Novelty Assessment Report

Paper: Point2RBox-v3: Self-Bootstrapping from Point Annotations via Integrated Pseudo-Label Refinement and Utilization

PDF URL: https://openreview.net/pdf?id=9vlS8PSGG7

Venue: ICLR 2026 Conference Submission

Year: 2026

Report Generated: 2025-12-30

Abstract

Driven by the growing need for Oriented Object Detection (OOD), learning from point annotations under a weakly-supervised framework has emerged as a promising alternative to costly and laborious manual labeling. In this paper, we discuss two deficiencies in existing point-supervised methods: inefficient utilization and poor quality of pseudo labels. Therefore, we present Point2RBox-v3. At the core are two principles: $\textbf{1) Progressive Label Assignment (PLA)}$. It dynamically estimates instance sizes in a coarse yet intelligent manner at different stages of the training process, enabling the use of label assignment methods. $\textbf{2) Prior-Guided Dynamic Mask Loss (PGDM-Loss)}$. It is an enhancement of the Voronoi Watershed Loss from Point2RBox-v2, which overcomes the shortcomings of Watershed in its poor performance in sparse scenes and SAM's poor performance in dense scenes. To our knowledge, Point2RBox-v3 is the first model to employ dynamic pseudo labels for label assignment, and it creatively complements the advantages of SAM model with the watershed algorithm, which achieves excellent performance in both sparse and dense scenes. Our solution gives competitive performance, especially in scenarios with large variations in object size or sparse object occurrences: 66.09\%/56.86\%/41.28\%/46.40\%/19.60\%/45.96\% on DOTA-v1.0/DOTA-v1.5/DOTA-v2.0/DIOR/STAR/RSAR.

Core Task Landscape

This paper addresses: **Oriented Object Detection from Point Annotations**

A total of **40 papers** were analyzed and organized into a taxonomy with **18 categories**.

Taxonomy Overview

The research landscape has been organized into the following main categories:

- **Pseudo-Label Generation Methods**
- **Segmentation-Driven Detection Frameworks**
- **Weakly Semi-Supervised Training Strategies**
- **Point-Based Representation and Localization**
- **Canonical Feature and Loss Design**
- **Domain-Specific Applications and Extensions**

Complete Taxonomy Tree

- Oriented Object Detection from Point Annotations Survey Taxonomy
- Pseudo-Label Generation Methods
  - Multi-View Geometric Approaches (3 papers)
  - [1] Pointobb: Learning oriented object detection via single point supervision (Junwei Luo, 2024) View paper
  - [7] Pointobb-v3: Expanding performance boundaries of single point-supervised oriented object detection (Peiyuan Zhang, 2025) View paper
  - [11] Pointobb-v2: Towards simpler, faster, and stronger single point supervised oriented object detection (Yang Xue, 2024) View paper
  - Spatial Layout and Relational Constraints ★ (4 papers)
  - [0] Point2RBox-v3: Self-Bootstrapping from Point Annotations via Integrated Pseudo-Label Refinement and Utilization (Anon et al., 2026) View paper
  - [9] Point2rbox-v2: Rethinking point-supervised oriented object detection with spatial layout among instances (Yi Yu, 2025) View paper
  - [20] Relational matching for weakly semi-supervised oriented object detection (Wenhao Wu, 2024) View paper
  - [24] Semantic-decoupled Spatial Partition Guided Point-supervised Oriented Object Detection (Liu XinYuan, 2025) View paper
  - Synthetic Pattern Knowledge Integration (1 papers)
  - [5] Point2rbox: Combine knowledge from synthetic visual patterns for end-to-end oriented object detection with single point supervision (Yi Yu, 2024) View paper
- Segmentation-Driven Detection Frameworks
  - SAM-Based Mask Proposal Methods (4 papers)
  - [8] Semantic Segmentation Everything Model for Pointâ□□Prompted Oriented Object Detection (Xuran Lu, 2025) View paper
  - [22] P2rbox: Point prompt oriented object detection with SAM (Cao Guang-ming, 2023) View paper
  - [36] Semantic-spatial Coupled Segmentation Everything Model for Point-prompted Oriented Object Detection (Xuran Lu, 2024) View paper
  - Multi-Stage Segmentation Pipelines (4 papers)
  - [3] Pmho: Point-supervised oriented object detection based on segmentation-driven proposal generation (Shun Zhang, 2024) View paper
  - [4] Point-to-RBox Network for Oriented Object Detection via Single Point Supervision. (Y Wang, 2023) View paper
  - [10] Two-click based Fast Small Object Annotation in Remote Sensing Images (Lu Lei, 2024) View paper

