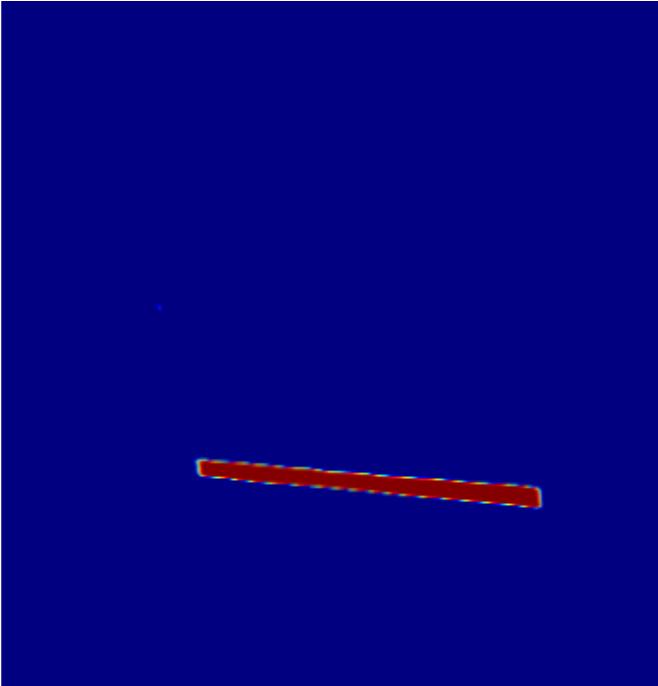
OBB Detection  
IoU: 0.928



Original  
aze\_passport (photo)



Probability Heatmap



Mask Overlay



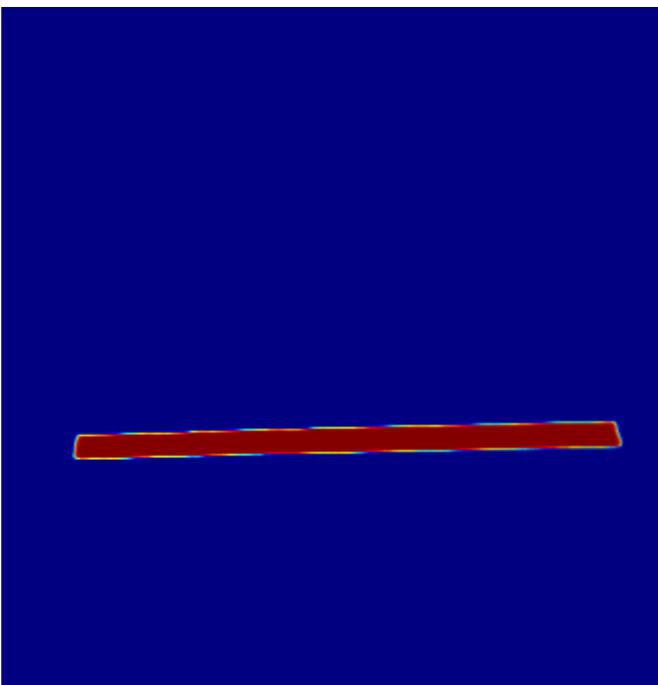
OBB Detection  
IoU: 0.955



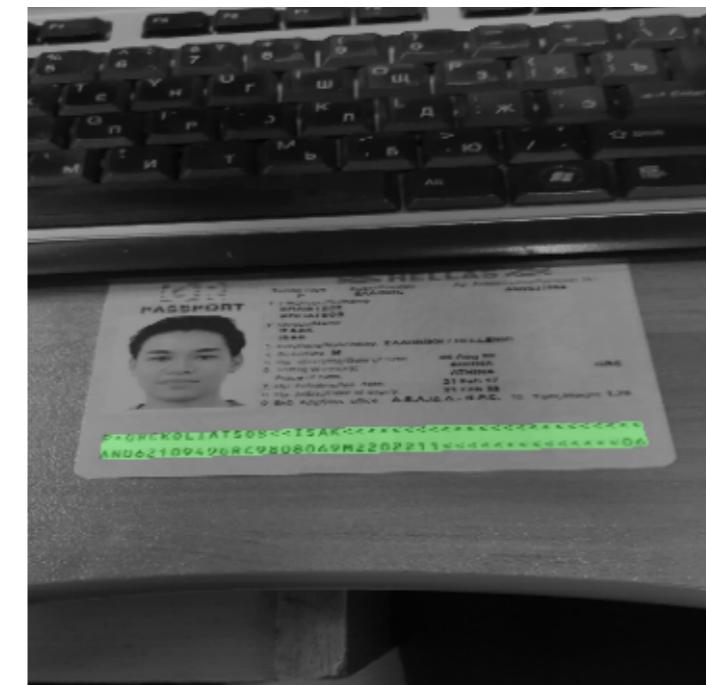
Original  
grc\_passport (clips)



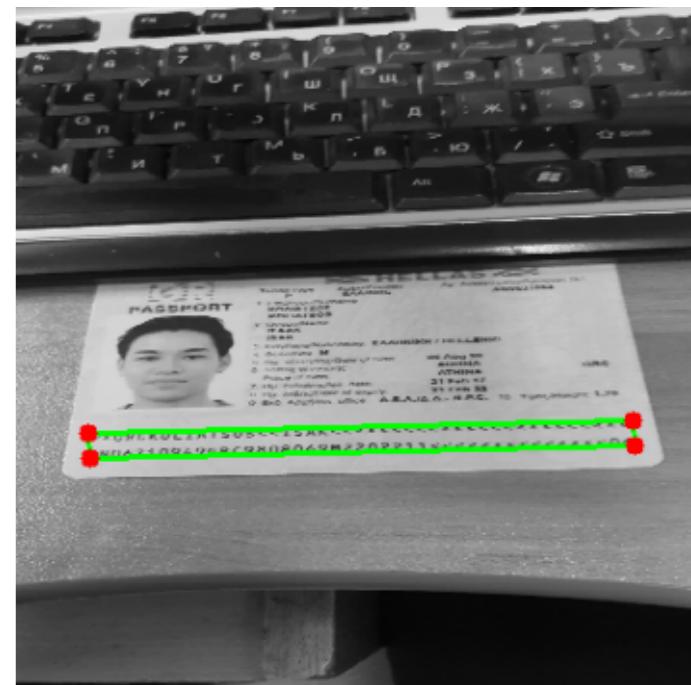
Probability Heatmap



Mask Overlay



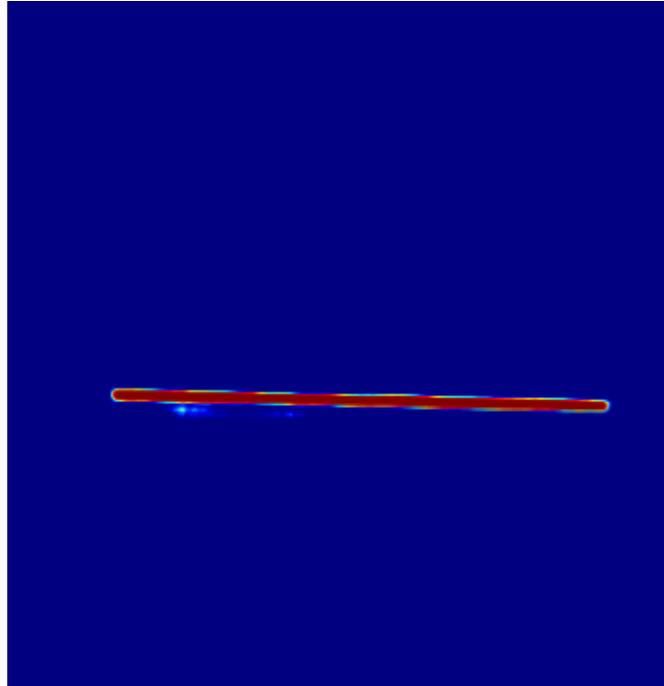
OBB Detection  
IoU: 0.893



Original  
34\_mda\_passport (unknown)



Probability Heatmap



Mask Overlay



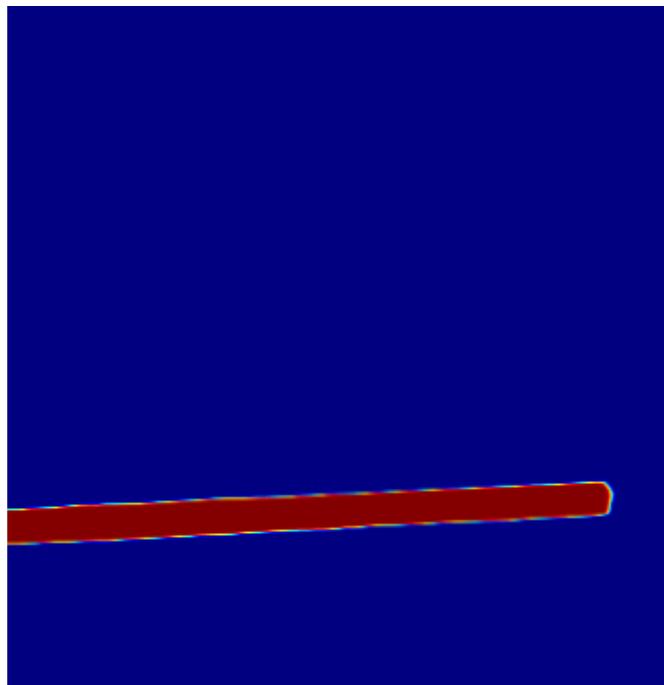
OBB Detection  
IoU: 0.927



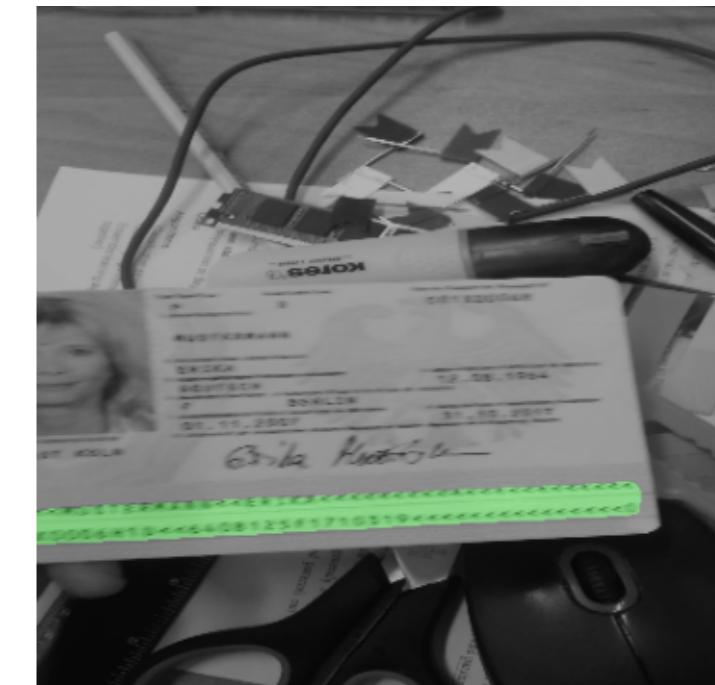
Original  
17\_deu\_passport\_old (unknown)



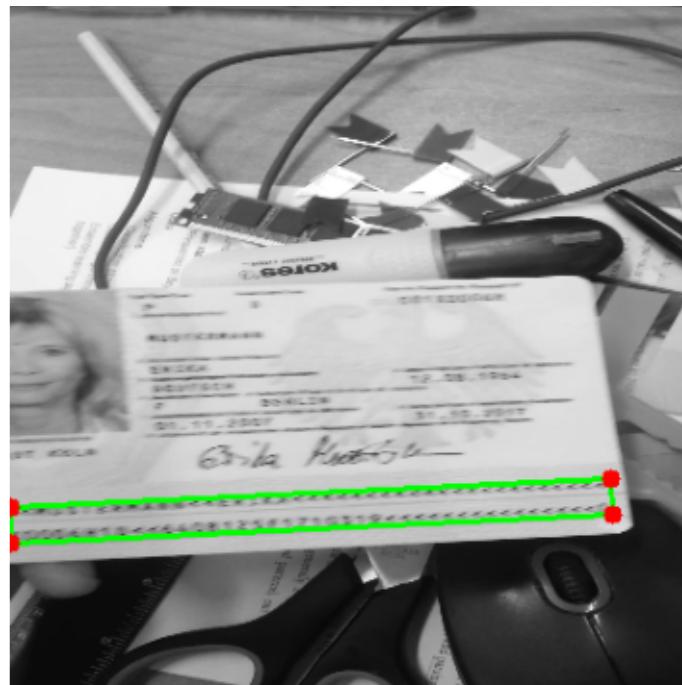
Probability Heatmap



Mask Overlay



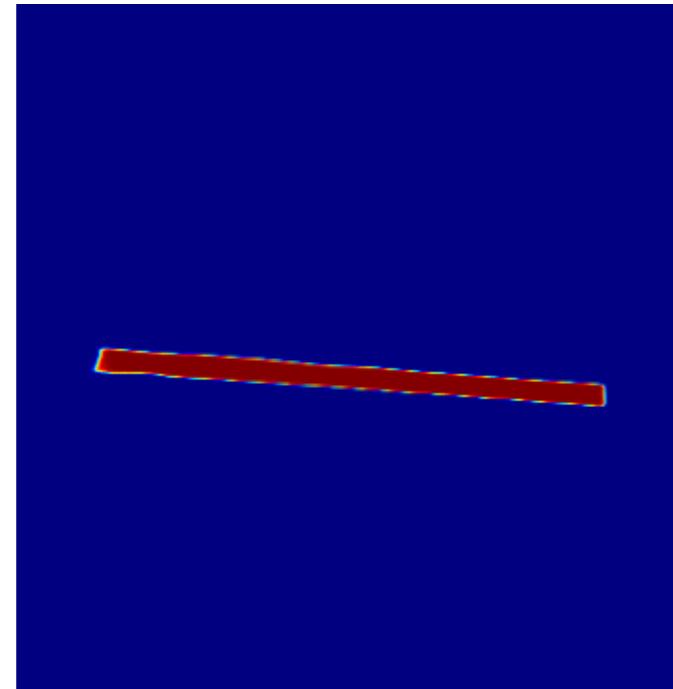
OBB Detection  
IoU: 0.955



Original  
aze\_passport (clips)



Probability Heatmap



Mask Overlay



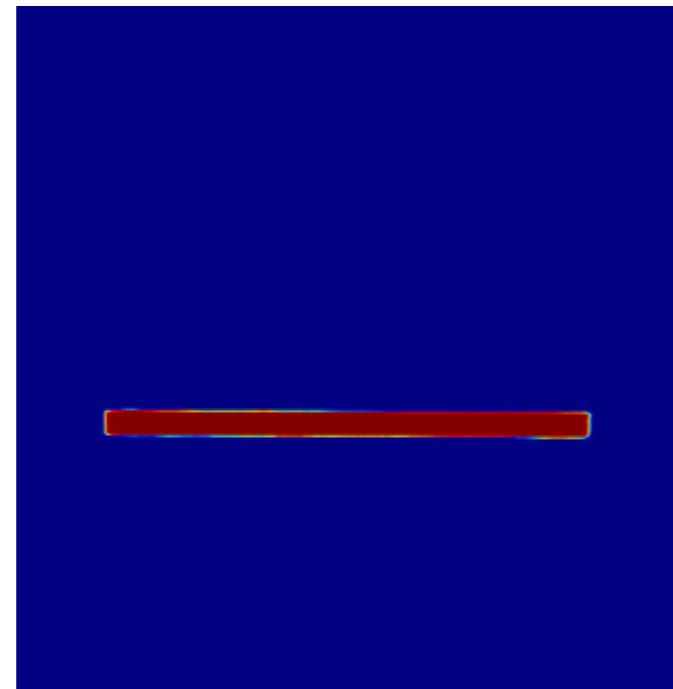
OBB Detection  
IoU: 0.948



Original  
11\_cze\_passport (unknown)



Probability Heatmap



Mask Overlay



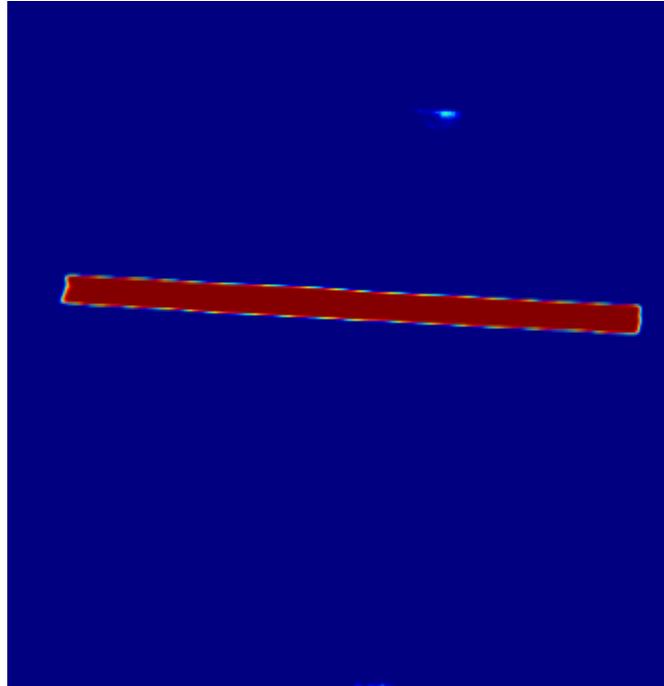
OBB Detection  
IoU: 0.971



Original  
11\_cze\_passport (unknown)



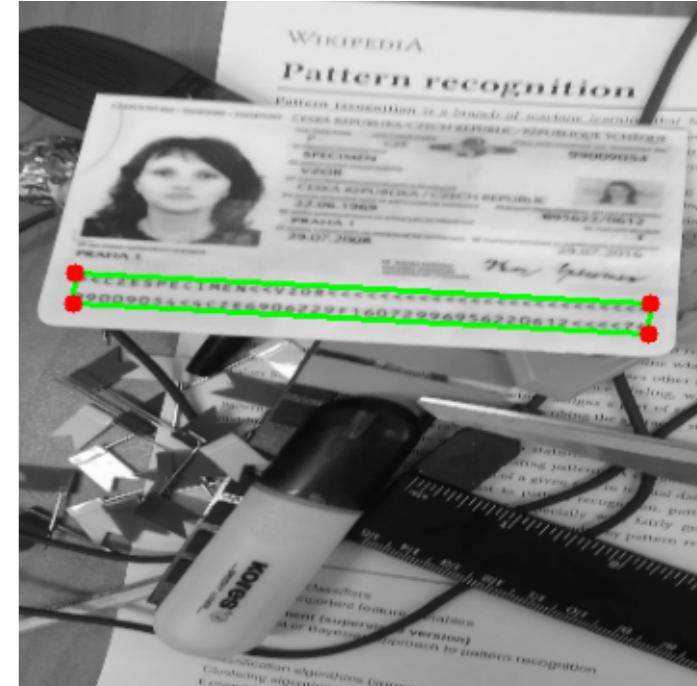
Probability Heatmap



Mask Overlay



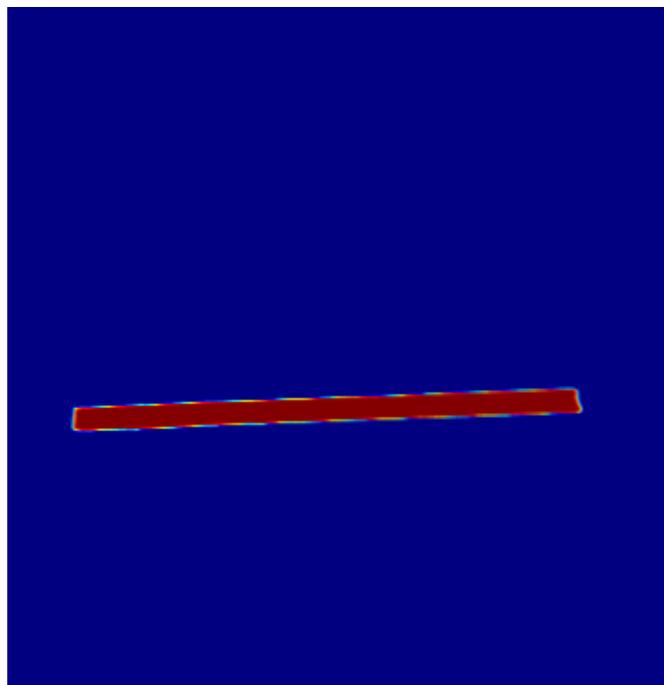
OBB Detection  
IoU: 0.974



Original  
srб\_passport (clips)



Probability Heatmap



Mask Overlay



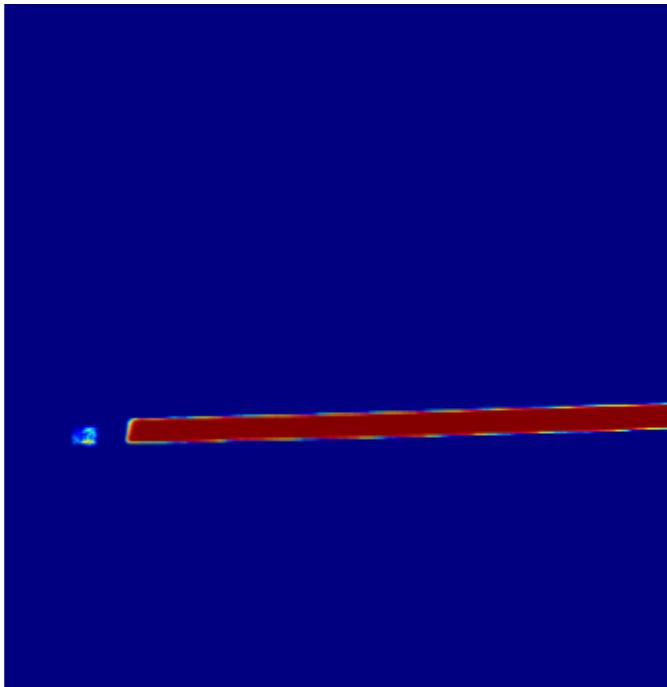
OBB Detection  
IoU: 0.959



Original  
lva\_passport (clips)



