

# Scaling and Sizing Examples

1. Scale: 0.1x



**CADSpotting: Robust Panoptic Symbol Spotting on Large-Scale CAD Drawings**

Jianyu Ma<sup>1,2\*</sup> Fuyi Yang<sup>1,2†</sup> Yanshan Zhang<sup>2</sup> Junxiang Zhang<sup>1,2</sup> Yongjian Luo<sup>1</sup>  
Lan Xu<sup>1</sup> Yujiao Shi<sup>1,2</sup> Yingliang Zhang<sup>2</sup>  
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Figure 1. Our CADSpotting method accurately identifies and segments symbols in CAD drawings, enhancing tasks like 3D interior modeling. It also performs semantic learning from CAD drawings to identify symbols in other drawings.

**Abstract**  
We introduce CADSpotting, an effective method for robust panoptic symbol spotting in large-scale architectural CAD drawings. Existing approaches struggle with symbol detection due to complex geometry and overlapping elements in CAD designs. CADSpotting overcomes these challenges by proposing a novel Sliding Window Aggregation (SWA) technique, combining weighted voting and Non-Maximum Suppression (NMS). Moreover, we introduce LS-CAD, a new large-scale CAD dataset to support our experiments.

\* Equal contribution.  
† Corresponding author.

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**CAD Drawing Input** **Dense Feature Learning** **Spotting & 3D Interior Modeling**

Figure 1. Our CADSpotting method accurately identifies and segments symbols in CAD drawings, enhancing tasks like 3D interior modeling. It also performs semantic learning from CAD drawings to identify symbols in other drawings.

with each floorplan covering around 1,000 m<sup>2</sup>, significantly larger than previous benchmarks. Experiments on FloorPlan3D show that our method outperforms existing methods during inference for efficient panoptic symbol spotting in large-scale drawings. Finally, our method automatically performs 3D interior reconstruction by assembling architectural 3D objects guided by semantic information from CAD drawings.

3. Scale: 0.3x

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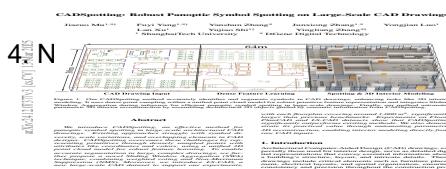
\* Equal contribution.  
† Corresponding author.

1. Introduction

Architectural Aided Design (CAD) drawings, especially those used for interior design, serve as detailed digital representations that convey essential information about buildings and their internal structures.

These drawings include critical elements such as furniture placement, electrical layouts, and spatial organization, ensuring accuracy and efficiency in the design and construction process.

For instance, the Shanghai Mercedes-Benz Arena utilizes over 3,000 CAD drawings to guide its structural design.



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5. Non-uniform: Tall (0.1x, 0.3x)



**CADDrawing Input** **Dense Feature Learning** **Symbol & Room Voting**

Figure 1. Our CADDrawing Input stage takes a large-scale CAD drawing as input and performs dense feature learning to extract semantic features. The Dense Feature Learning stage generates a feature map where each pixel corresponds to a specific symbol or room category. The Symbol & Room Voting stage then aggregates these features using a sliding window approach to produce the final segmentation results.

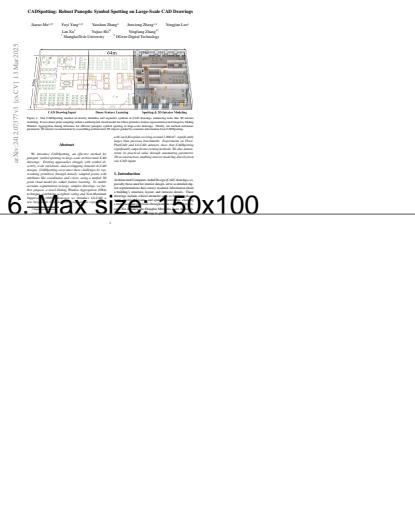
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6. Max size: 150x100



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7. Max size: 100x100 (square)



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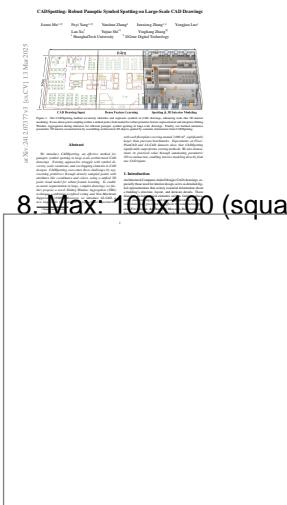
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8. Max: 100x100 (square)



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