- [13] SPA: Annotating Small Object with a Single Point in Remote Sensing Images (Wenjie Zhao, 2024) View paper
- Weakly Semi-Supervised Training Strategies
  - Teacher-Student Self-Training (4 papers)
  - [6] Point-based Weakly Semi-Supervised Oriented Vehicle Detection in Optical Remote Sensing Images (Ziqian Tan, 2024) View paper
  - [32] S^{2}Teacher: Step-by-step Teacher for Sparsely Annotated Oriented Object Detection (Lin Yu, 2025) View paper
  - [34] Weakly Semi-Supervised Oriented Object Detection with Points (Ziming Zhang, 2023) View paper
  - [35] Weakly Semi-Supervised Oriented with Points for Remote Sensing Vehicle Detection (Ziqian Tan, 2024) View paper
  - Diversified-Quality Label Utilization (2 papers)
  - [16] Wholly-WOOD: Wholly Leveraging Diversified-quality Labels for Weakly-supervised Oriented Object Detection (Yi Yu, 2025) View paper
  - [17] Partial Weakly-Supervised Oriented Object Detection (Liu Ming-xin, 2025) View paper
- Point-Based Representation and Localization
  - Adaptive Point Set Learning (4 papers)
  - [2] Oriented reppoints for aerial object detection (Wentong Li, 2022) View paper
  - [12] Point-based estimator for arbitrary-oriented object detection in aerial images (Kun Fu, 2020) View paper
  - [14] Rotated points for object detection in remote sensing images (Longbao Wang, 2024) View paper
  - [30] Optimized Point Set Representation for Oriented Object Detection in Remote-Sensing Images (Junjie Song, 2023) View paper
  - Keypoint-Based Detection (3 papers)
  - [18] OSKDet: Orientation-sensitive keypoint localization for rotated object detection (Dongchen Lu, 2022) View paper
  - [29] Oriented Object Detection by Searching Corner Points in Remote Sensing Imagery (Xueqing Chen, 2021) View paper
  - [31] RotPointNet: Keypoint based Oriented Object Detection for Aerial Image (Chong-Yu Wang, 2023) View paper
  - Point-Axis Decoupled Representation (1 papers)
  - [21] Projecting Points to Axes: Oriented Object Detection via Point-Axis Representation (Zhao, 2024) View paper
- Canonical Feature and Loss Design
  - Feature Fusion and Sampling Strategies (1 papers)
  - [23] PointOOD: Point-supervised remote sensing oriented object detection via canonical feature fusion and dynamic radius sampling (Hui Chen, 2025) View paper
  - Modulated and Point-Set Distance Losses (1 papers)
  - [40] RSDet++: Point-Based Modulated Loss for More Accurate Rotated Object Detection (Wen Qian, 2022) View paper
  - Attention and Orientation Enhancement (2 papers)
  - [27] Instance-Level Orientation Enhancement for Horizontal Box Supervised Oriented Object Detection in Remote Sensing Images (Yang Xu, 2025) View paper
  - [37] Improving the Detection of Small Oriented Objects in Aerial Images (Chandler Timm C. Doloriel, 2024) View paper
- Domain-Specific Applications and Extensions
  - SAR and Hyperspectral Image Detection (2 papers)
  - [15] Point-Supervised Oriented Ship Detection via Segment Anything Model for SAR Images (Qiwei Lin, 2025) View paper
  - [25] Spectrum-oriented Point-supervised Saliency Detector for Hyperspectral Images (Peifu Liu, 2024) View paper
  - Video and Crowd Detection (2 papers)
  - [28] Pointflow: Point Supervised Video Object Detection (Kuiran Wang, 2025) View paper
  - [38] A Self-Training Approach for Point-Supervised Object Detection and Counting in Crowds (Yi Wang, 2020) View paper
  - Structured 3D Scene Understanding (1 papers)
  - [19] SpatialLM: Training Large Language Models for Structured Indoor Modeling (Mao, 2025) View paper
  - Synthetic Data Augmentation (1 papers)
  - [33] Unsupervised Neural Sensor Models for Synthetic LiDAR Data Augmentation (Sallab, 2019) View paper
  - Fine-Tuning Foundation Models (1 papers)
  - [26] PointSAM: Pointly-Supervised Segment Anything Model for Remote Sensing Images (Nanqing Liu, 2025) View paper

