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CORRECTION

# Correction to: On the Arbitrary-Oriented Object Detection: Classification Based Approaches Revisited

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**Correction to: International Journal of Computer Vision**
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In the PDF of this article, the reference to the Fig. 4 throughout the article is incorrect and should have been the following information. The original article PDF has now been corrected.

### In Fig. 4 Caption

### Before Correction

Comparison of four regression-based rotation detection methods and angle classification-based protocols in the boundary case. 'H' and 'R' represent the horizontal and rotating anchors. Red dotted circles indicate some bad cases. i–f shows that the Gaussian window function performs best, while the pulse function performs worst because it has not learned any orientation and scale information. According to f and i, the 180°-CSL-based protocol obviously has better boundary prediction due to the EoE problem still exists in the 90°-CSL-based protocol. In general, CSL-based and DCL-based protocols have no boundary problem, as shown in f and d (Color figure online).

### After Correction

Comparison of four regression-based rotation detection methods and angle classification-based protocols in the boundary case. 'H' and 'R' represent the horizontal and rotating anchors. Red dotted circles indicate some bad cases. f–i shows that the Gaussian window function performs best, while the pulse function performs worst because it has not learned any orientation and scale information. According to i and j, the 180°-CSL-based protocol obviously has better boundary prediction due to the EoE problem still exists in the 90°-CSL-based protocol. In general, CSL-based and DCL-based protocols have no boundary problem, as shown in i and e (Color figure online).

### 3.2 Boundary Problem of Regression Method, fourth paragraph

### Before Correction

In this paper, we will start from a new perspective and replace regression with classification to achieve better and more robust rotation detectors. We reproduce some classic rotation detectors based on regression and compare them visually under boundary conditions, as shown in Fig. 4a–c. In contrast, CSL-based and DCL-based protocols have no boundary problem, as shown in Fig. 4f and d.

### After Correction

In this paper, we will start from a new perspective and replace regression with classification to achieve better and more robust rotation detectors. We reproduce some classic rotation detectors based on regression and compare them visually under boundary conditions, as shown in Fig. 4a–d. In contrast, CSL-based and DCL-based protocols have no boundary problem, as shown in Fig. 4i and e.

### 3.4 Circular Smooth Label for Angular Classification

### Before Correction

**Reason (i)** The EoE problem still exists when the bounding box uses the 90°-based protocol, as shown in Fig. 4g. Moreover, 90°-based protocol has two different border cases (vertical and horizontal), while 180°-based protocol has only vertical border cases.

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**After Correction**

**Reason (i)** The EoE problem still exists when the bounding box uses the 90°-based protocol, as shown in Fig. 4j.

Moreover, 90°-based protocol has two different border cases (vertical and horizontal), while 180∘-based protocol has only vertical border cases.

### 4.2 Ablation Study, second paragraph

**Before Correction**

In general, the Gaussian window function performs best, while the pulse function performs worst because it has not learned any orientation and scale information. Figure 4e and f show the visualization of the four window functions. According to Fig. 4f and g, the 180∘-CSL-based protocol obviously has better boundary prediction due to the EoE problem still exists in the 90∘-CSL-based protocol. Figure 4 shows the consistent results with the those in Table 5.

**After Correction**

In general, the Gaussian window function performs best, while the pulse function performs worst because it has not learned any orientation and scale information. Figure 4f-i show the visualization of the four window functions. According to Fig. 4i and j, the 180∘-CSL-based protocol obviously has better boundary prediction due to the EoE problem still exists in the 90∘-CSL-based protocol. Figure 4 shows the consistent results with the those in Table 5.

**Visual analysis of angular features**

**Before Correction**

By zooming in on part of Fig. 4f, we show that the prediction of the boundary conditions become continuous (for example, two large vehicle in the same direction predicted 90° and − 88°, respectively).

**After Correction**

By zooming in on part of Fig. 4i, we show that the prediction of the boundary conditions become continuous (for example, two large vehicle in the same direction predicted 90° and − 88°, respectively).