Probability Heatmap



Mask Overlay



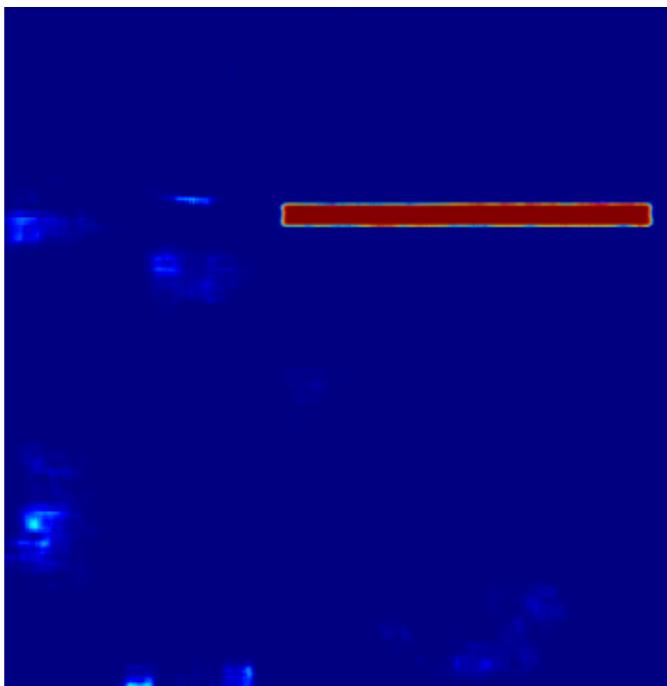
OBB Detection  
IoU: 0.949



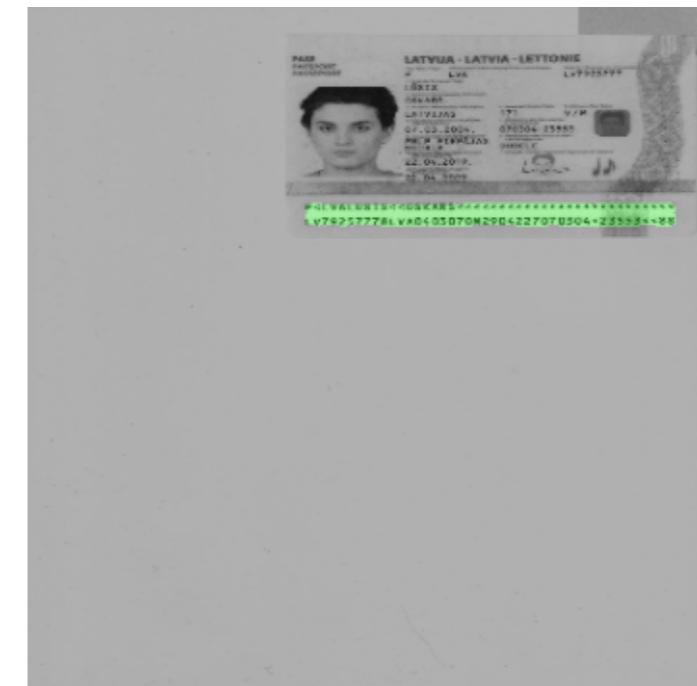
Original  
lva\_passport (scan\_upright)



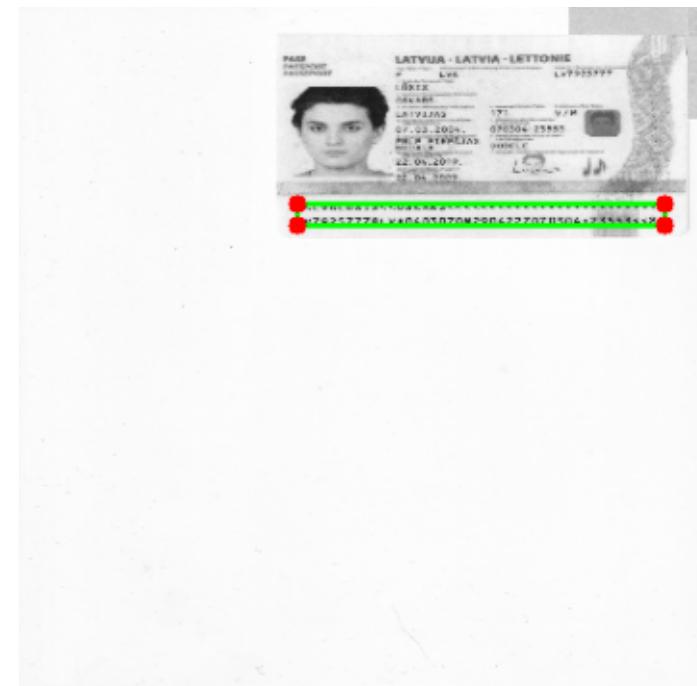
Probability Heatmap



Mask Overlay



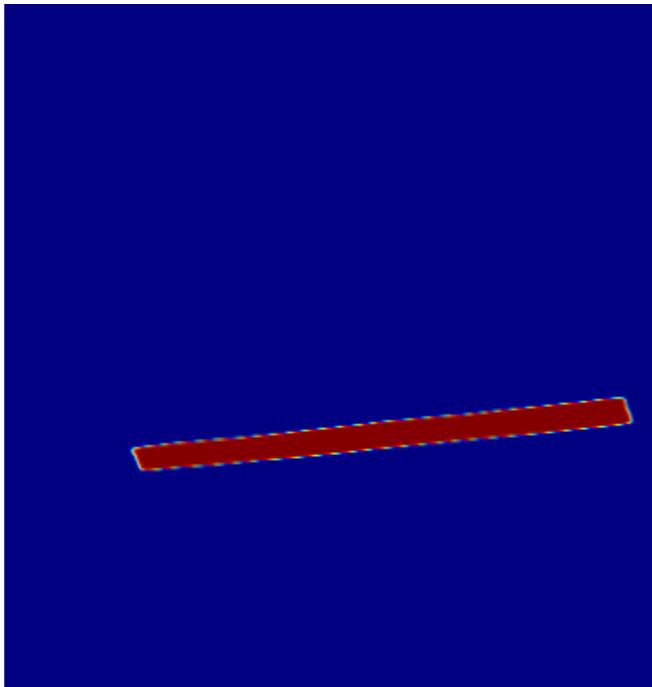
OBB Detection  
IoU: 0.906



Original  
16\_deu\_passport\_new (unknown)



Probability Heatmap



Mask Overlay



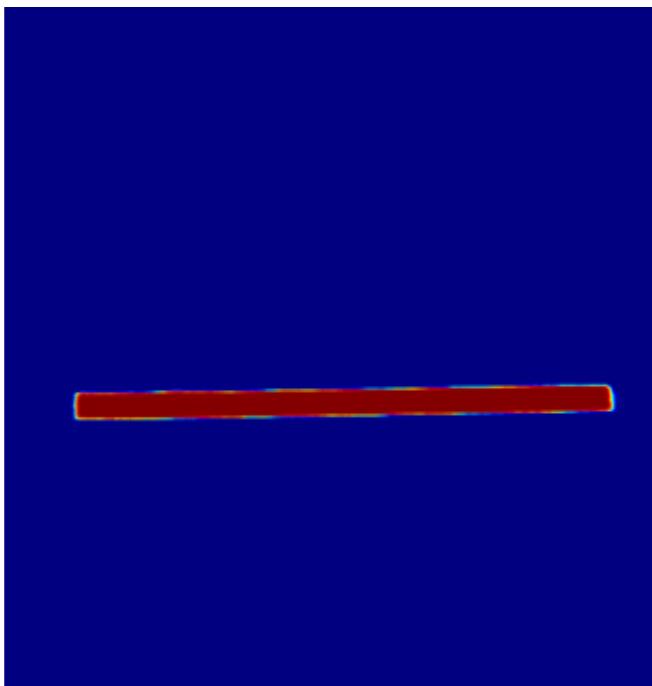
OBB Detection  
IoU: 0.972



Original  
17\_deu\_passport\_old (unknown)



Probability Heatmap



Mask Overlay



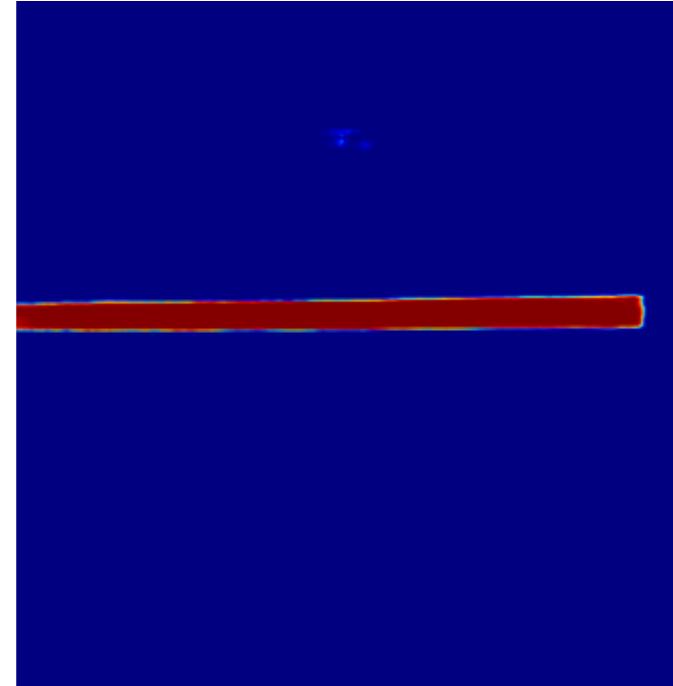
OBB Detection  
IoU: 0.968



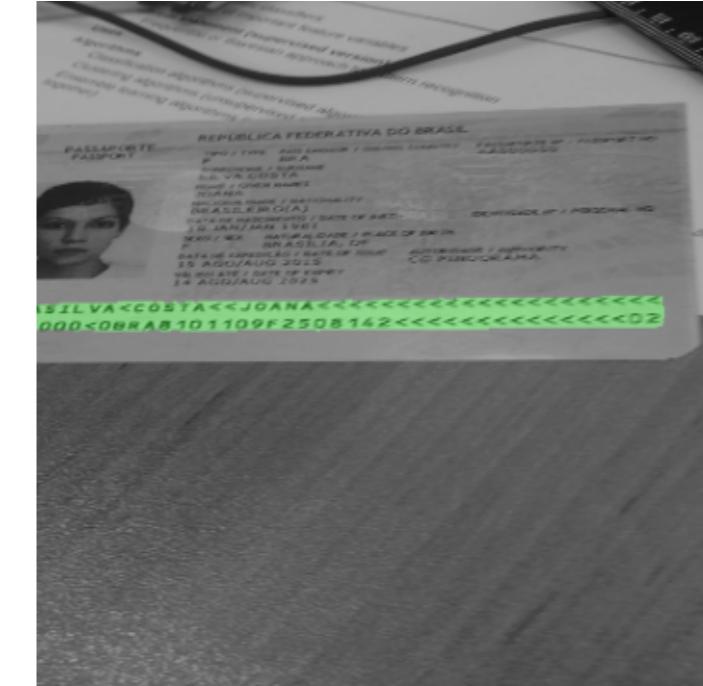
Original  
06\_bra\_passport (unknown)



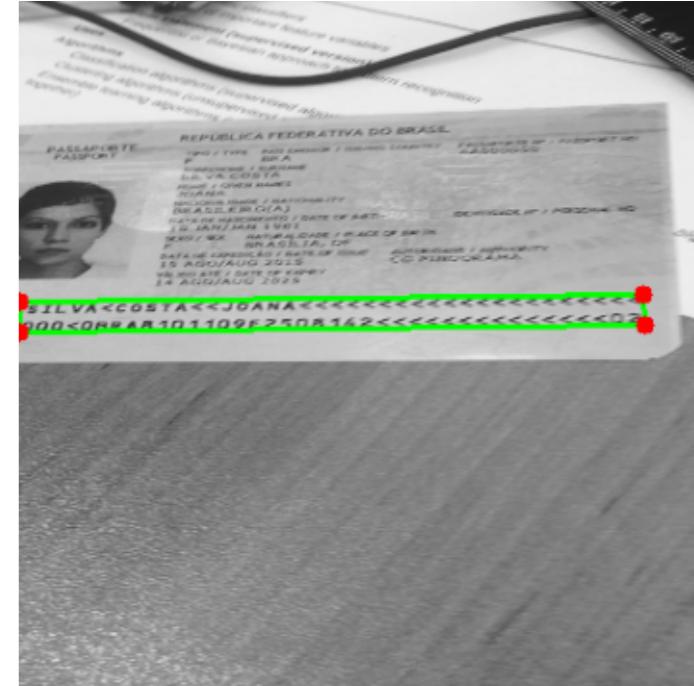
Probability Heatmap



Mask Overlay



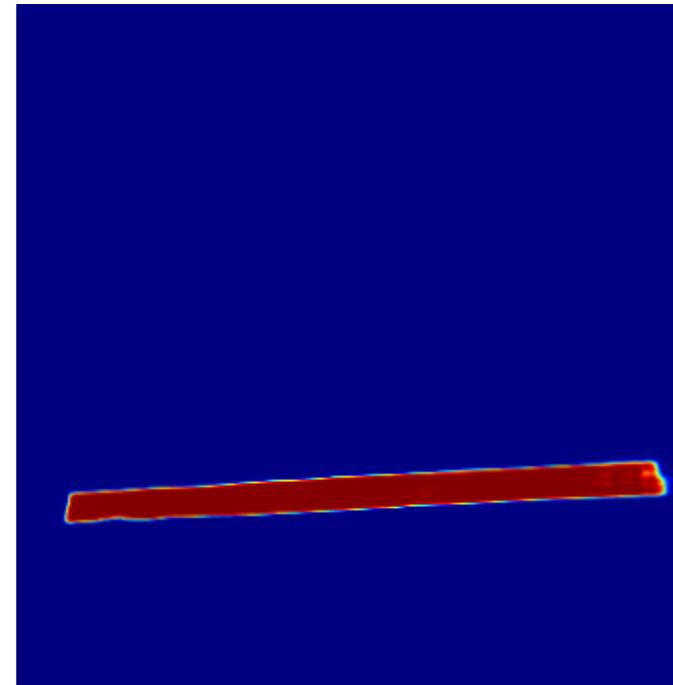
OBB Detection  
IoU: 0.840



Original  
27\_hrv\_passport (unknown)



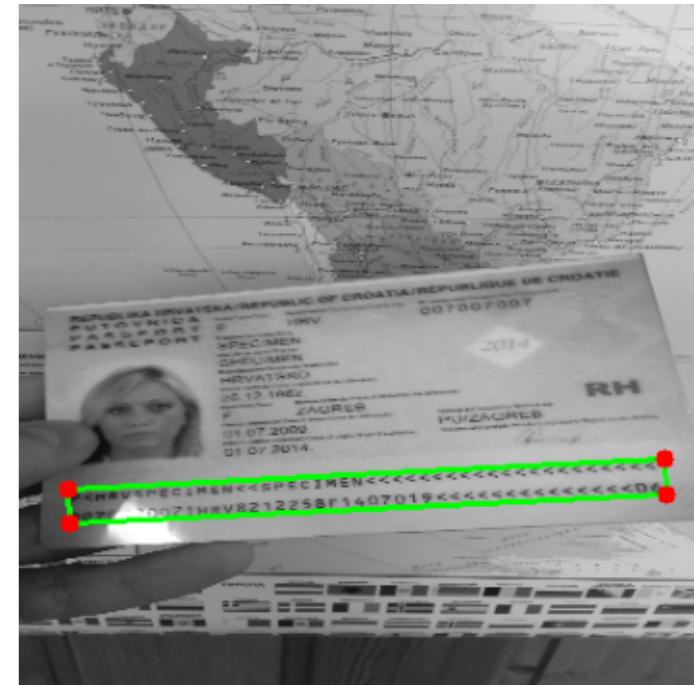
Probability Heatmap



Mask Overlay



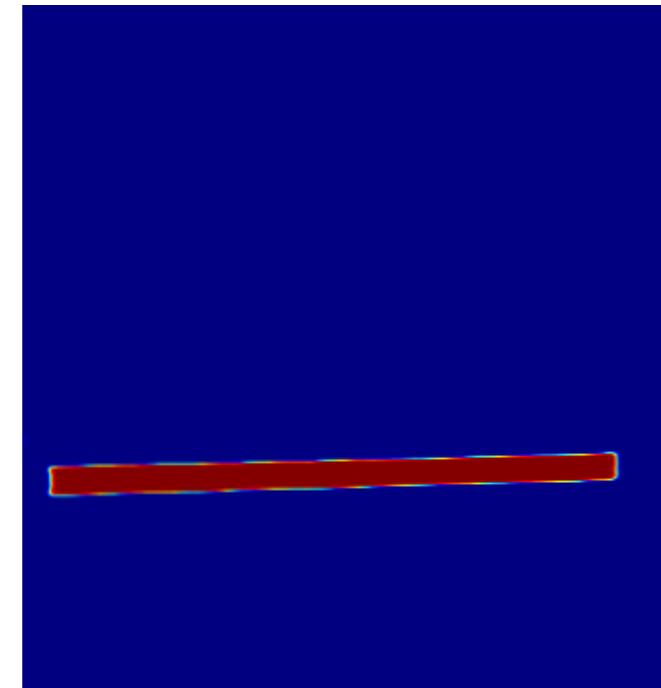
OBB Detection  
IoU: 0.954



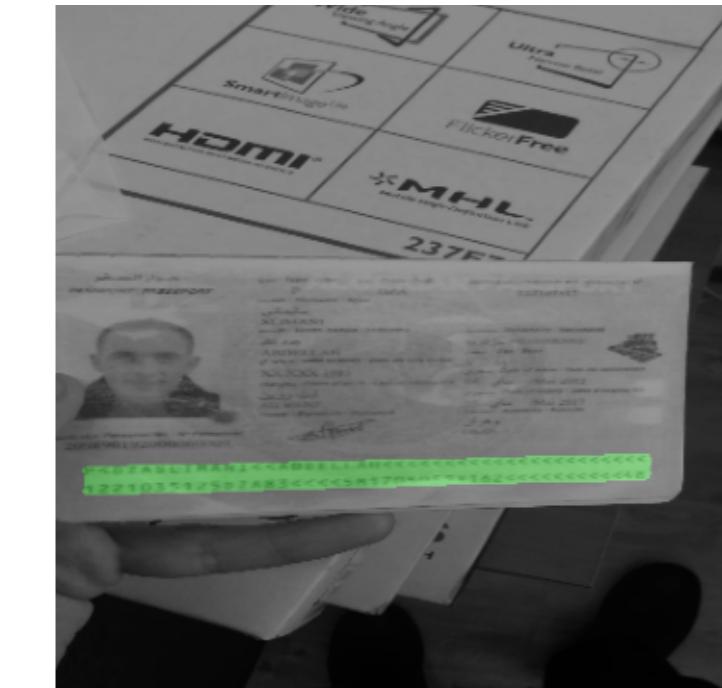
Original  
18\_dza\_passport (unknown)



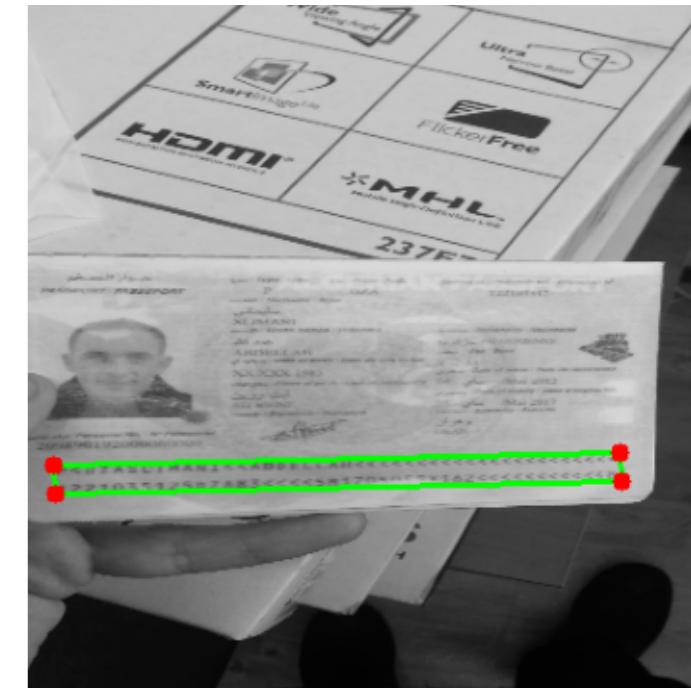
Probability Heatmap



Mask Overlay



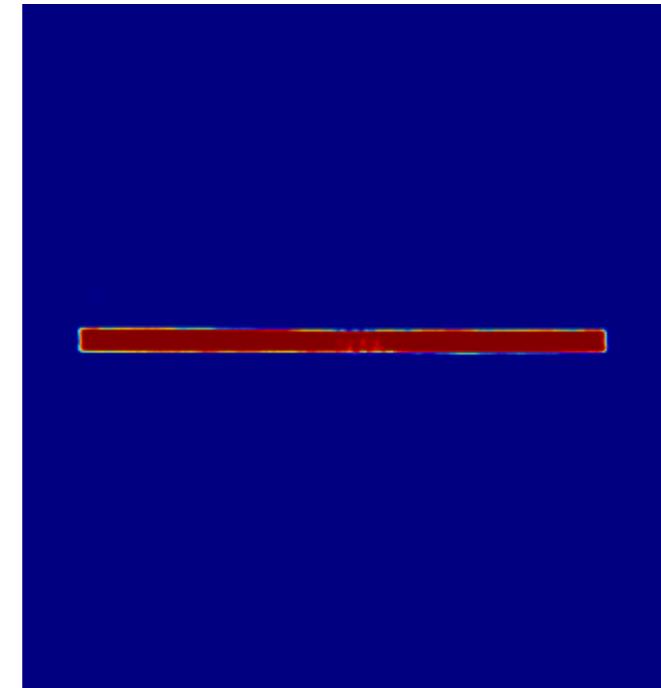
OBB Detection  
IoU: 0.973



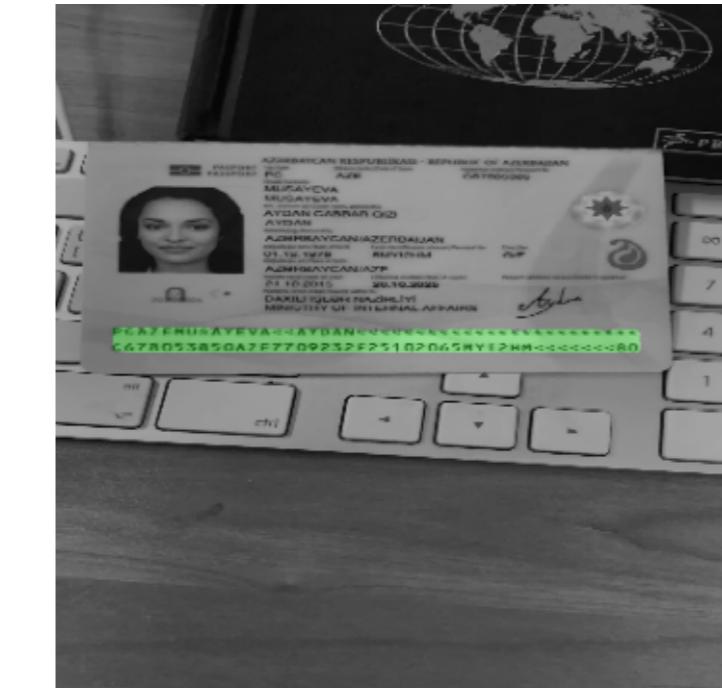
Original  
aze\_passport (clips)