Narrative

Core task: Oriented object detection from point annotations. The field addresses the challenge of training detectors that predict oriented bounding boxes when only point-level supervision is available, reducing annotation costs while maintaining detection accuracy. The taxonomy reveals several complementary research directions: Pseudo-Label Generation Methods focus on converting point annotations into complete box proposals through geometric reasoning and spatial constraints; Segmentation-Driven Detection Frameworks leverage intermediate segmentation masks to bridge the gap between points and boxes; Weakly Semi-Supervised Training Strategies combine limited point labels with unlabeled or fully-labeled data; Point-Based Representation and Localization explores direct prediction from point features without explicit box generation; Canonical Feature and Loss Design develops specialized architectures and training objectives for point-supervised scenarios; and Domain-Specific Applications and Extensions adapt these techniques to particular contexts like aerial imagery or vehicle detection. Representative works such as PointOBB[1], Oriented RepPoints[2], and Point-to-RBox Network[4] illustrate how different branches tackle the fundamental problem of inferring orientation and extent from minimal supervision.

A particularly active line of research centers on iterative refinement and relational reasoning within pseudo-label generation. Point2RBox-v3[0] exemplifies this direction by incorporating spatial layout and relational constraints to improve box proposals, positioning itself alongside Point2RBox-v2[9] and Relational Matching[20], which similarly exploit geometric relationships among detected objects. This contrasts with approaches like PointOBB-v2[11] and PMHO[3], which emphasize multi-scale feature aggregation or hybrid supervision strategies. The tension between purely point-driven methods and those integrating auxiliary signals—such as segmentation masks in PointSAM[26] or synthetic data in Point2RBox Synthetic[5]—remains a central theme. Point2RBox-v3[0] sits within the spatial-reasoning cluster, sharing with Semantic-decoupled Spatial[24] an emphasis on leveraging object layout, yet differing in how relational cues are formalized and integrated into the training pipeline. These variations highlight ongoing exploration of how best to extract maximal geometric information from minimal point annotations.

Related Works in Same Category

The following **3 sibling papers** share the same taxonomy leaf node with the original paper:

1. Point2rbox-v2: Rethinking point-supervised oriented object detection with spatial layout among instances

Authors: Yi Yu, Botao Ren, Peiyuan Zhang, Mingxin Liu, Junwei Luo, et al. (9 authors total) | **Year/Venue**: 2025 | **URL**: View paper

Abstract

With the rapidly increasing demand for oriented object detection (OOD), recent research involving weakly-supervised detectors for learning OOD from point annotations has gained great attention. In this paper, we rethink this challenging task setting with the layout among instances and present Point2RBox-v2. At the core are three principles: 1) Gaussian overlap loss. It learns an upper bound for each instance by treating objects as 2D Gaussian distributions and minimizing their overlap. 2) Vorono...

