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International Conference on Data Analytics & Management (ICDAM-2025) : Submission (1393) has been edited.

2 messages

Microsoft CMT <noreply@msr-cmt.org> Tue, Jun 10, 2025 at 12:23 PM
To: Mohit1Upadhyay@gmail.com

Hello,

The following submission has been edited.

Track Name: SS-7 : Recent Advancements in Artificial Intelligence

Paper ID: 1393

Paper Title: Enhancing YOLO with Rotated Bounding Boxes and ResNet50 Backbone for Accurate Orientation-Aware Object Detection

Abstract:
Object detection frameworks utilizing You Only Look Once (YOLO) designs have demonstrated exceptional results in terms of both speed and accuracy for detecting axis-aligned bounding boxes. Nevertheless, practical applications in areas such as aerial imaging, robotics, and medical imaging often involve objects that can be oriented in any direction, highlighting significant limitations in standard YOLO versions. This study addresses these challenges by presenting an enhanced YOLO framework that incorporates a rotated bounding box format $[x, y, w, h, \theta]$ alongside a ResNet50 backbone to improve feature extraction. We introduce a combined loss function that features a tailored circular IoU-based angle regression component, which enables more accurate estimation of orientation. Comprehensive experiments on the DOTA dataset reveal that our approach achieves substantial improvements, with a 13.5\% increase in mean average precision (mAP) and an 18\% improvement in rotated IoU compared to baseline models, while maintaining near real-time inference at approximately 45 fps on NVIDIA RTX 3060 hardware. These findings demonstrate the effectiveness of our proposed modifications for orientation-sensitive object detection, establishing a robust foundation for applications that require precise localization of objects with arbitrary orientations without compromising computational performance.

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Last Modified: Tue, 10 Jun 2025 06:52:54 GMT

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Secondary Subject Areas: Not Entered

Submission Files:
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final Paper ID 1393 icdam2025 yolo_compressed.pdf (194 Kb, Tue, 10 Jun 2025 06:52:50 GMT)

Submission Questions Response: Not Entered

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CMT team.

User Profile.

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Redmond, WA 98052

Microsoft CMT <noreply@msr-cmt.org> Tue, Jun 10, 2025 at 12:24 PM
To: Mohit1Upadhyay@gmail.com

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Secondary Subject Areas: Not Entered

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Submission Questions Response: Not Entered

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