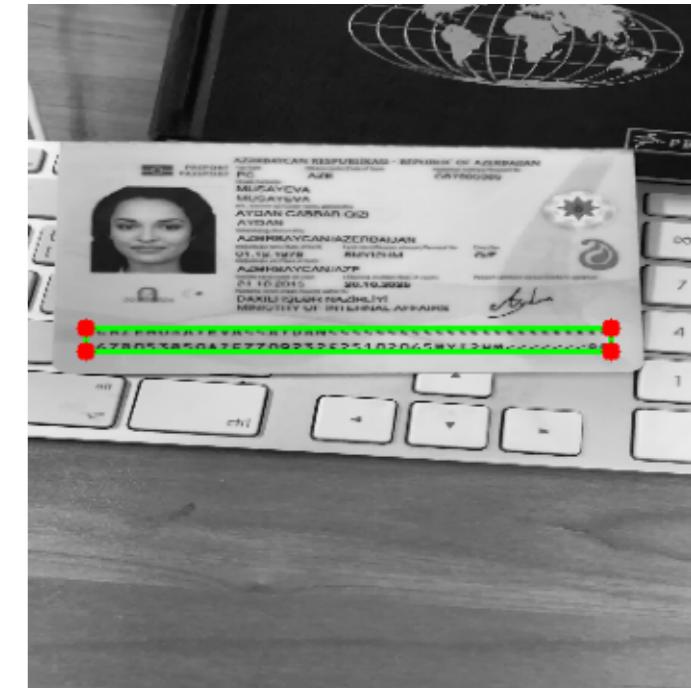
Probability Heatmap



Mask Overlay



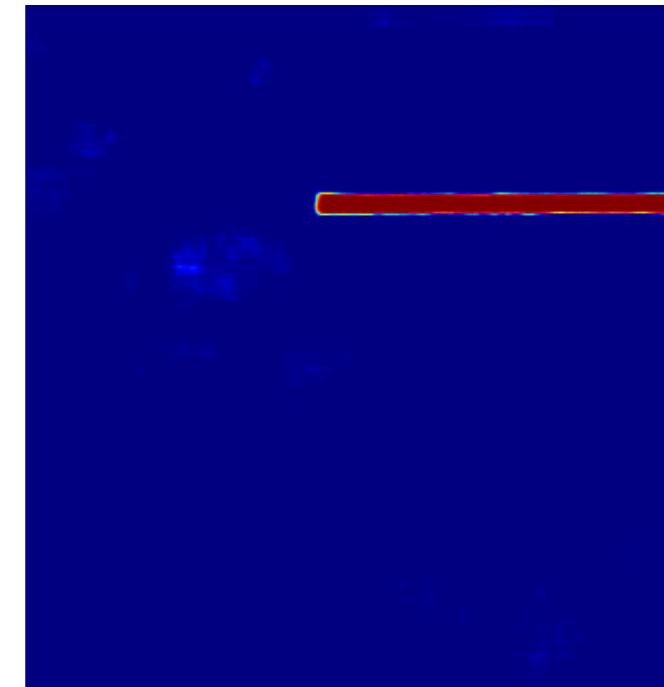
OBB Detection  
IoU: 0.969



Original  
grc\_passport (scan\_upright)



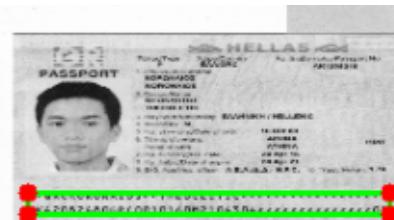
Probability Heatmap



Mask Overlay



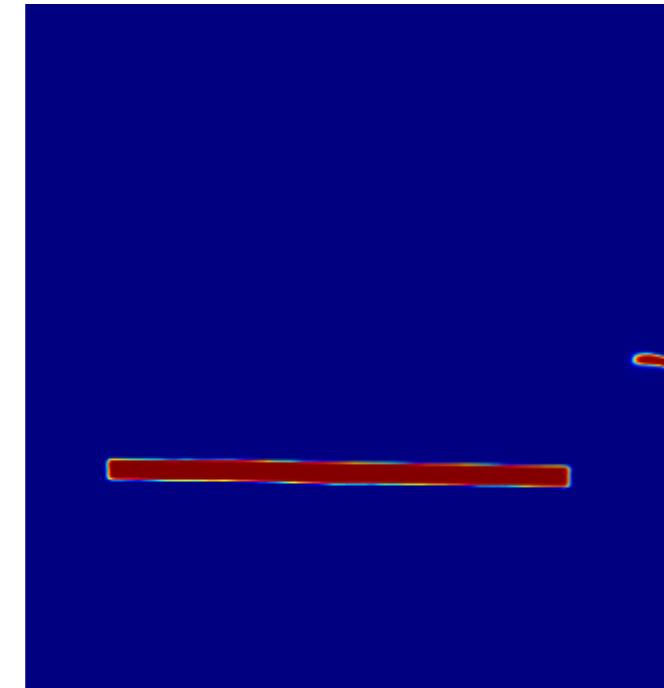
OBB Detection  
IoU: 0.968



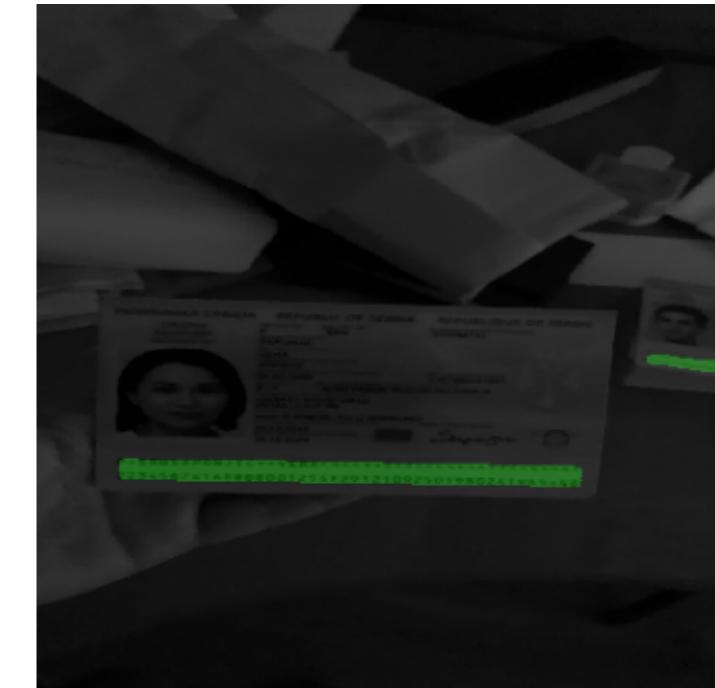
Original  
srb\_passport (clips)



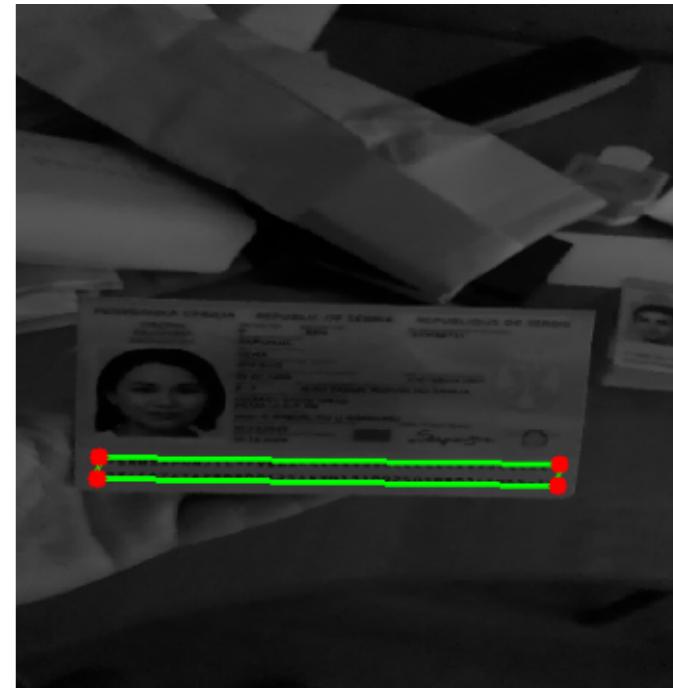
Probability Heatmap



Mask Overlay



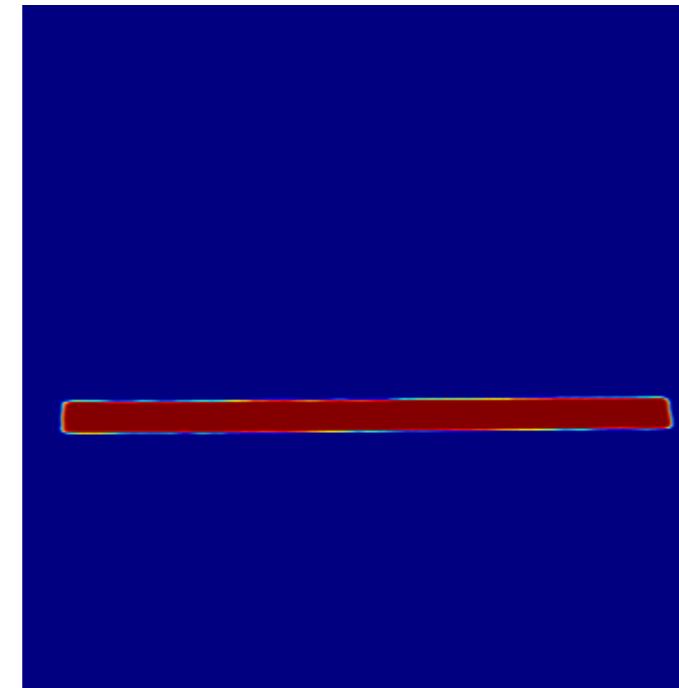
OBB Detection  
IoU: 0.836



Original  
45\_ukr\_passport (unknown)



Probability Heatmap



Mask Overlay



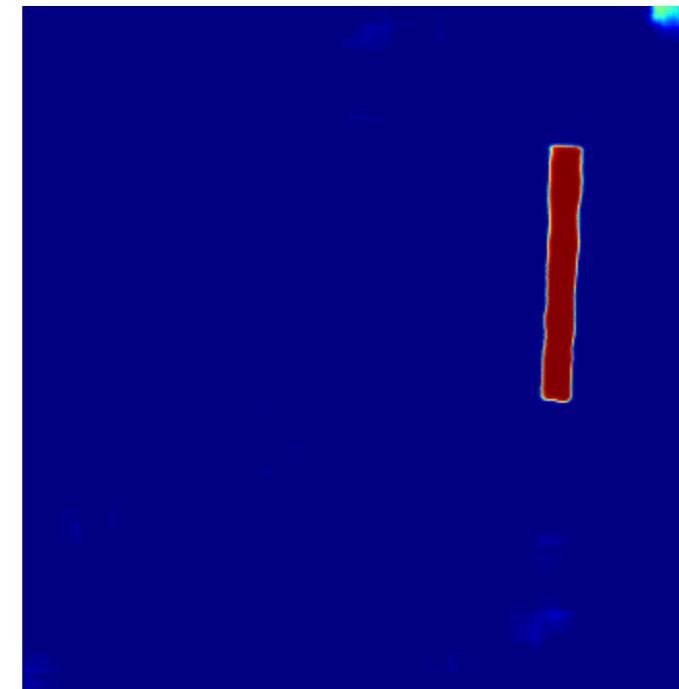
OBB Detection  
IoU: 0.933



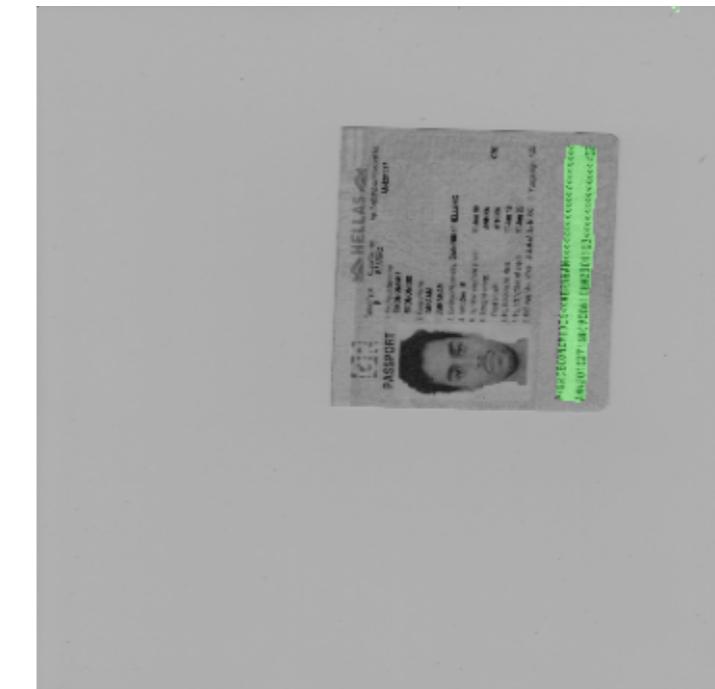
Original  
grc\_passport (scan\_rotated)



Probability Heatmap



Mask Overlay



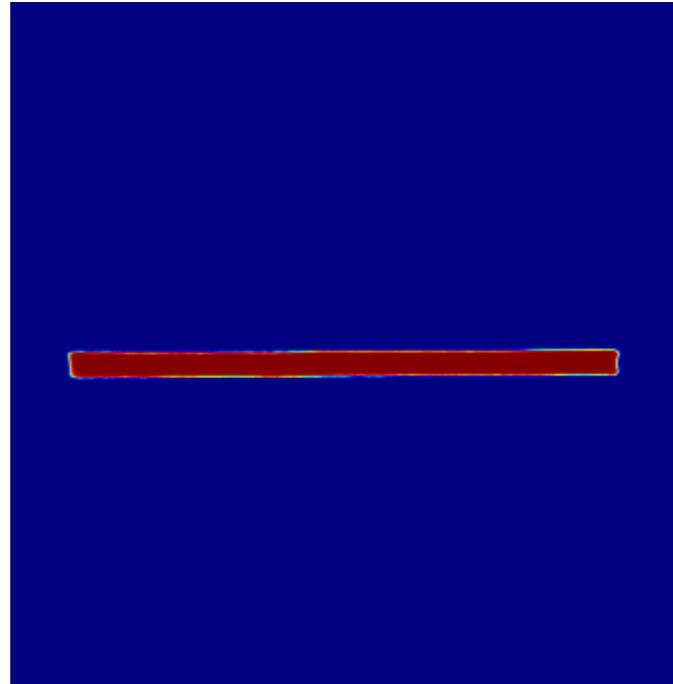
OBB Detection  
IoU: 0.933



Original  
lva\_passport (clips)



Probability Heatmap



Mask Overlay



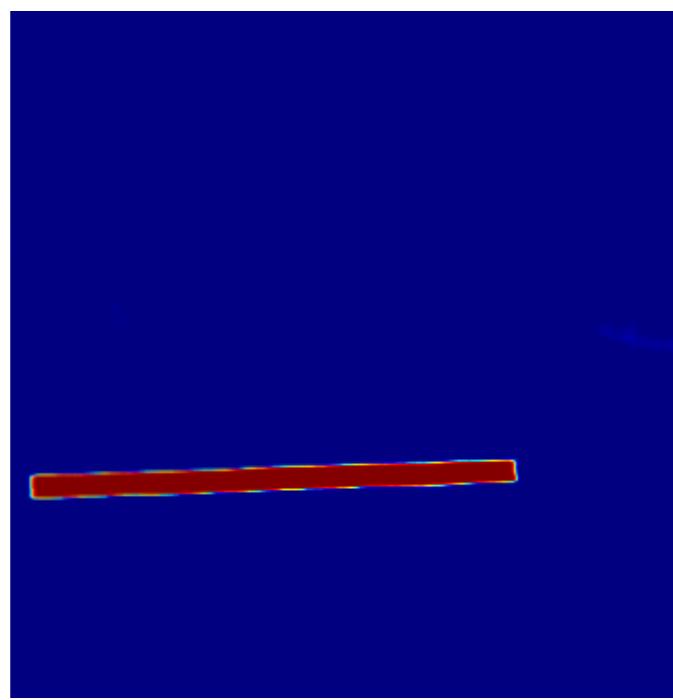
OBB Detection  
IoU: 0.935



Original  
lva\_passport (clips)



Probability Heatmap



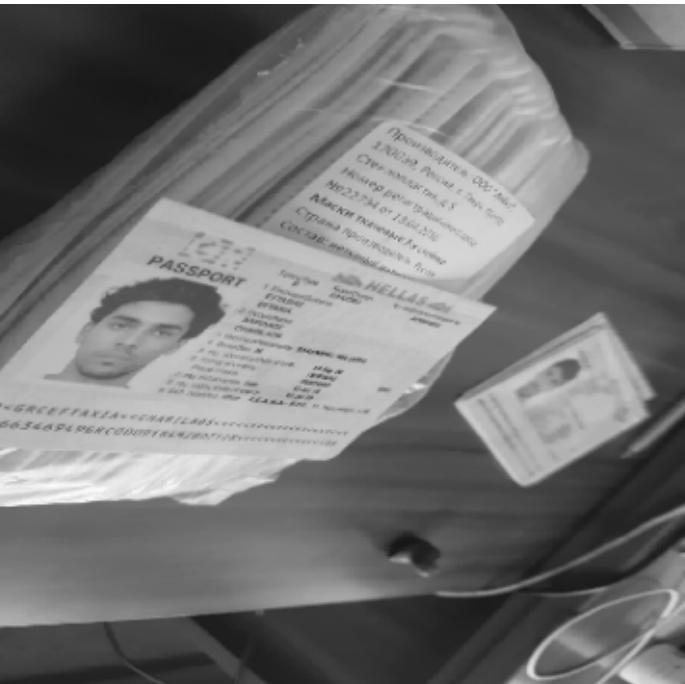
Mask Overlay



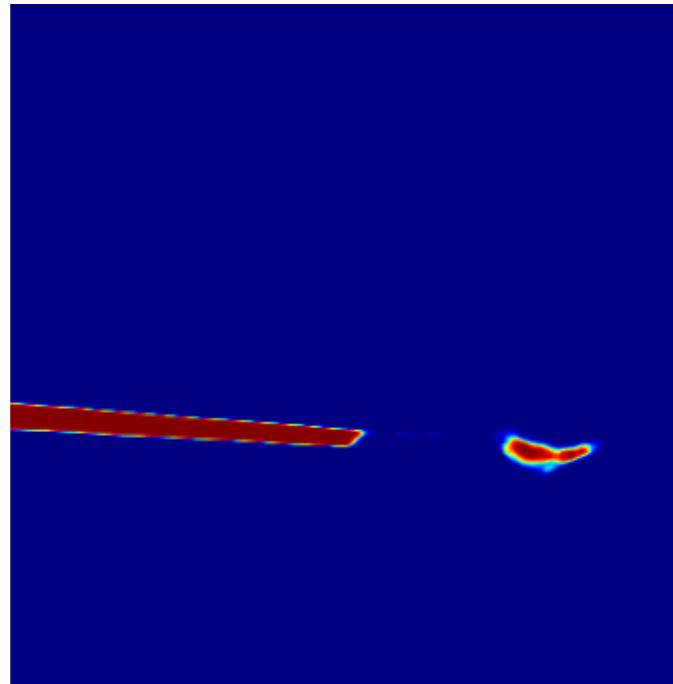
OBB Detection  
IoU: 0.927



Original  
grc\_passport (clips)



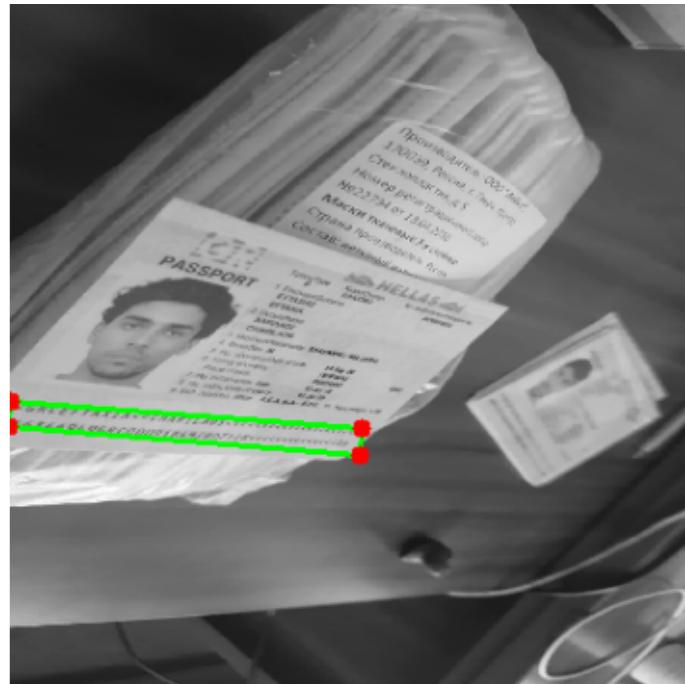
Probability Heatmap



Mask Overlay



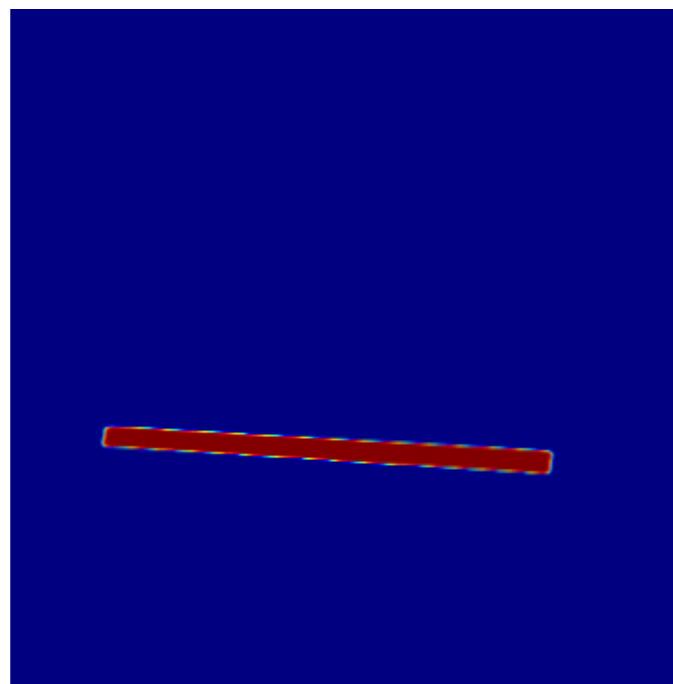
OBB Detection  
IoU: 0.792



Original  
lva\_passport (clips)