Relationship Analysis

Both papers belong to the Spatial Layout and Relational Constraints category, exploiting spatial relationships among instances for pseudo-label generation in point-supervised oriented object detection. Point2RBox-v2 introduces Voronoi tessellation and watershed algorithms to generate pseudo labels by leveraging spatial layout, while Point2RBox-v3 builds upon v2 by enhancing pseudo-label quality through Prior-Guided Dynamic Mask Loss (combining SAM and watershed) and improving utilization efficiency via Progressive Label Assignment for multi-level FPN assignment. The key distinction is that v3 extends v2's spatial layout approach with dynamic label assignment strategies and adaptive mask generation methods to address sparse/dense scene challenges.

---

2. Relational matching for weakly semi-supervised oriented object detection

Authors: Wenhao Wu, Hau-San Wong, Si Wu, Tianyou Zhang | **Year/Venue**: 2024 | **URL**: View paper

Abstract

â¦ To address the ambiguity problem from point annotations, we propose a Rotation-Modulated Relational Graph Matching method to align the contextual relations centered on the â¦

Relationship Analysis

Both papers belong to the Spatial Layout and Relational Constraints category, utilizing spatial relationships among instances for pseudo-label generation in oriented object detection from point annotations. The original paper (Point2RBox-v3) focuses on integrating Voronoi tessellation and watershed algorithms with SAM for mask-based pseudo-label refinement, while the candidate paper addresses weakly semi-supervised learning by matching relational graphs of proposals centered on annotated points between teacher-student models under augmented views. The key difference is that Point2RBox-v3 emphasizes static spatial partitioning methods (Voronoi/watershed) combined with SAM for mask generation, whereas the candidate paper leverages dynamic relational matching and graph-based consistency learning across different model views.

---

3. Semantic-decoupled Spatial Partition Guided Point-supervised Oriented Object Detection

Authors: Liu XinYuan, Xu Hang, Xinyuan Liu, Ma Yike, Hang Xu, et al. (12 authors total) | **Year/Venue**: 2025 | **URL**: View paper

Abstract

Recent remote sensing tech advancements drive imagery growth, making oriented object detection rapid development, yet hindered by labor-intensive annotation for high-density scenes. Oriented object detection with point supervision offers a cost-effective solution for densely packed scenes in remote sensing, yet existing methods suffer from inadequate sample assignment and instance confusion due to rigid rule-based designs. To address this, we propose SSP (Semantic-decoupled Spatial Partition), a...

Relationship Analysis

Both papers belong to the Spatial Layout and Relational Constraints category, exploiting spatial relationships among instances for pseudo-label generation in point-supervised oriented object detection. They overlap in using spatial partitioning techniques (Voronoi tessellation, watershed) to generate pseudo-labels from point annotations and address dense/sparse scene challenges. The key difference is that the original paper (Point2RBox-v3) focuses on progressive label assignment across FPN levels and dynamically selecting between SAM and watershed based on instance density, while the candidate paper (SSP) emphasizes semantic-decoupled spatial partition with region growing for sample assignment and introduces a two-stage pseudo-label framework with explicit positive/negative sample mining through spatial boundaries.

Contributions Analysis

Overall novelty summary. The paper introduces Progressive Label Assignment (PLA) and Prior-Guided Dynamic Mask Loss (PGDM-Loss) for point-supervised oriented object detection. It resides in the 'Spatial Layout and Relational Constraints' leaf under 'Pseudo-Label Generation Methods', alongside three sibling papers that similarly exploit spatial relationships through Voronoi tessellation, watershed, or graph matching. This leaf represents a focused research direction within the broader taxonomy of 40 papers across multiple branches, indicating a moderately populated area where spatial reasoning approaches are actively explored but not yet saturated.