Probability Heatmap



Mask Overlay



OBB Detection  
IoU: 0.960



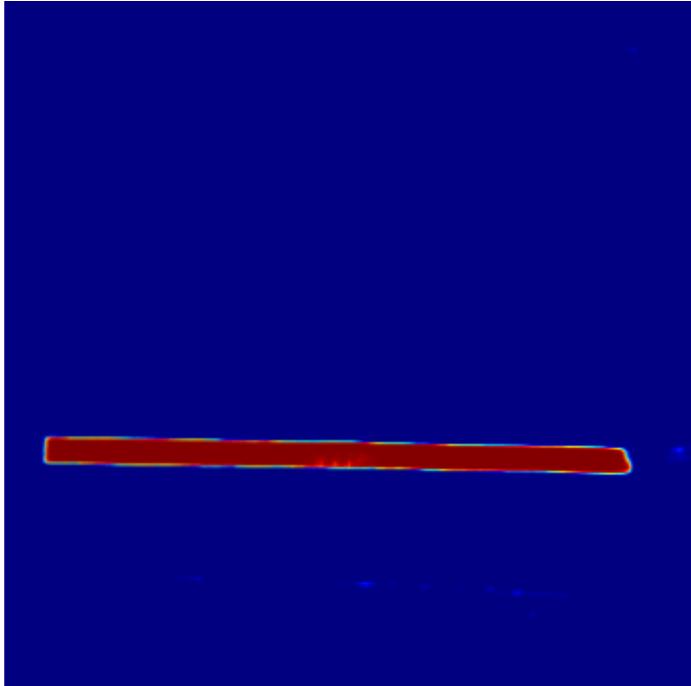
Original  
aze\_passport (clips)



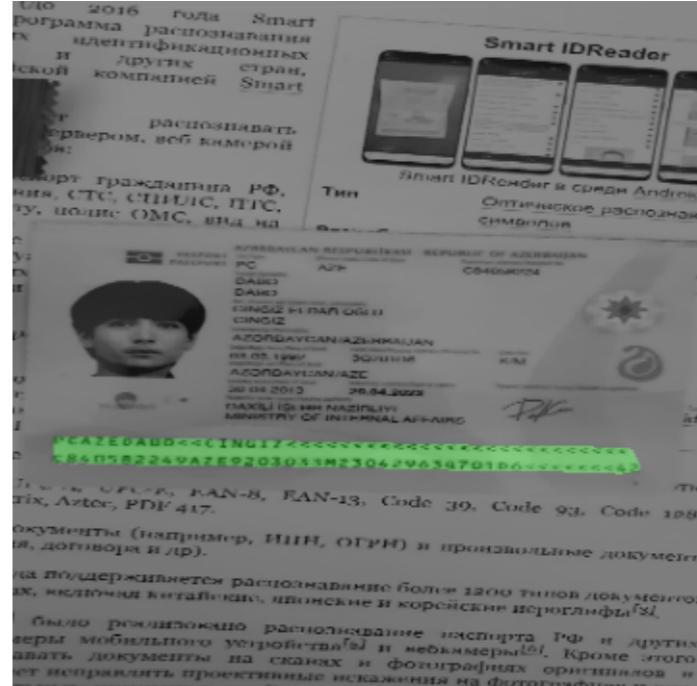
Original  
aze\_passport (clips)



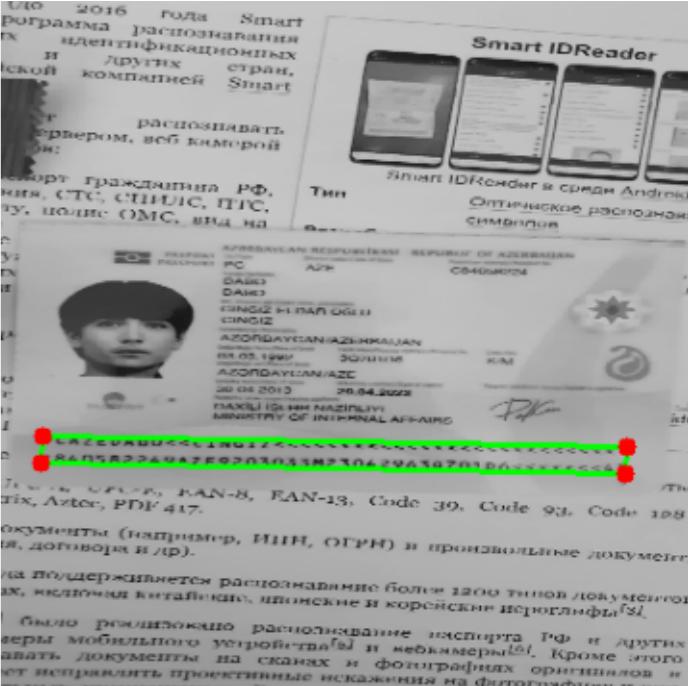
Probability Heatmap



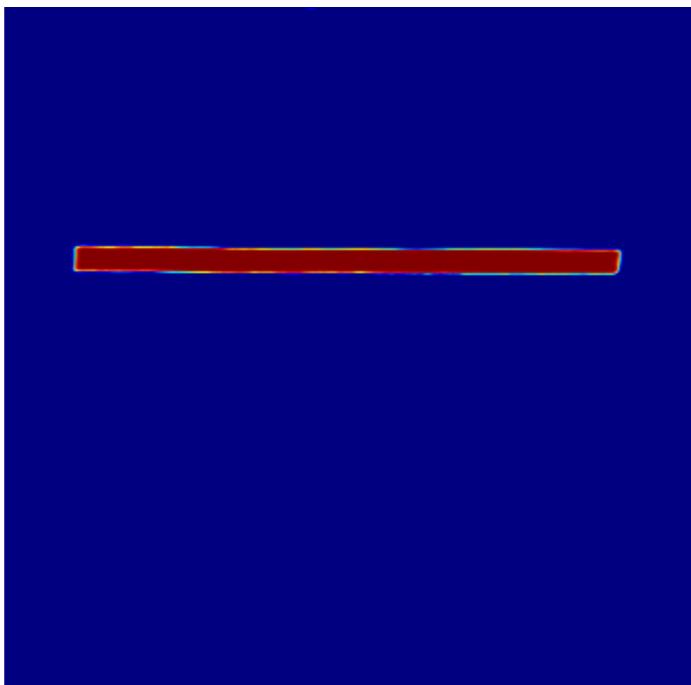
Mask Overlay



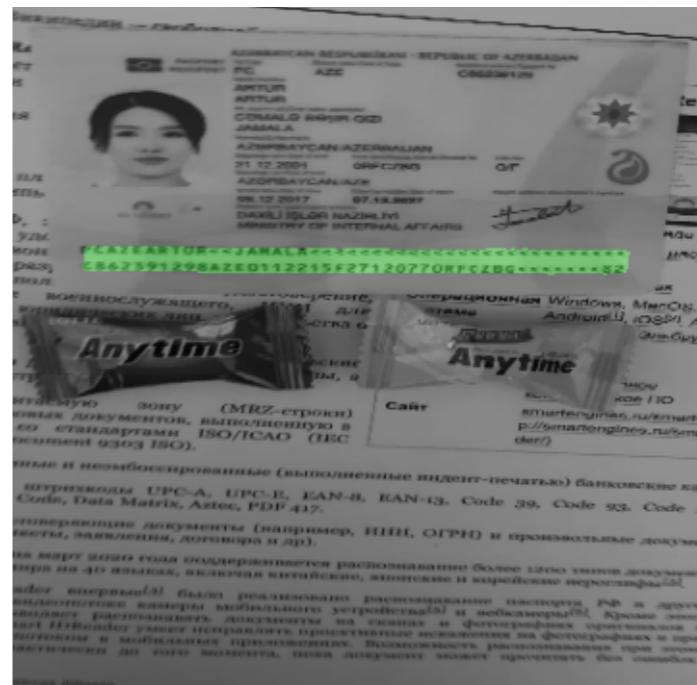
OBB Detection  
IoU: 0.958



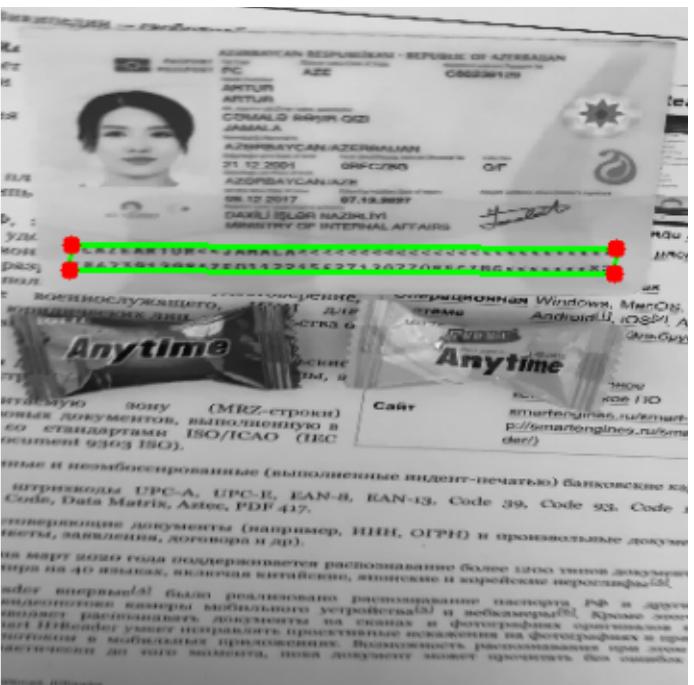
Probability Heatmap



Mask Overlay



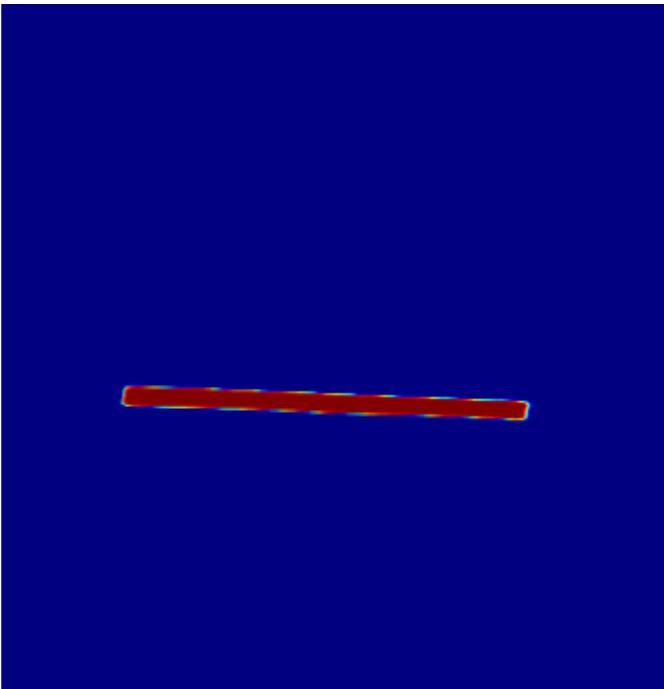
OBB Detection  
IoU: 0.966



Original  
grc\_passport (clips)



Probability Heatmap



Mask Overlay



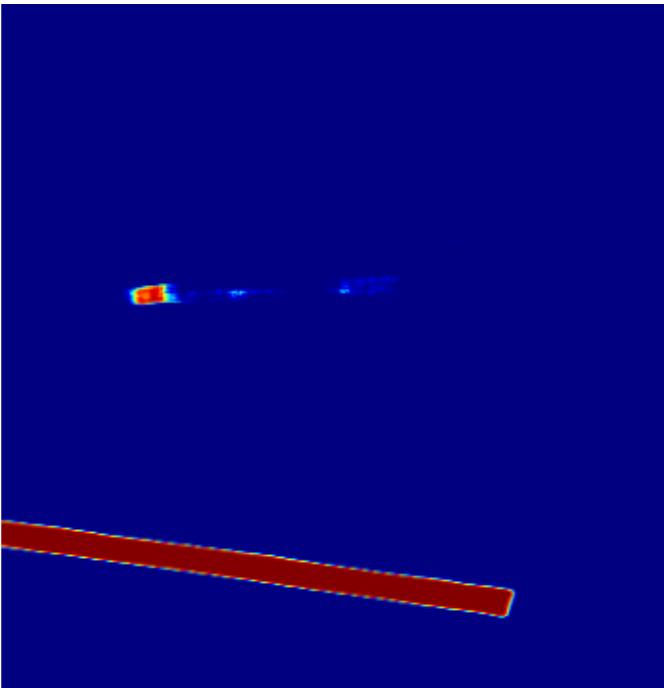
OBB Detection  
IoU: 0.945



Original  
lva\_passport (clips)



Probability Heatmap



Mask Overlay



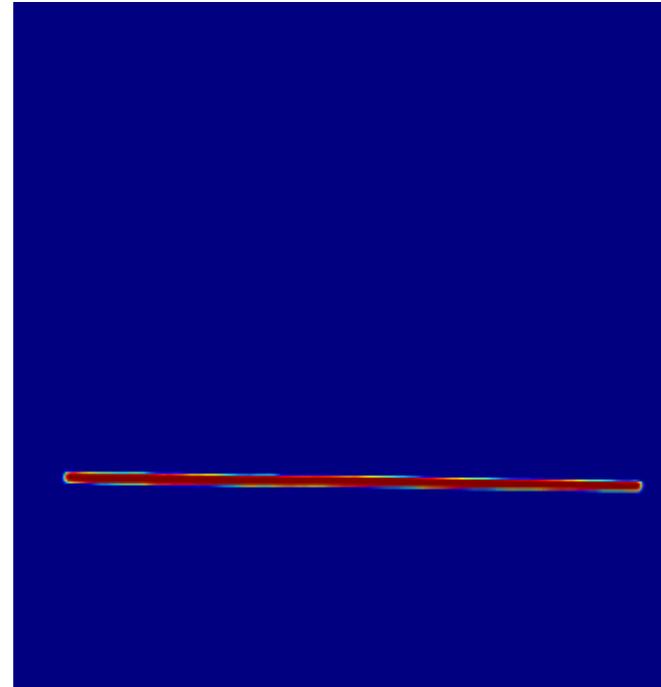
OBB Detection  
IoU: 0.934



Original  
41\_srb\_passport (unknown)



Probability Heatmap



Mask Overlay



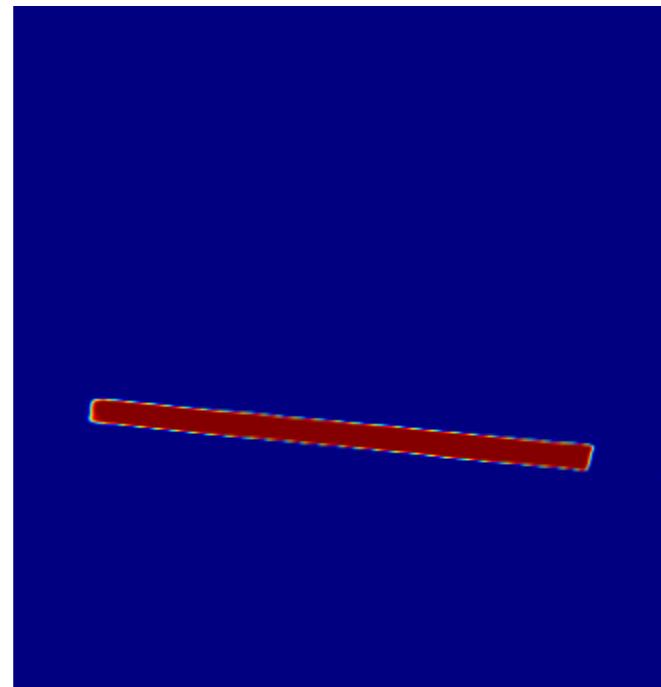
OBB Detection  
IoU: 0.892



Original  
32\_lva\_passport (unknown)



Probability Heatmap



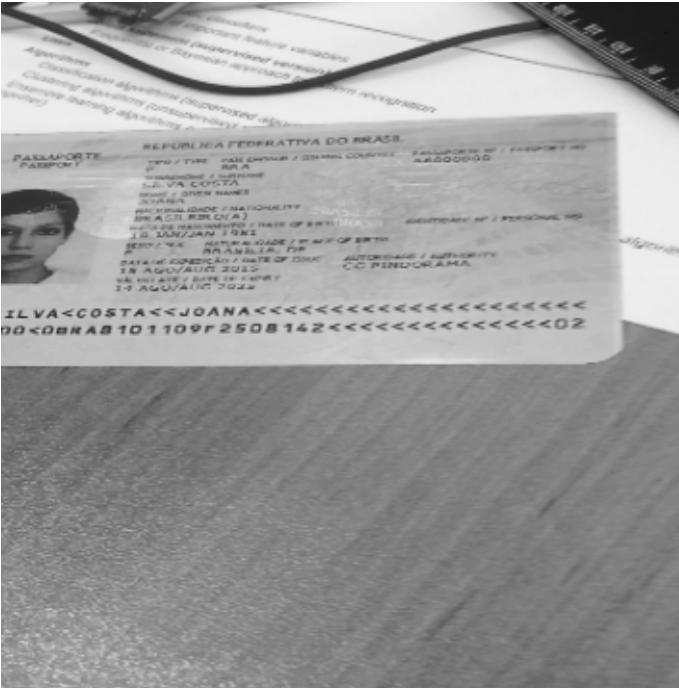
Mask Overlay



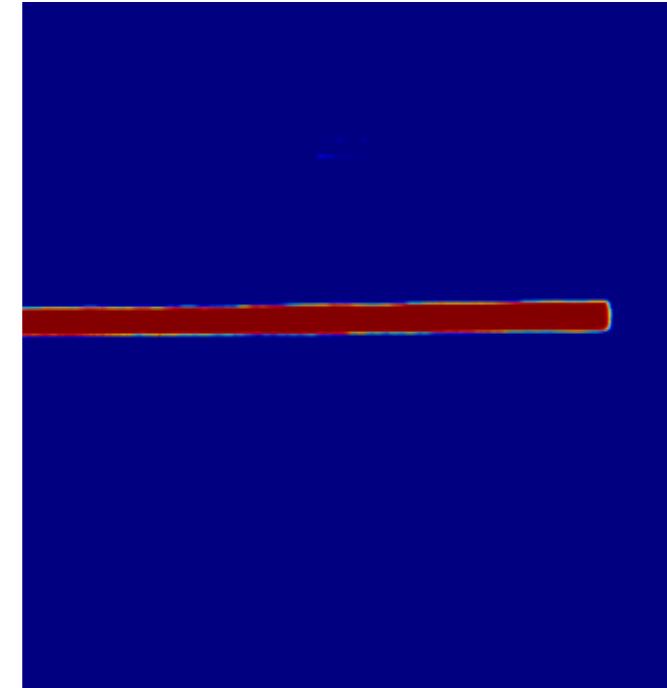
OBB Detection  
IoU: 0.935



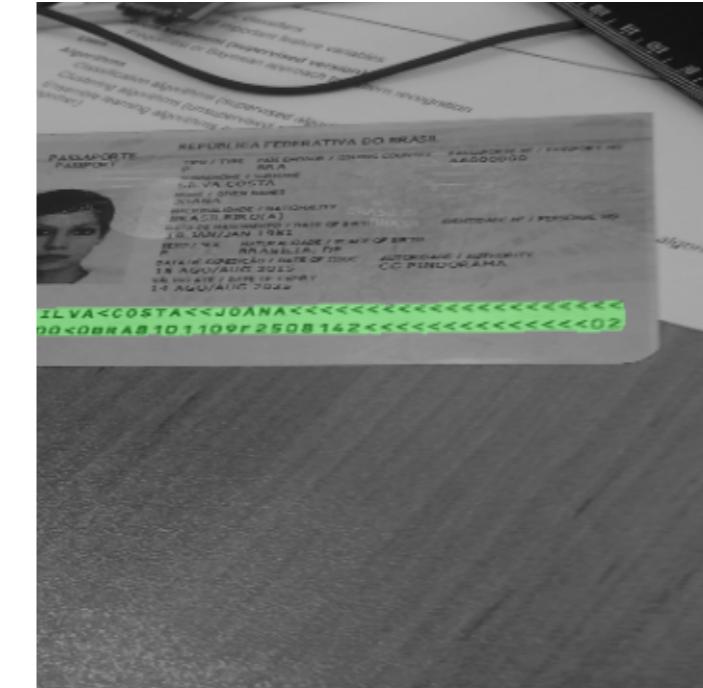
Original  
06\_bra\_passport (unknown)



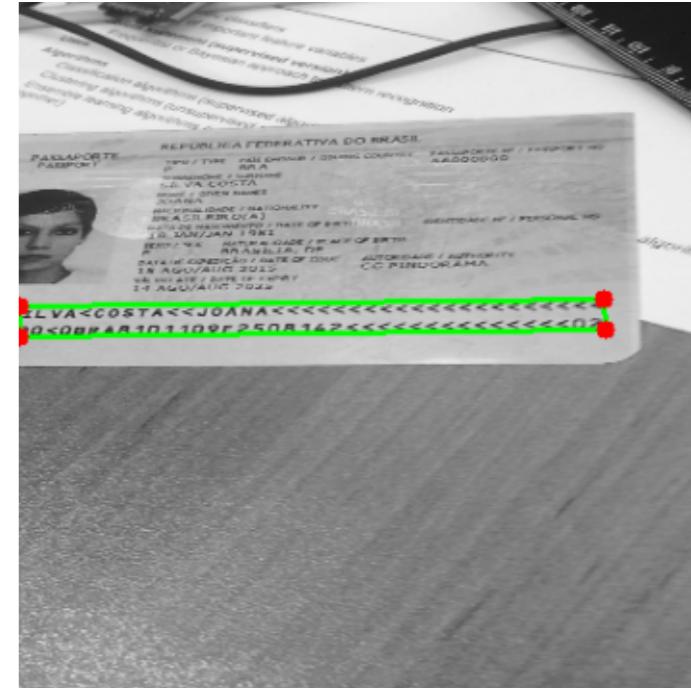
Probability Heatmap



Mask Overlay



OBB Detection  
IoU: 0.828

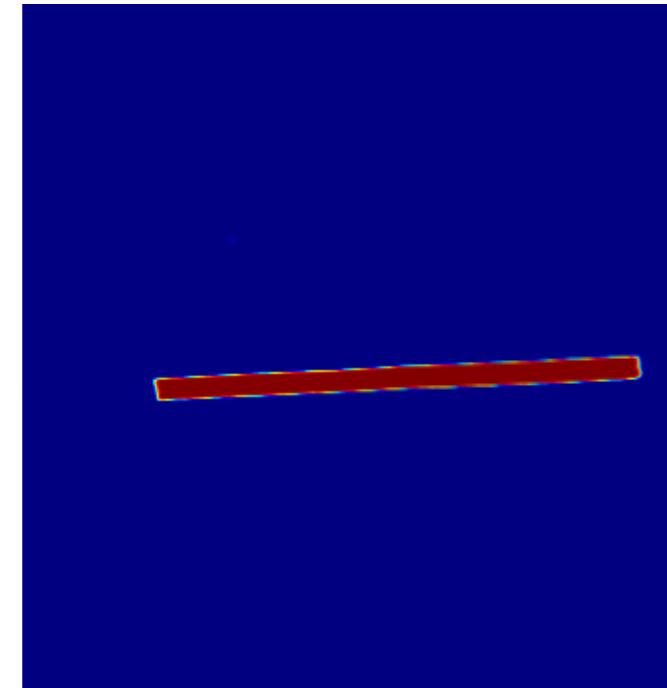


OBB Detection  
IoU: 0.910

Original  
lva\_passport (clips)