The taxonomy reveals neighboring leaves including 'Multi-View Geometric Approaches' and 'Synthetic Pattern Knowledge Integration' within the same parent branch, plus 'SAM-Based Mask Proposal Methods' and 'Multi-Stage Segmentation Pipelines' in the adjacent 'Segmentation-Driven Detection Frameworks' branch. The paper's emphasis on combining watershed algorithms with SAM model advantages positions it at the intersection of spatial constraint methods and segmentation-driven approaches. The scope note for its leaf explicitly includes methods using Voronoi tessellation and watershed, while excluding those without explicit spatial partitioning, clarifying that Point2RBox-v3's relational modeling aligns with this category's core focus.

Among 13 candidates examined, the contribution-level analysis shows varied novelty profiles. Progressive Label Assignment examined 1 candidate with no refutations, suggesting limited prior work on dynamic label assignment in this context. Prior-Guided Dynamic Mask Loss examined 2 candidates with no refutations, indicating the hybrid watershed-SAM approach may be relatively unexplored. However, the extension to partially weakly-supervised detection examined 10 candidates and found 1 refutable match, suggesting this aspect has more substantial prior work within the limited search scope. The statistics reflect a targeted rather than exhaustive literature review.

Based on the limited search of 13 candidates, the work appears to introduce novel mechanisms for dynamic pseudo-label generation and hybrid loss design within the spatial constraint paradigm. The analysis covers top-K semantic matches and does not represent comprehensive field coverage. The taxonomy structure suggests the paper occupies a moderately active research direction with clear boundaries, though the full extent of related work in dynamic label assignment and SAM-watershed integration remains uncertain given the search scope.

This paper presents **3 main contributions**, each analyzed against relevant prior work:

Contribution 1: Progressive Label Assignment (PLA) for point-supervised oriented object detection

Description: The authors introduce Progressive Label Assignment, which dynamically estimates instance sizes and enables multi-level label assignment in Feature Pyramid Networks under weakly-supervised frameworks. This approach uses watershed-generated pseudo labels in early training stages and transitions to network-predicted boxes in later stages, revitalizing FPN usage in point-supervised detection.

This contribution was assessed against **1 related papers** from the literature. Papers with potential prior art are analyzed in detail with textual evidence; others receive brief assessments.

---

1. Level-wise Dynamic Label Assignment for Oriented Object Detection

URL: View paper

Brief Assessment

Level-wise Dynamic Label[48] addresses label assignment in fully-supervised settings with multi-scale anchors, while PLA operates in weakly-supervised point-annotation scenarios using dynamically generated pseudo labels from watershed and network predictions. The technical contexts and supervision paradigms differ fundamentally.

Contribution 2: Prior-Guided Dynamic Mask Loss (PGDM-Loss)

Description: The authors propose a hybrid loss function that dynamically routes images to either SAM or watershed branches based on instance density. For sparse scenes, SAM provides robust segmentation; for dense scenes, watershed is used. A prior-guided filtering mechanism selects optimal masks from SAM candidates using class-specific metrics.

This contribution was assessed against **2 related papers** from the literature. Papers with potential prior art are analyzed in detail with textual evidence; others receive brief assessments.

---

1. Neuromorphic Vision-Based Motion Segmentation With Graph Transformer Neural Network

URL: View paper

Brief Assessment

Neuromorphic Motion Segmentation[46] focuses on event-based motion segmentation using graph transformer neural networks for neuromorphic vision sensors, not on dynamic mask loss combining SAM and watershed for object detection in static images.

---

2. volER: Towards General-Purpose Endoplasmic Reticulum Segmentation from Volume Electron Microscopy

URL: View paper

Brief Assessment

volER[47] focuses on ER segmentation from electron microscopy using sparse convolution and domain fusion, not on dynamic routing between SAM and watershed for object detection in sparse versus dense scenes.

Contribution 3: Extension to partially weakly-supervised oriented object detection

Description: The authors demonstrate that their approach generalizes beyond pure point supervision by integrating it into the PWOOD framework for partially weakly-supervised scenarios. Experiments show consistent improvements when training with varying proportions of point-labeled data combined with unlabeled samples.

This contribution was assessed against **10 related papers** from the literature. Papers with potential prior art are analyzed in detail with textual evidence; others receive brief assessments.

---

1. Global focal learning for semi-supervised oriented object detection

URL: View paper

Brief Assessment

Global Focal Learning[41] focuses on semi-supervised learning with unlabeled data, not partially weakly-supervised scenarios combining point-labeled and unlabeled data as described in the original contribution.

---

2. P2rbox: Point prompt oriented object detection with SAM

URL: View paper

Brief Assessment

P2RBox SAM[22] focuses on point-supervised detection using SAM for mask generation and does not address partially weakly-supervised scenarios combining point-labeled and unlabeled data as described in the original contribution.

---

3. Point-based Weakly Semi-Supervised Oriented Vehicle Detection in Optical Remote Sensing Images

URL: View paper

Brief Assessment

Weakly Semi-Supervised Vehicle[6] focuses on vehicle detection in remote sensing using a teacher-student framework with point+OBB annotations, not the general PWOOD framework for partially weakly-supervised scenarios with point+unlabeled data that the original paper explores.

---

4. Afws: Angle-free weakly-supervised rotating object detection for remote sensing images

URL: View paper

Brief Assessment

AFWS[42] focuses on horizontal annotation-based weakly supervised detection, not point supervision with unlabeled data. The candidate does not address the PWOOD framework or partial supervision scenarios combining point-labeled and unlabeled samples.

---

5. Point2rbox: Combine knowledge from synthetic visual patterns for end-to-end oriented object detection with single point supervision

URL: View paper

Brief Assessment

Point2RBox Synthetic[5] focuses on single point supervision for oriented object detection using synthetic patterns and transform self-supervision. The paper does not address partially weakly-supervised scenarios combining point-labeled and unlabeled data, which is the core of the ORIGINAL paper's PWOOD framework extension.

---

6. A weak supervision learning paradigm for oriented ship detection in SAR image

URL: View paper

Brief Assessment

Weak Supervision Ship[44] focuses on horizontal bounding box (HBB) supervision for SAR ship detection, not point-and-unlabeled data scenarios. The original paper's PWOOD framework combines point-labeled and unlabeled samples, which is a different weakly-supervised paradigm.

---

7. Weakly Semi-Supervised Oriented Object Detection with Points

URL: View paper

Prior Art Analysis

Weakly Semi-Supervised Points[34] demonstrates prior work in partially weakly-supervised oriented object detection that combines point-labeled and unlabeled data. The candidate paper explicitly proposes a 'point-based weakly semi-supervised training strategy, which only requires the training set with an extremely small number (10%) of fully labeled images with obb and the other with points.' This directly

addresses the same problem space as the original paper's contribution. Both papers tackle the integration of point supervision with additional data (unlabeled in the original, partially labeled in the candidate) for oriented object detection, showing that the original authors were not the first to explore this partially weakly-supervised paradigm with point annotations.

Evidence

Evidence 1 - **Rationale**: The candidate paper explicitly proposes a weakly semi-supervised approach combining point annotations with a small number of fully labeled images, demonstrating prior work in the partially weakly-supervised paradigm that the original paper claims to extend to. - **Original**: we extend our method to partial weakly-supervised tasks (liu et al., 2025a) beyond point supervision, demonstrating its adaptability and scalability. - **Candidate**: this paper proposes a point-based weakly semi-supervised training strategy, which only requires the training set with an extremely small number (10%) of fully labeled images with obb and the other with points.