Probability Heatmap



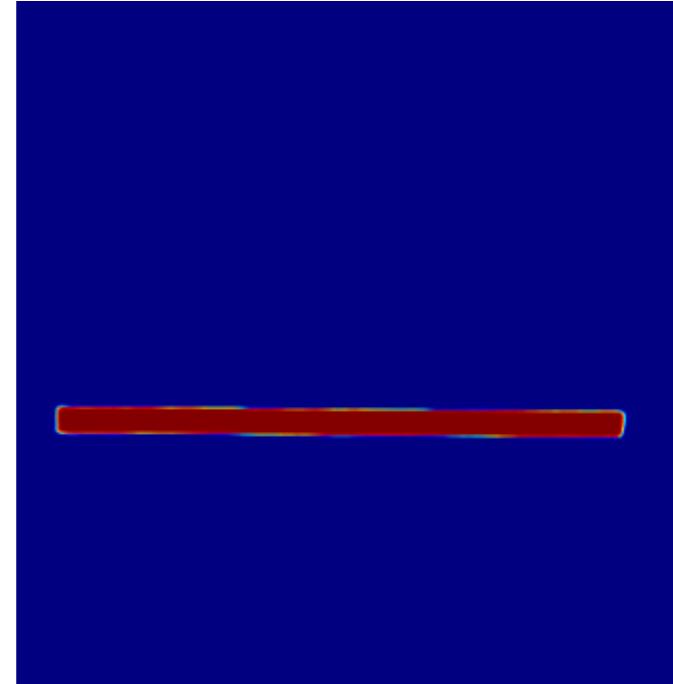
Mask Overlay



Original  
46\_ury\_passport (unknown)



Probability Heatmap



Mask Overlay



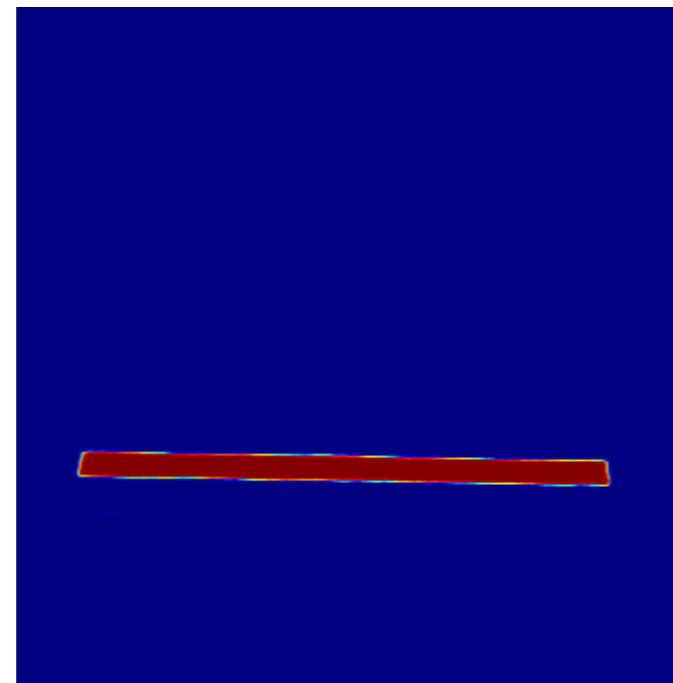
OBB Detection  
IoU: 0.970



Original  
srb\_passport (clips)



Probability Heatmap



Mask Overlay



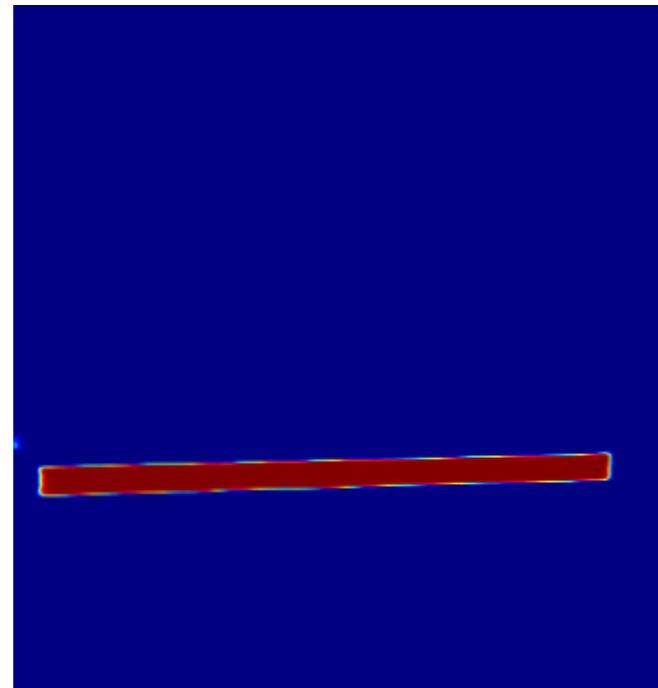
OBB Detection  
IoU: 0.934



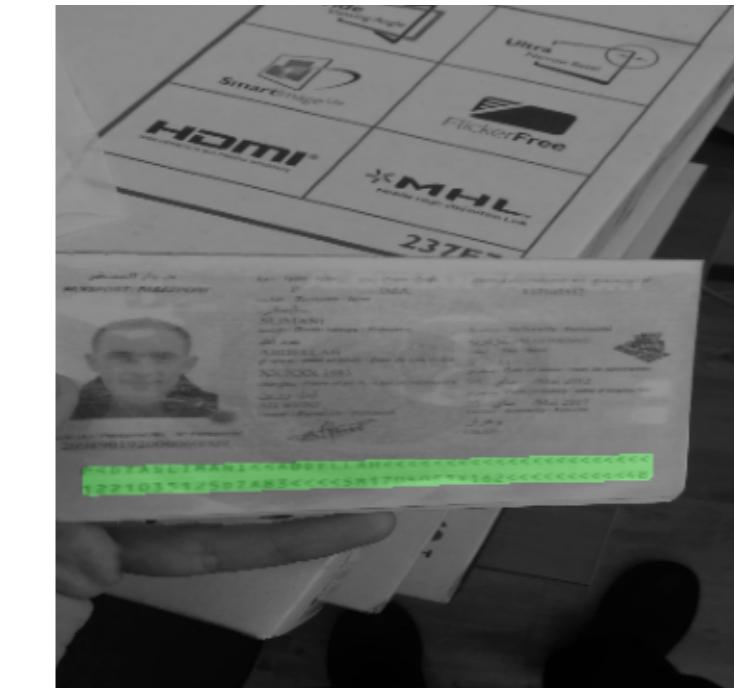
Original  
18\_dza\_passport (unknown)



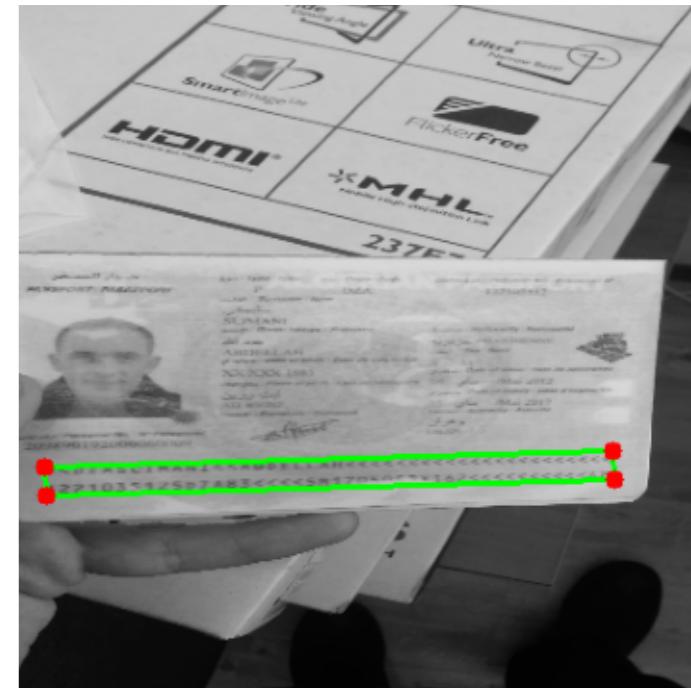
Probability Heatmap



Mask Overlay



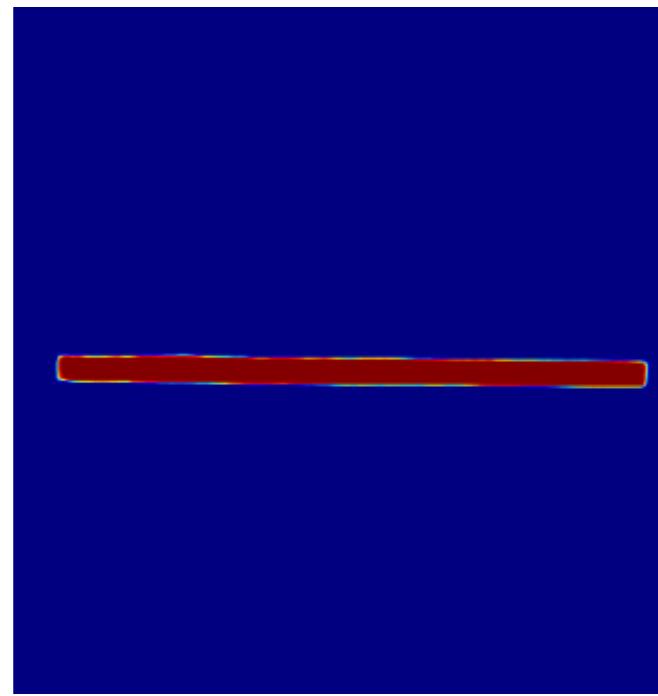
OBB Detection  
IoU: 0.946



Original  
46\_ury\_passport (unknown)



Probability Heatmap



Mask Overlay



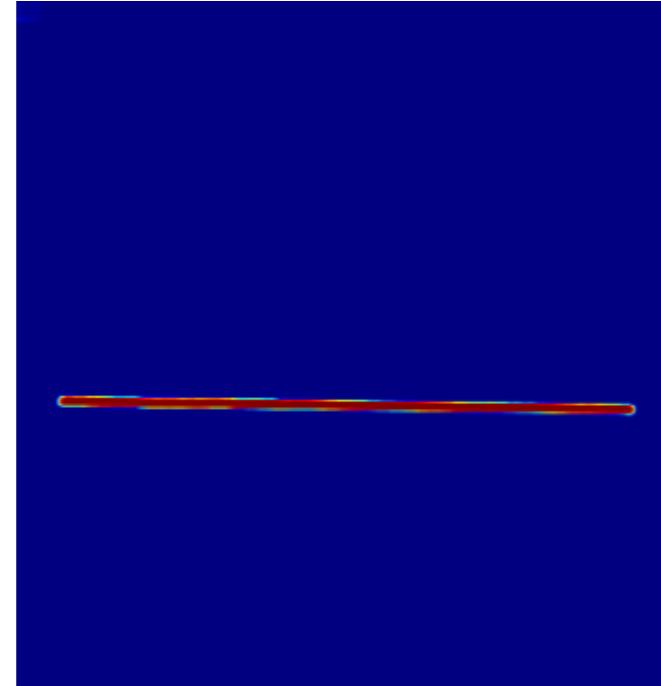
OBB Detection  
IoU: 0.939



Original  
41\_srb\_passport (unknown)



Probability Heatmap



Mask Overlay



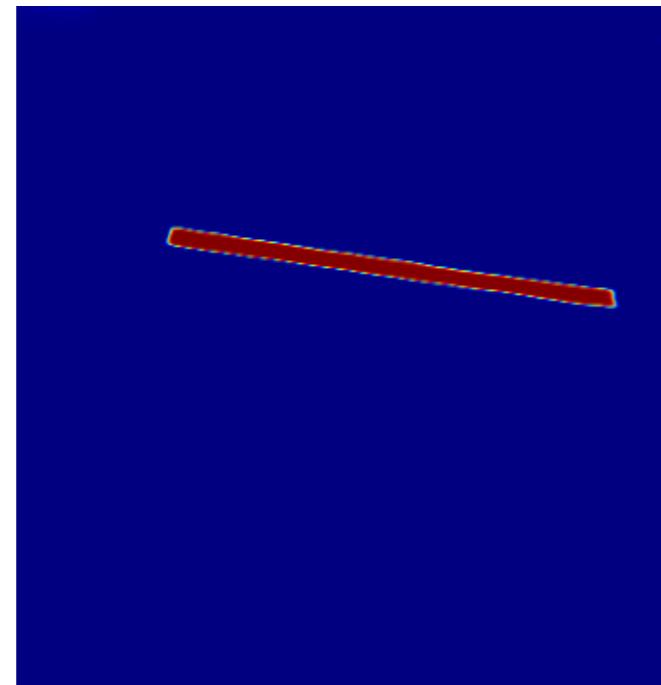
OBB Detection  
IoU: 0.888



Original  
aze\_passport (clips)



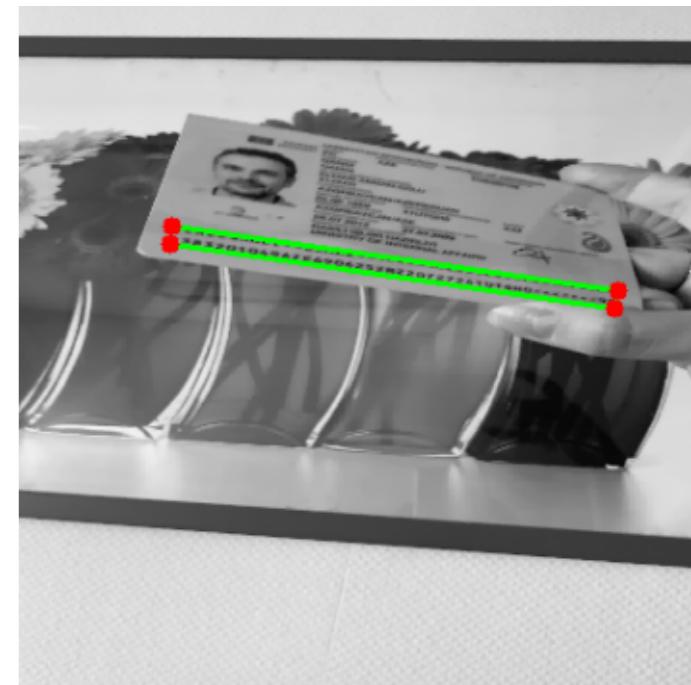
Probability Heatmap



Mask Overlay



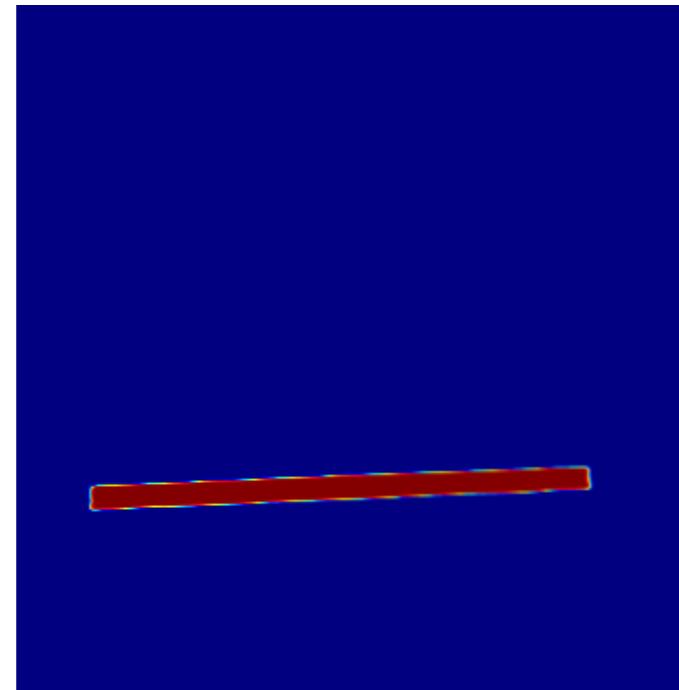
OBB Detection  
IoU: 0.859



Original  
grc\_passport (clips)



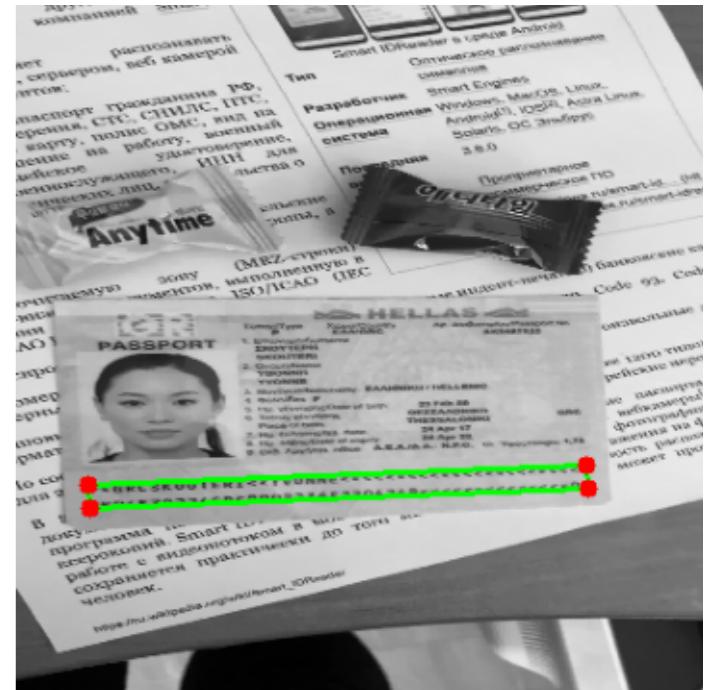
Probability Heatmap



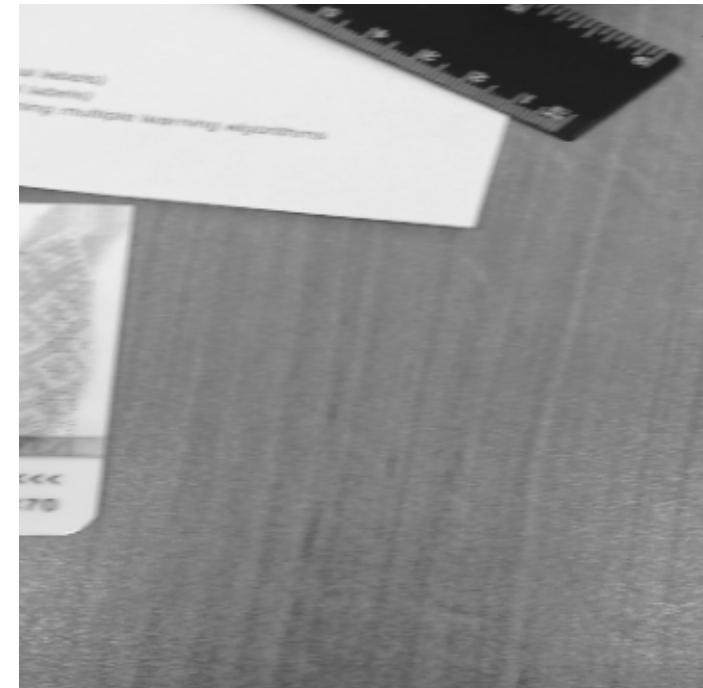
Mask Overlay



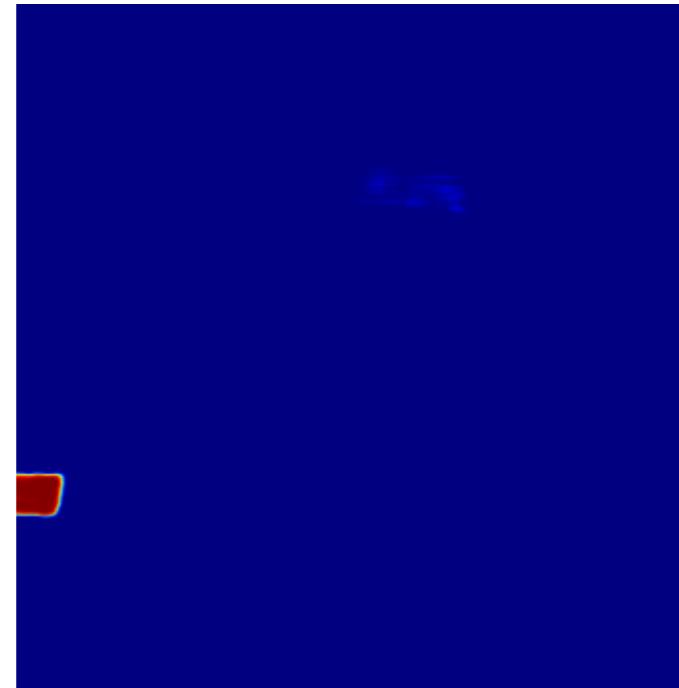
OBB Detection  
IoU: 0.960



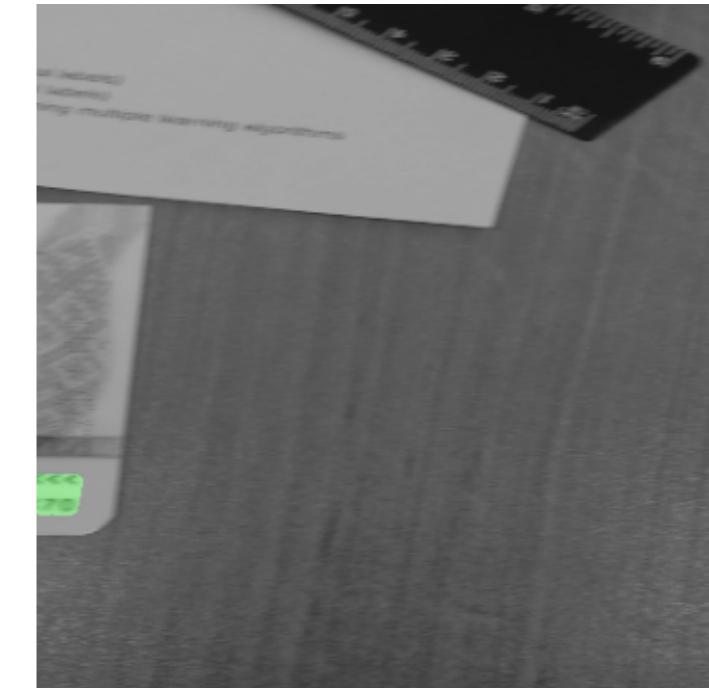
Original  
32\_lva\_passport (unknown)



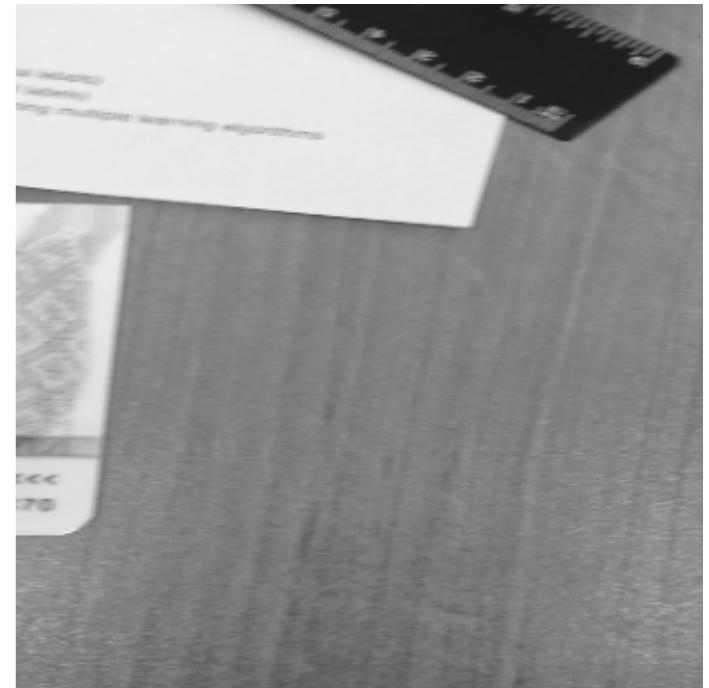
Probability Heatmap



Mask Overlay



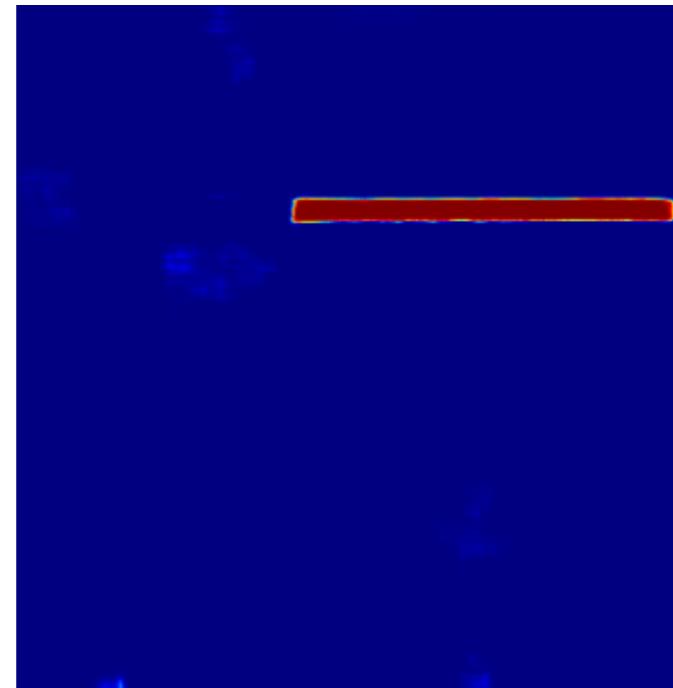
OBB Detection  
IoU: 0.911



Original  
srb\_passport (scan\_upright)



Probability Heatmap



Mask Overlay



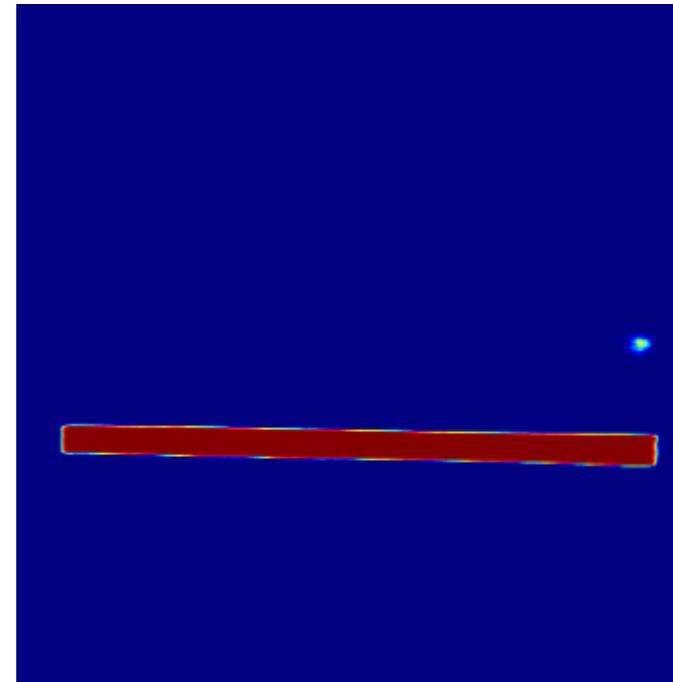
OBB Detection  
IoU: 0.958



Original  
32\_lva\_passport (unknown)



Probability Heatmap



Mask Overlay



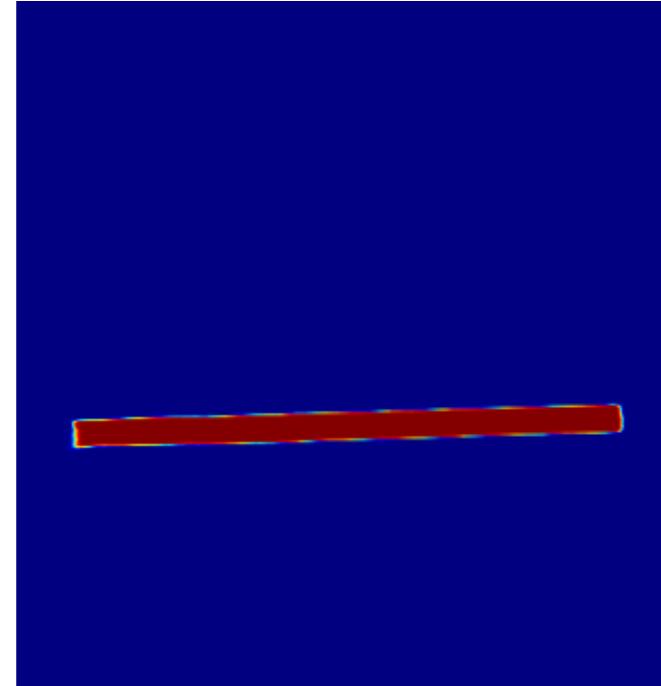
OBB Detection  
IoU: 0.941



Original  
11\_cze\_passport (unknown)



Probability Heatmap



Mask Overlay



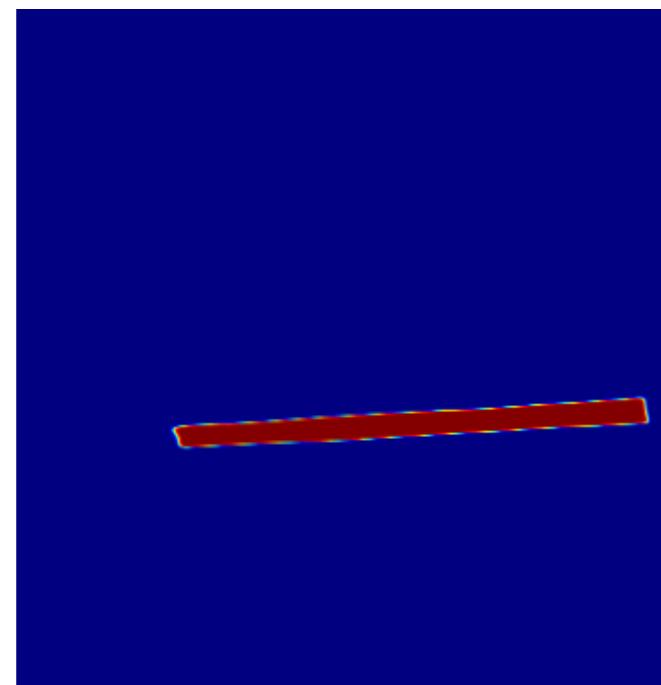
OBB Detection  
IoU: 0.968



Original  
28\_hun\_passport (unknown)



Probability Heatmap



Mask Overlay



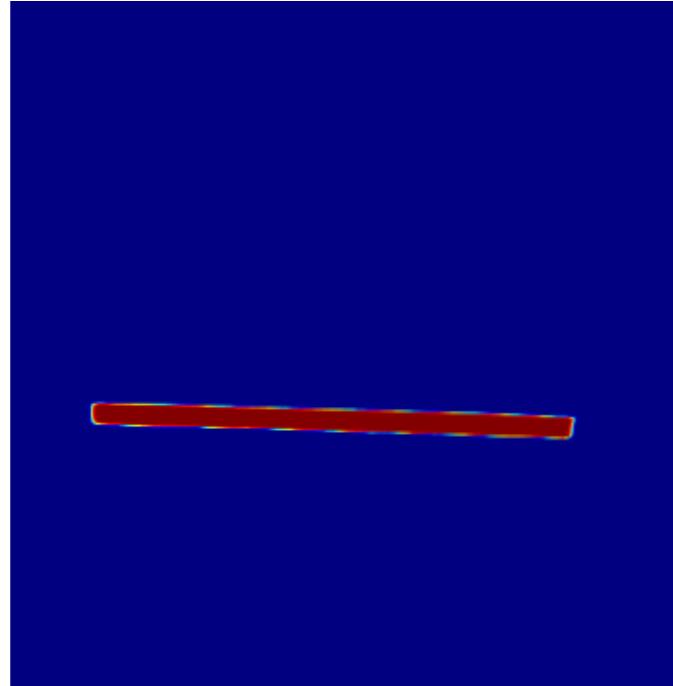
OBB Detection  
IoU: 0.955



Original  
Iva\_passport (photo)



Probability Heatmap



Mask Overlay



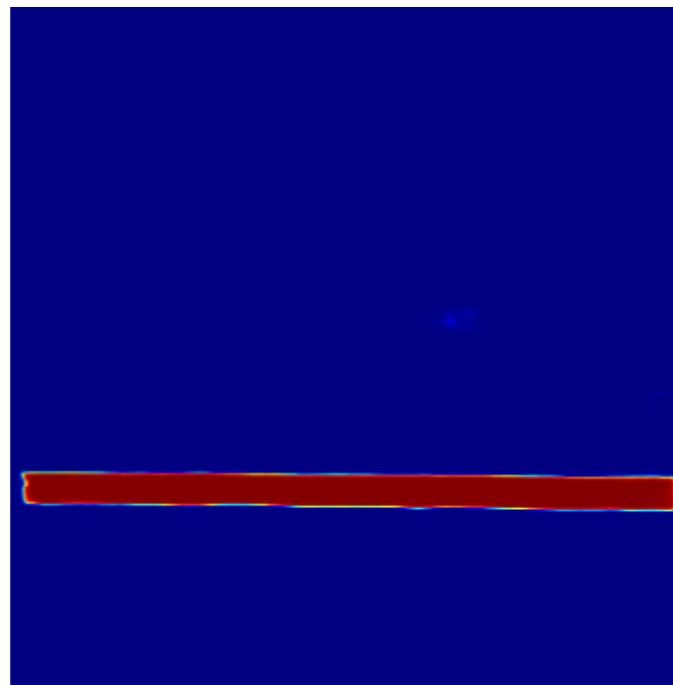
OBB Detection  
IoU: 0.922



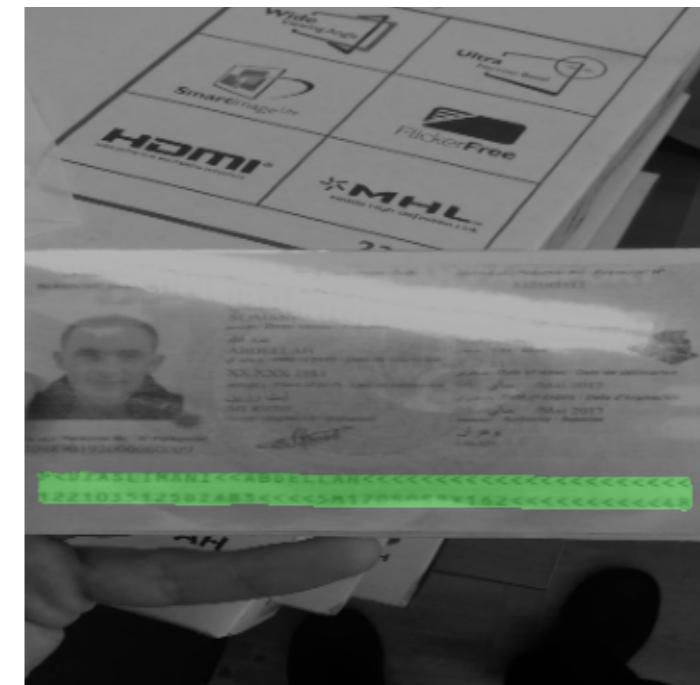
Original  
18\_dza\_passport (unknown)



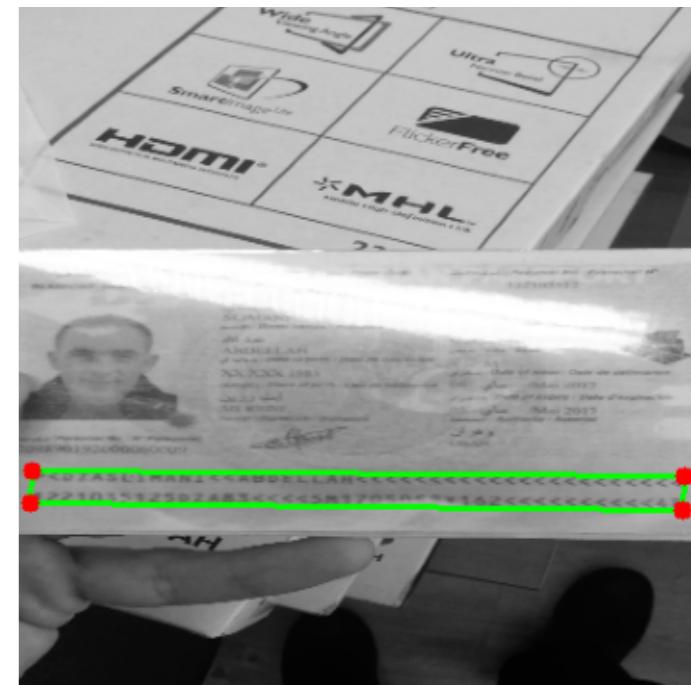
Probability Heatmap



Mask Overlay



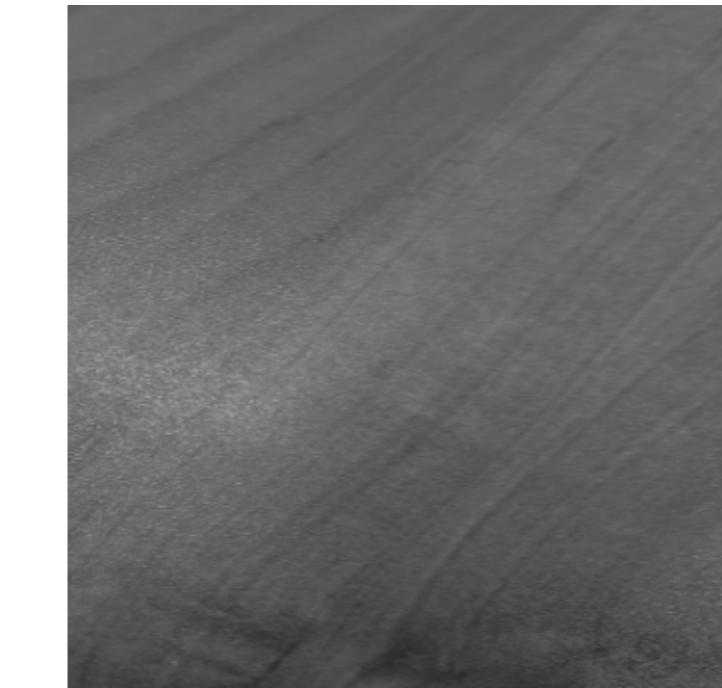
OBB Detection  
IoU: 0.820



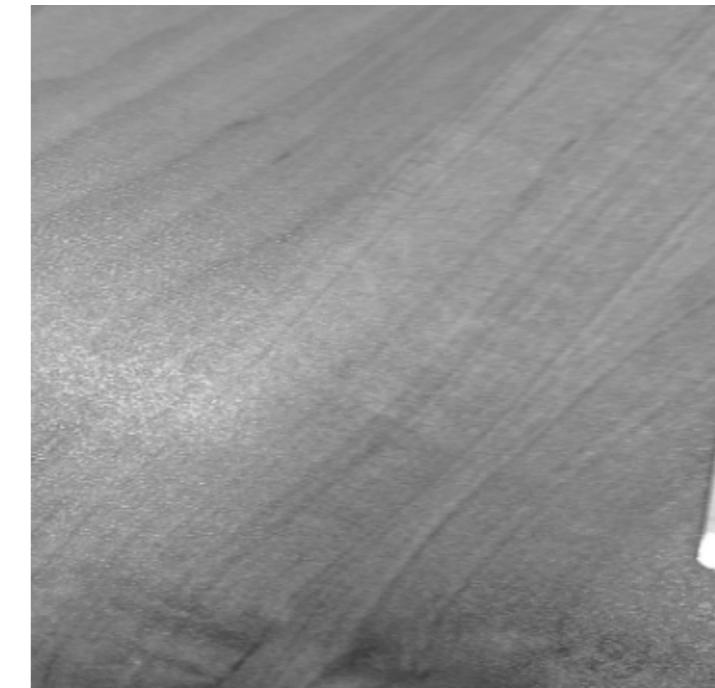
Original  
17\_deu\_passport\_old (unknown)



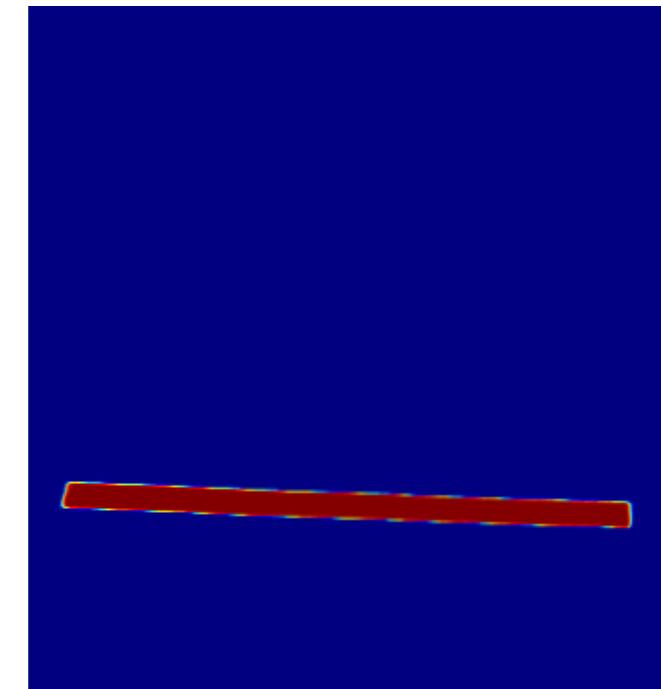
Mask Overlay



OBB Detection  
IoU: 0.000



Original  
lva\_passport (clips)



Mask Overlay



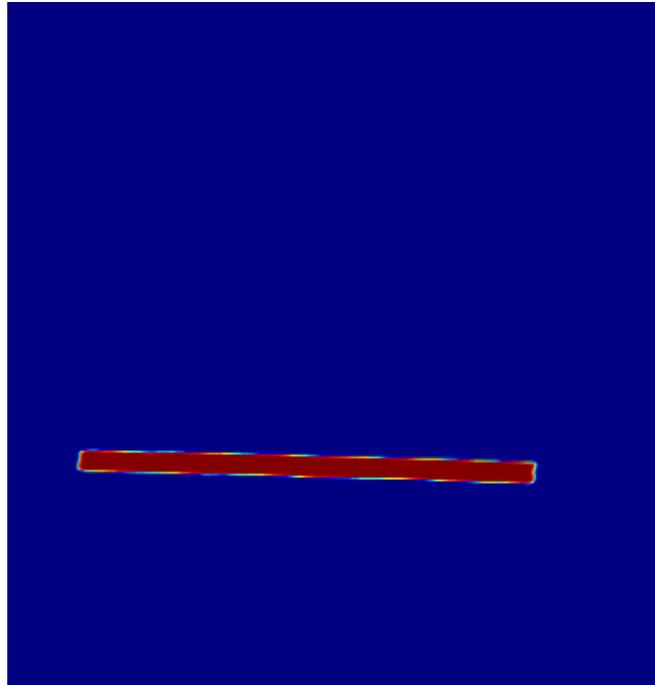
OBB Detection  
IoU: 0.948



Original  
srb\_passport (clips)