Evidence 2 - **Rationale**: Both papers employ self-training pipelines for partially weakly-supervised scenarios. The candidate's P2ONet generates pseudo-labels from point annotations in a semi-supervised setting, similar to the original paper's approach of integrating point supervision with unlabeled data. - **Original**: We integrated this method into the "partially weakly supervised oriented object detection",i.e. pwood framework (liu et al., 2025a), to demonstrate the universality and practicality of our approach. The operating principle of this framework is to train the model using a small portion of weakly label... - **Candidate**: following the common self-training pipeline, we propose point to obb network (p2onet) as the teacher model to generate the high-quality pseudo obb for each point-annotated object.

Evidence 3 - **Rationale**: Both papers experiment with 10% labeled data scenarios on DOTA, demonstrating that the candidate paper already explored the partially weakly-supervised setting with point annotations that the original paper claims as an extension. - **Original**: on the dota-v1.0 dataset with only 10% point-labeled data, our method increased the ap50 from 42.35% to 50.67%, an improvement of 8.32% - **Candidate**: this paper proposes a point-based weakly semi-supervised training strategy, which only requires the training set with an extremely small number (10%) of fully labeled images with obb and the other with points. specifically, following the common self-training pipeline, we propose point to obb network...

---

8. Pmho: Point-supervised oriented object detection based on segmentation-driven proposal generation

URL: View paper

Brief Assessment

PMHO[3] focuses exclusively on point-supervised detection with a five-stage pipeline (point-mask-HBB-OBB), without any extension to partially weakly-supervised scenarios combining point-labeled and unlabeled data.

---

9. Sood++: Leveraging unlabeled data to boost oriented object detection

URL: View paper

Brief Assessment

SOOD++[43] focuses on semi-supervised learning with unlabeled data, not partially weakly-supervised scenarios with point annotations. The original paper's PWOOD framework integration represents a distinct contribution.

---

10. H2rbox: Horizontal box annotation is all you need for oriented object detection

URL: View paper

Brief Assessment

H2RBox[45] focuses on horizontal box annotation-based oriented object detection using weakly-supervised learning from horizontal boxes only. The original paper extends point supervision to partially weakly-supervised scenarios with point-labeled and unlabeled data, which is a different supervision paradigm.

Appendix: Text Similarity Detection

Textual similarity detection checked 16 papers and found 5 similarity segment(s) across 2 paper(s).

The following **2 paper(s)** were detected to have high textual similarity with the original paper. These may represent different versions of the same work, duplicate submissions, or papers with substantial textual overlap. Readers are advised to verify these relationships independently.

1. Point2rbox-v2: Rethinking point-supervised oriented object detection with spatial layout among instances

Detected in: Core Task (sibling)

⚠ **Note**: This paper shows substantial textual similarity with the original paper. It may be a different version, a duplicate submission, or contain significant overlapping content. Please review carefully to determine the nature of the relationship.

---

2. Point2rbox: Combine knowledge from synthetic visual patterns for end-to-end oriented object detection with single point supervision

Detected in: Contribution: contribution_3

⚠ **Note**: This paper shows substantial textual similarity with the original paper. It may be a different version, a duplicate submission, or contain significant overlapping content. Please review carefully to determine the nature of the relationship.

References

- [0] Point2RBox-v3: Self-Bootstrapping from Point Annotations via Integrated Pseudo-Label Refinement and Utilization View paper
- [1] Pointobb: Learning oriented object detection via single point supervision View paper
- [2] Oriented reppoints for aerial object detection View paper
- [3] Pmho: Point-supervised oriented object detection based on segmentation-driven proposal generation View paper
- [4] Point-to-RBox Network for Oriented Object Detection via Single Point Supervision. View paper
- [5] Point2rbox: Combine knowledge from synthetic visual patterns for end-to-end oriented object detection with single point supervision View paper
- [6] Point-based Weakly Semi-Supervised Oriented Vehicle Detection in Optical Remote Sensing Images View paper
- [7] Pointobb-v3: Expanding performance boundaries of single point-supervised oriented object detection View paper
- [8] Semantic Segmentation Everything Model for Pointâ□Prompted Oriented Object Detection View paper
- [9] Point2rbox-v2: Rethinking point-supervised oriented object detection with spatial layout among instances View paper
- [10] Two-click based Fast Small Object Annotation in Remote Sensing Images View paper
- [11] Pointobb-v2: Towards simpler, faster, and stronger single point supervised oriented object detection View paper
- [12] Point-based estimator for arbitrary-oriented object detection in aerial images View paper
- [13] SPA: Annotating Small Object with a Single Point in Remote Sensing Images View paper