Probability Heatmap



Mask Overlay



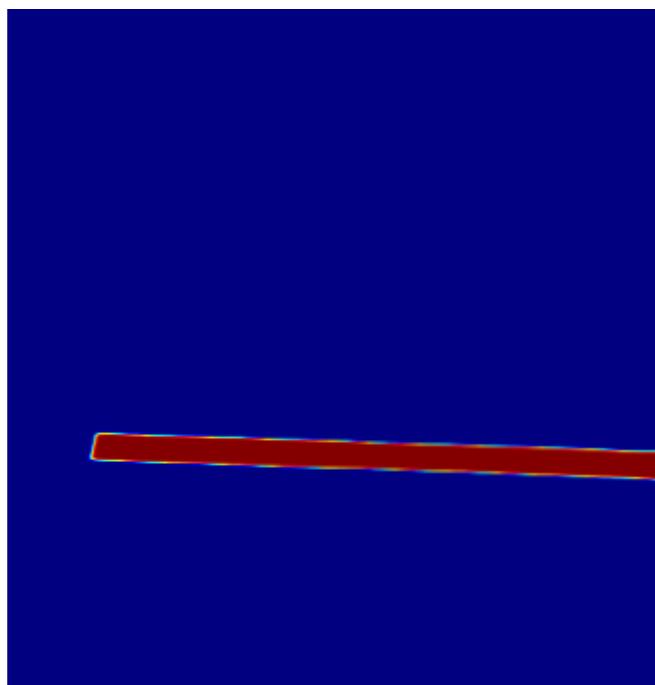
OBB Detection  
IoU: 0.932



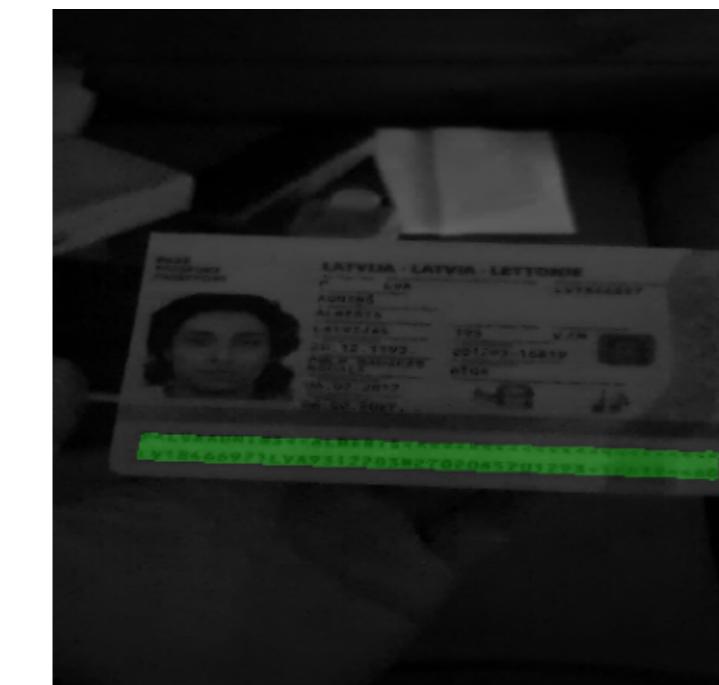
Original  
lva\_passport (clips)



Probability Heatmap



Mask Overlay



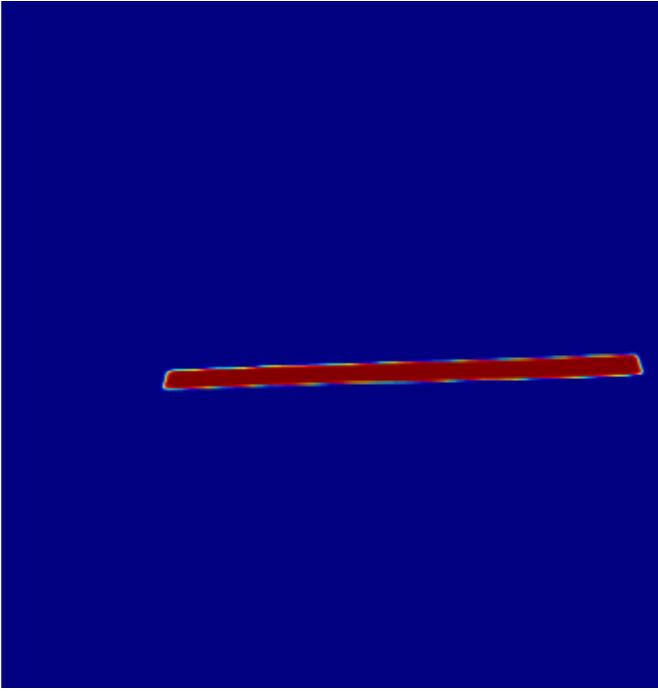
OBB Detection  
IoU: 0.895



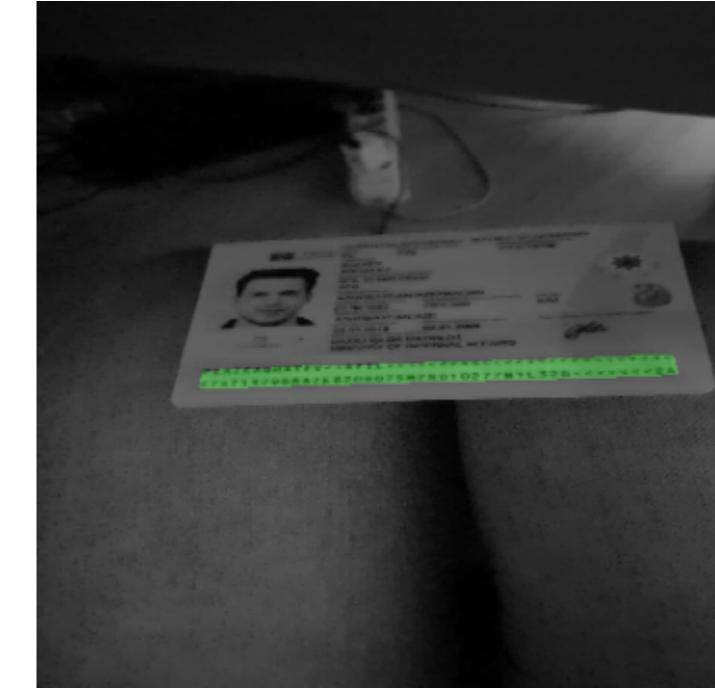
Original  
aze\_passport (clips)



Probability Heatmap



Mask Overlay



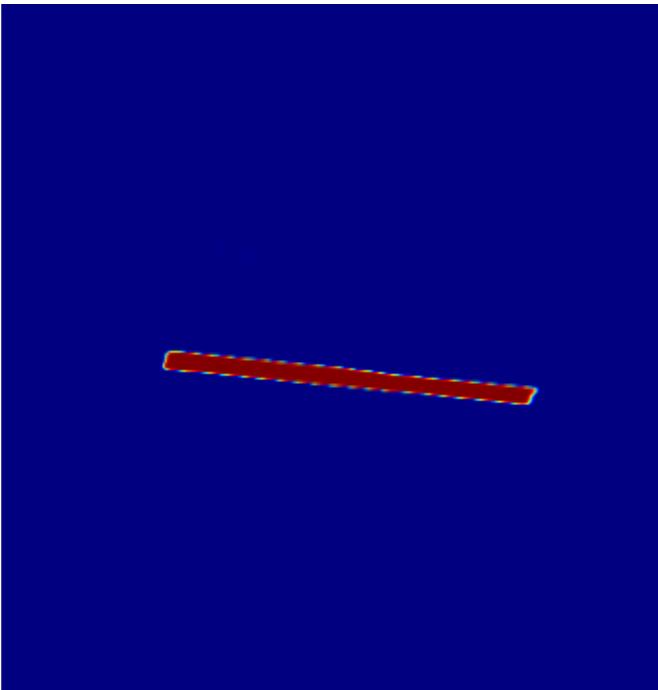
OBB Detection  
IoU: 0.866



Original  
grc\_passport (clips)



Probability Heatmap



Mask Overlay



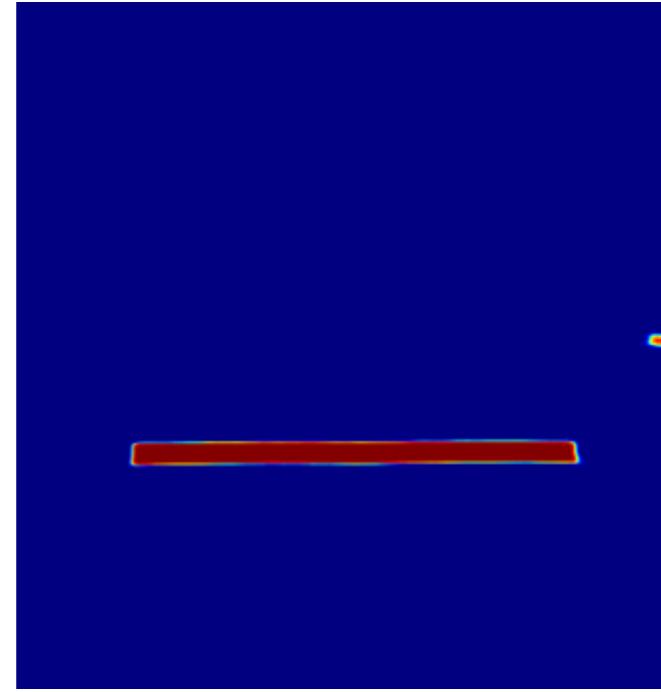
OBB Detection  
IoU: 0.953



Original  
srb\_passport (clips)



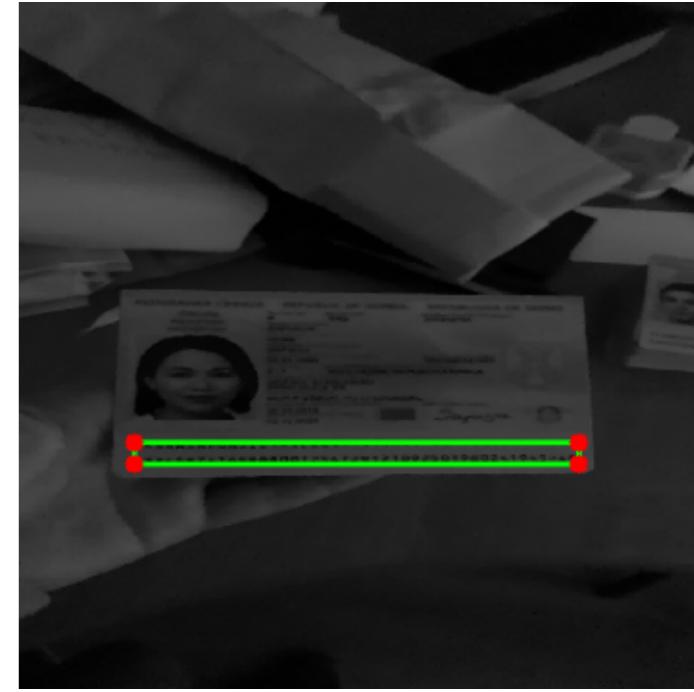
Probability Heatmap



Mask Overlay



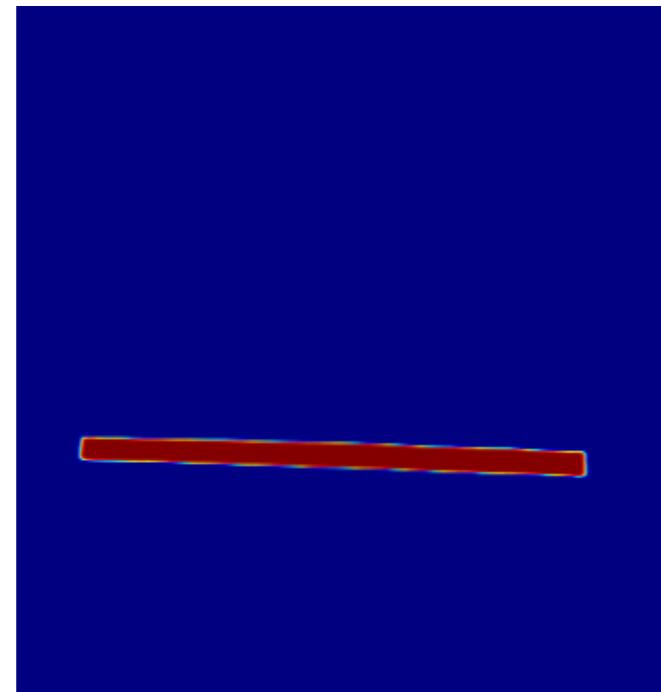
OBB Detection  
IoU: 0.879



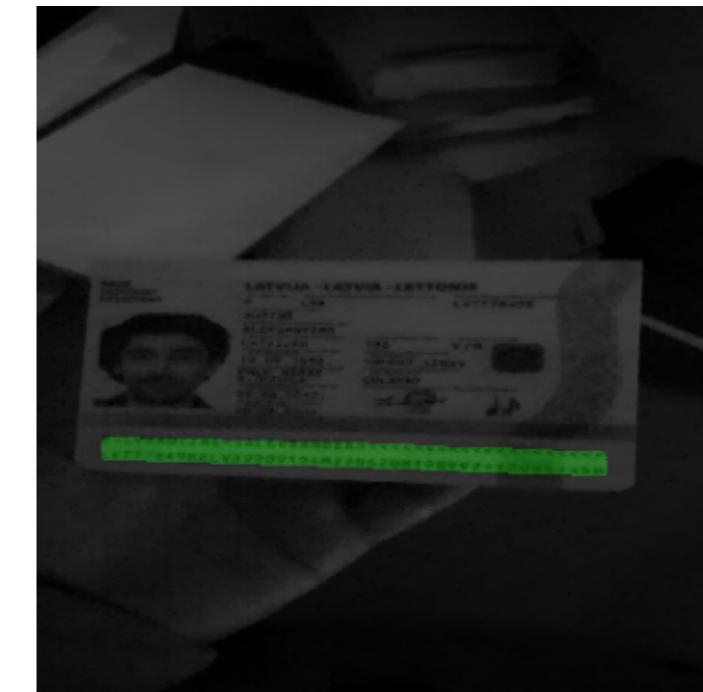
Original  
lva\_passport (clips)



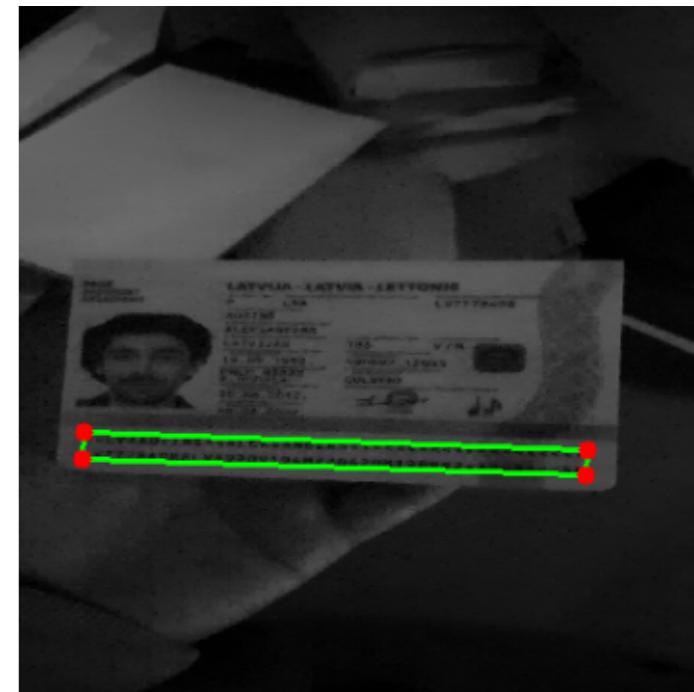
Probability Heatmap



Mask Overlay



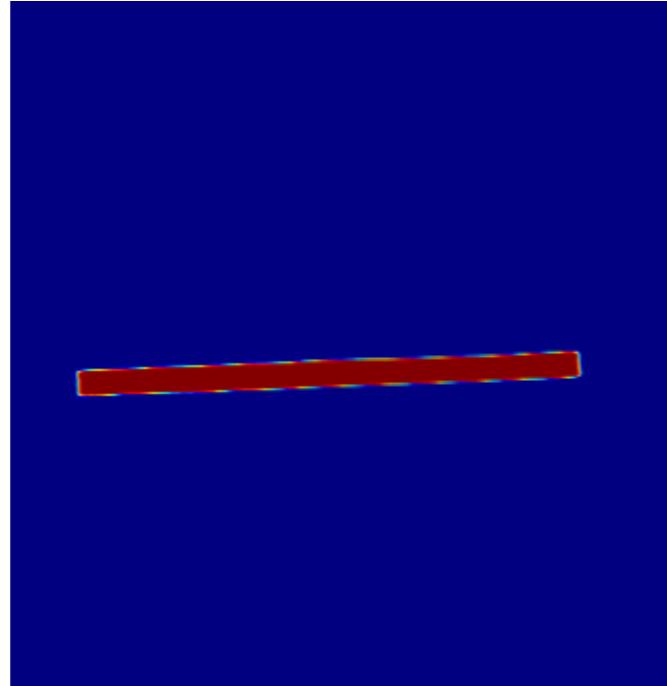
OBB Detection  
IoU: 0.936



Original  
11\_cze\_passport (unknown)



Probability Heatmap



Mask Overlay



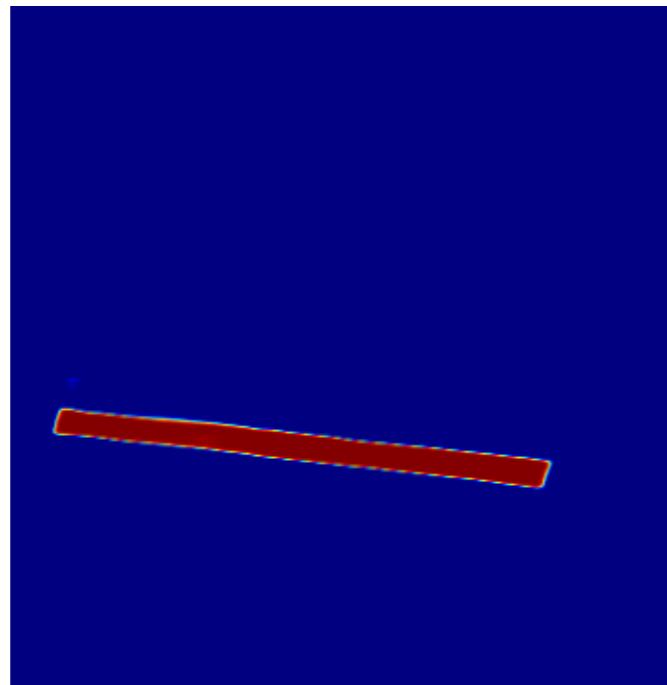
OBB Detection  
IoU: 0.973



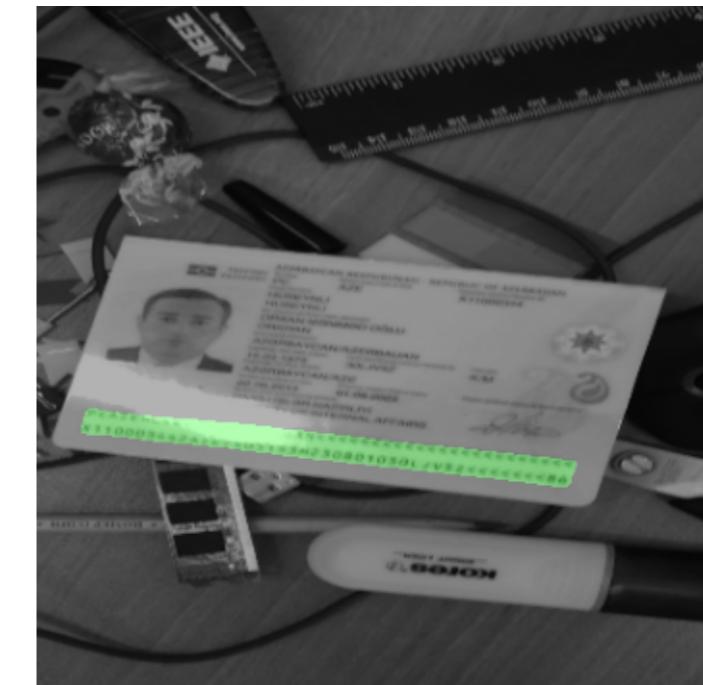
Original  
05\_aze\_passport (unknown)



Probability Heatmap



Mask Overlay



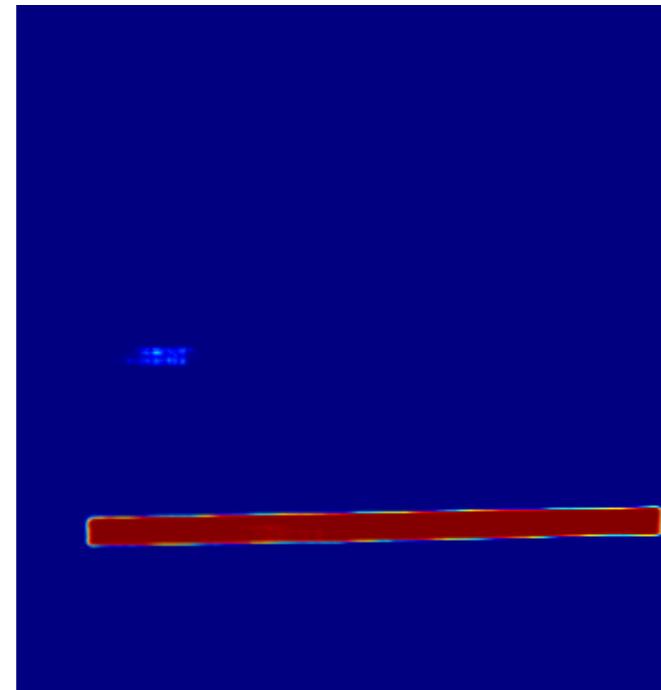
OBB Detection  
IoU: 0.965



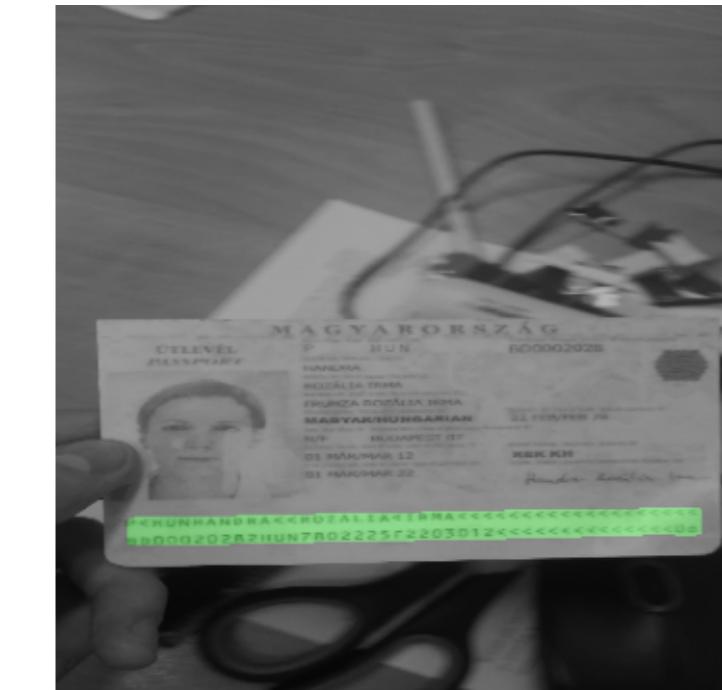
Original  
28\_hun\_passport (unknown)



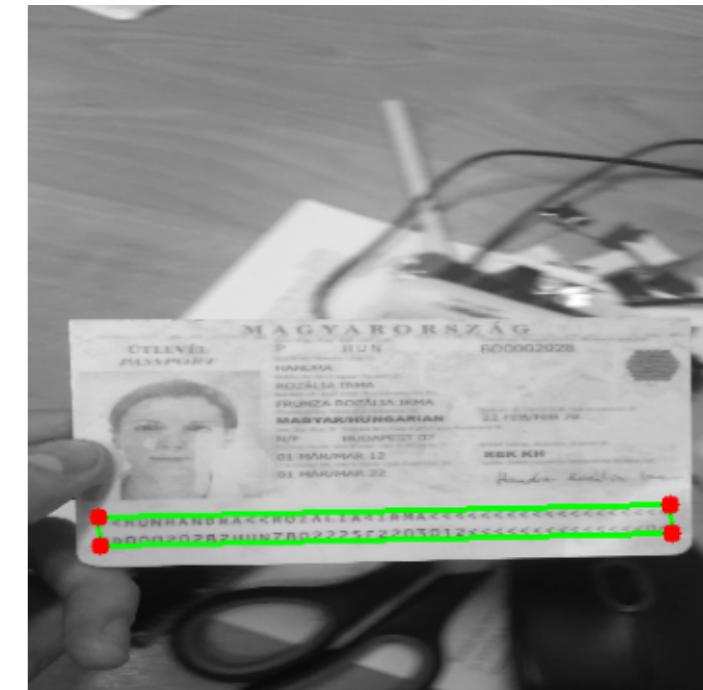
Probability Heatmap



Mask Overlay



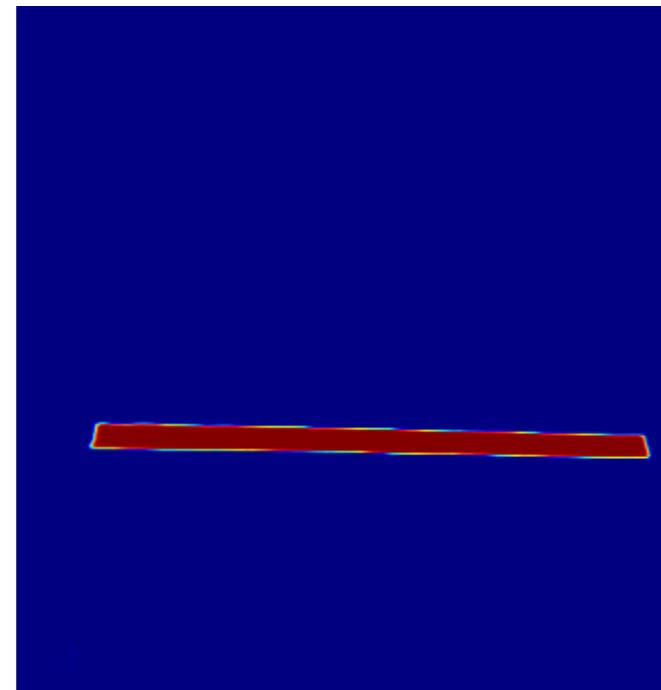
OBB Detection  
IoU: 0.955



Original  
aze\_passport (clips)



Probability Heatmap



Mask Overlay



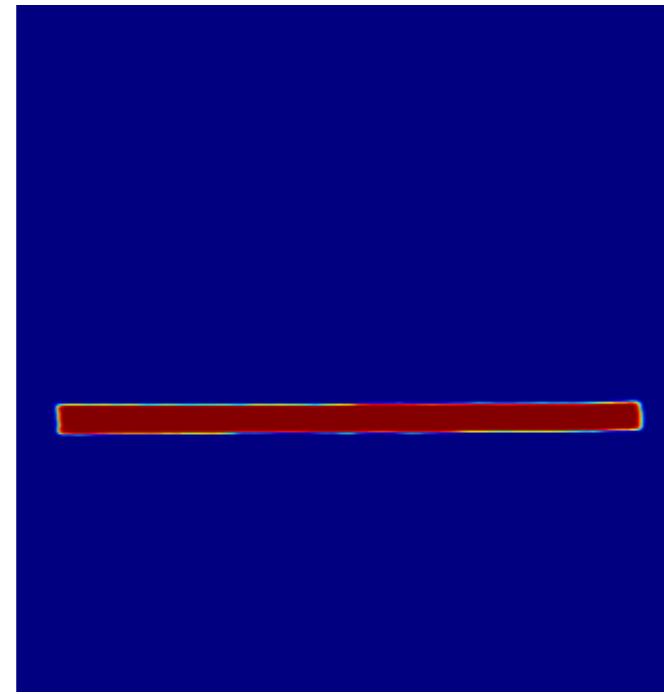
OBB Detection  
IoU: 0.907



Original  
18\_dza\_passport (unknown)



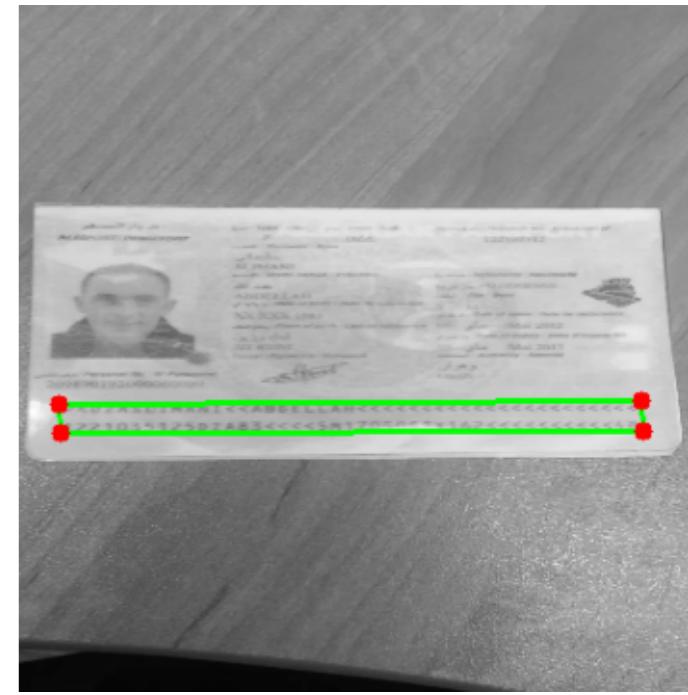
Probability Heatmap



Mask Overlay



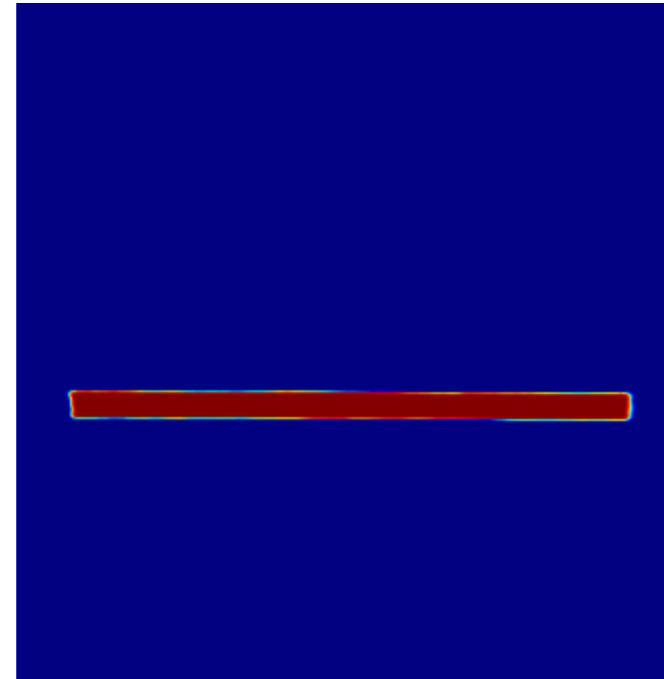
OBB Detection  
IoU: 0.972



Original  
18\_dza\_passport (unknown)



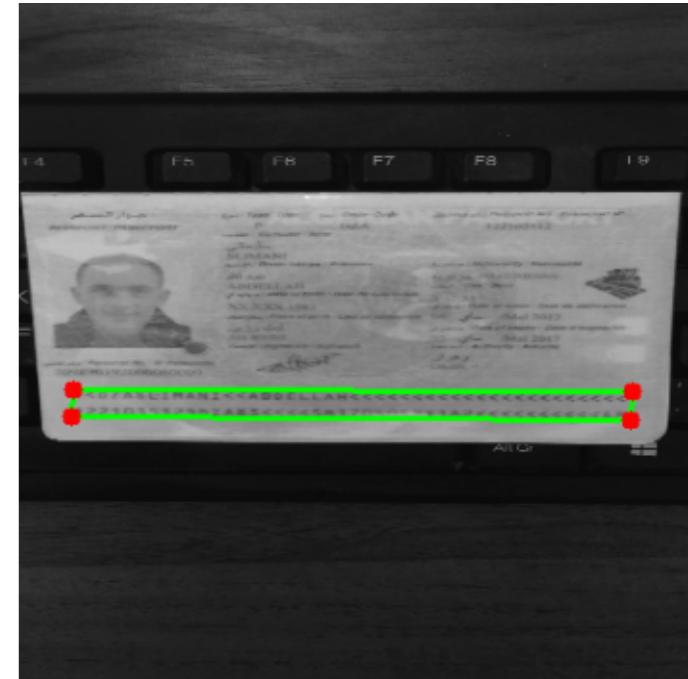
Probability Heatmap



Mask Overlay



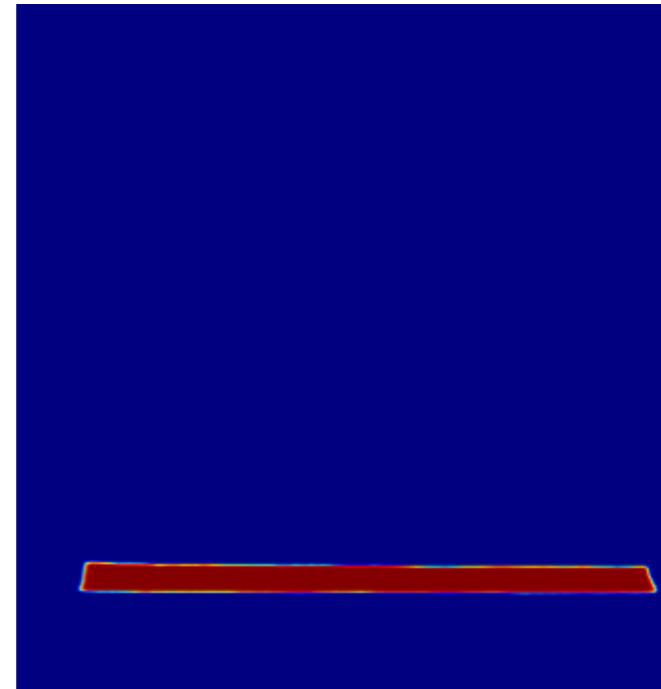
OBB Detection  
IoU: 0.946



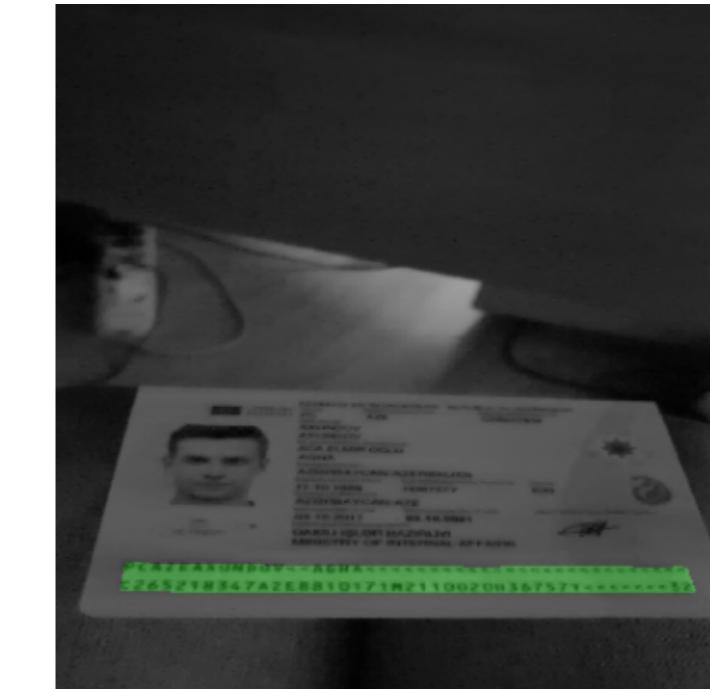
Original  
aze\_passport (clips)



Probability Heatmap



Mask Overlay



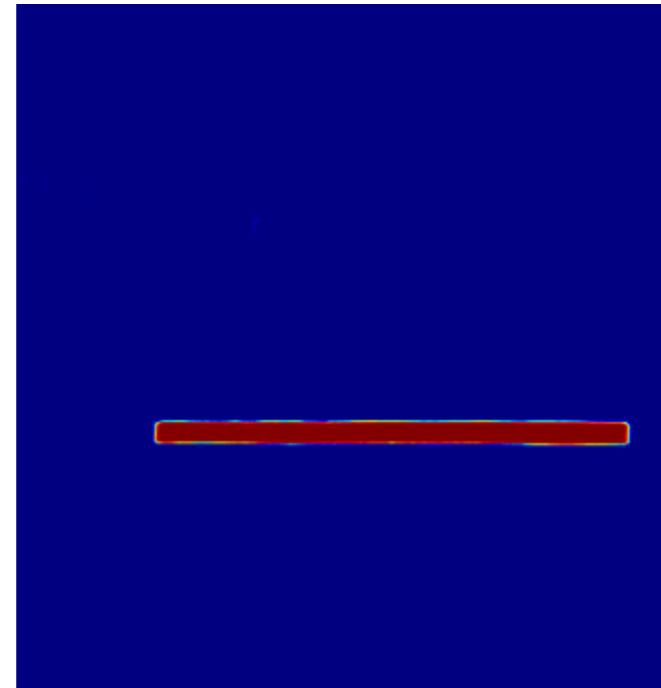
OBB Detection  
IoU: 0.937



Original  
lva\_passport (clips)



Probability Heatmap



Mask Overlay



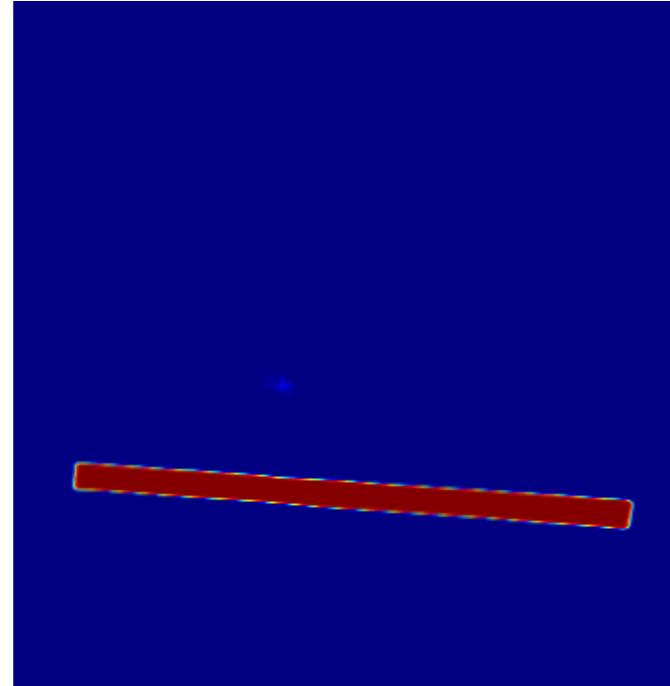
OBB Detection  
IoU: 0.968



Original  
32\_lva\_passport (unknown)



Probability Heatmap



Mask Overlay



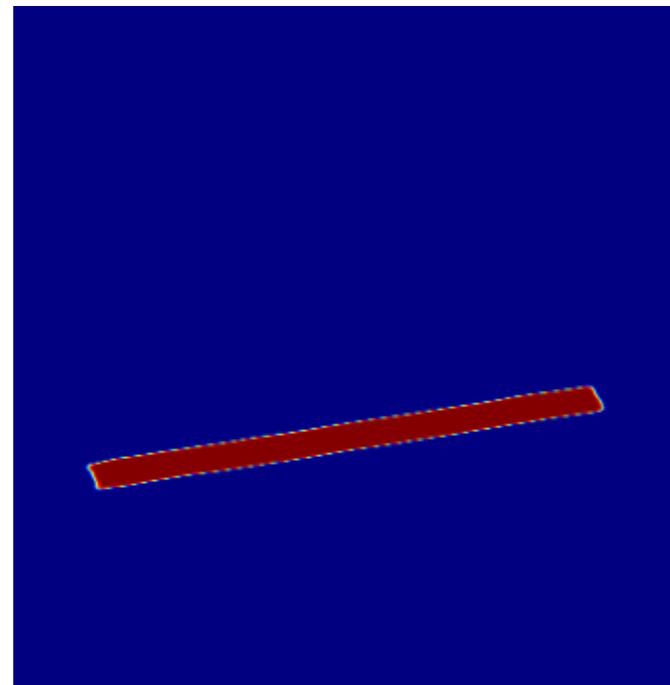
OBB Detection  
IoU: 0.939



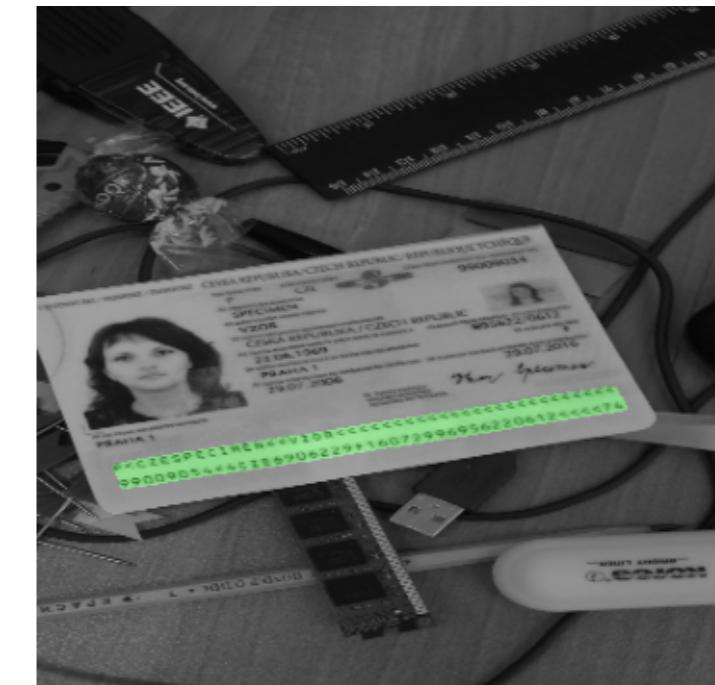
Original  
11\_cze\_passport (unknown)



Probability Heatmap



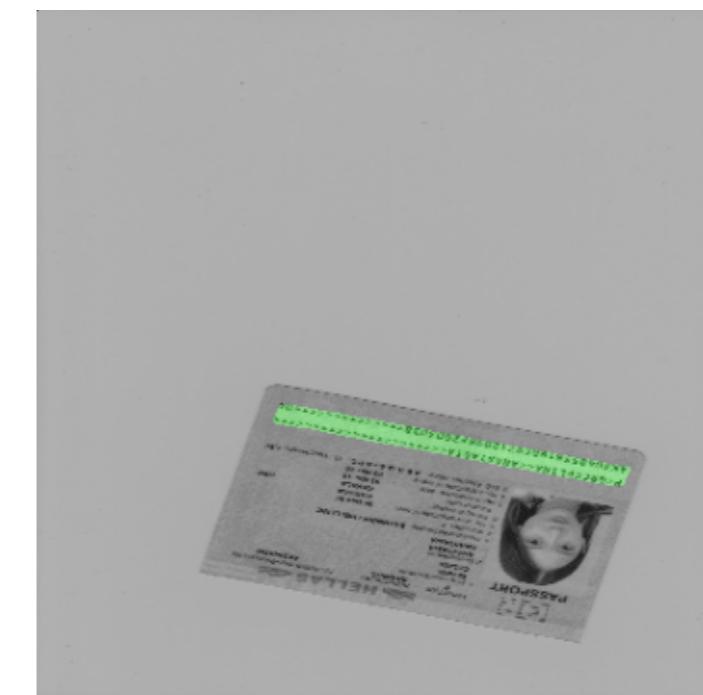
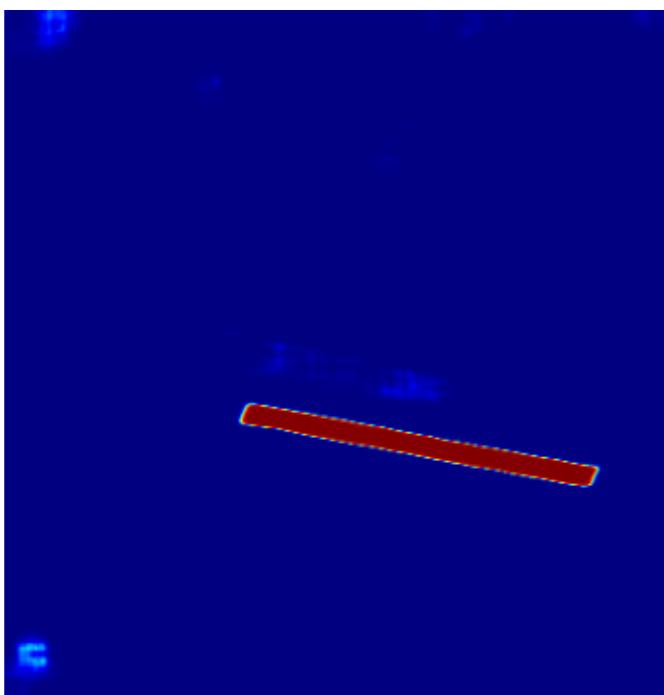
Mask Overlay



OBB Detection  
IoU: 0.966



Original  
grc\_passport (scan\_rotated)



Original  
17\_deu\_passport\_old (unknown)