- [14] Rotated points for object detection in remote sensing images View paper
- [15] Point-Supervised Oriented Ship Detection via Segment Anything Model for SAR Images View paper
- [16] Wholly-WOOD: Wholly Leveraging Diversified-quality Labels for Weakly-supervised Oriented Object Detection View paper
- [17] Partial Weakly-Supervised Oriented Object Detection View paper
- [18] OSKDet: Orientation-sensitive keypoint localization for rotated object detection View paper
- [19] SpatialLM: Training Large Language Models for Structured Indoor Modeling View paper
- [20] Relational matching for weakly semi-supervised oriented object detection View paper
- [21] Projecting Points to Axes: Oriented Object Detection via Point-Axis Representation View paper
- [22] P2rbox: Point prompt oriented object detection with SAM View paper
- [23] PointOOD: Point-supervised remote sensing oriented object detection via canonical feature fusion and dynamic radius sampling View paper
- [24] Semantic-decoupled Spatial Partition Guided Point-supervised Oriented Object Detection View paper
- [25] Spectrum-oriented Point-supervised Saliency Detector for Hyperspectral Images View paper
- [26] PointSAM: Pointly-Supervised Segment Anything Model for Remote Sensing Images View paper
- [27] Instance-Level Orientation Enhancement for Horizontal Box Supervised Oriented Object Detection in Remote Sensing Images View paper
- [28] Pointflow: Point Supervised Video Object Detection View paper
- [29] Oriented Object Detection by Searching Corner Points in Remote Sensing Imagery View paper
- [30] Optimized Point Set Representation for Oriented Object Detection in Remote-Sensing Images View paper
- [31] RotPointNet: Keypoint based Oriented Object Detection for Aerial Image View paper
- [32] S^{2}Teacher: Step-by-step Teacher for Sparsely Annotated Oriented Object Detection View paper
- [33] Unsupervised Neural Sensor Models for Synthetic LiDAR Data Augmentation View paper
- [34] Weakly Semi-Supervised Oriented Object Detection with Points View paper
- [35] Weakly Semi-Supervised Oriented with Points for Remote Sensing Vehicle Detection View paper
- [36] Semantic-spatial Coupled Segmentation Everything Model for Point-prompted Oriented Object Detection View paper
- [37] Improving the Detection of Small Oriented Objects in Aerial Images View paper
- [38] A Self-Training Approach for Point-Supervised Object Detection and Counting in Crowds View paper
- [39] P2RBox: A Single Point is All You Need for Oriented Object Detection View paper
- [40] RSDet++: Point-Based Modulated Loss for More Accurate Rotated Object Detection View paper
- [41] Global focal learning for semi-supervised oriented object detection View paper
- [42] Afws: Angle-free weakly-supervised rotating object detection for remote sensing images View paper
- [43] Sood++: Leveraging unlabeled data to boost oriented object detection View paper
- [44] A weak supervision learning paradigm for oriented ship detection in SAR image View paper
- [45] H2rbox: Horizontal box annotation is all you need for oriented object detection View paper
- [46] Neuromorphic Vision-Based Motion Segmentation With Graph Transformer Neural Network View paper
- [47] volER: Towards General-Purpose Endoplasmic Reticulum Segmentation from Volume Electron Microscopy View paper
- [48] Level-wise Dynamic Label Assignment for Oriented Object Detection View paper