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Microsoft CMT <email@msr-cmt.org>   Jan 3, 2025, 4:27 P
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Hello,

The following submission has been created.

Track Name: Track 6: Environment & Green Buildings

Paper ID: 188

Paper Title: Integration of yolov5 with Siamese networks for enhanced microplastic detection through flu

Abstract:
Microplastics (MP) are persistent environmental pollutants that pose significant risks to ecosystems and
introduces a hybrid detection model that integrates YOLOv5 with a lightweight Siamese Neural Network (SN
fluorescence microscopy images. YOLOv5 identifies candidate regions, whereas the SNN performs refined cl
based learning, addressing challenges such as class imbalance and deformable shapes. Experimental result
model's superior performance, achieving precision (0.938), recall (0.930), F1score (0.927), and mean Ave
outperforming Mask Region-Convolutional Neural Network (MRCNN) (F1-score: 0.846, mAP50: 0.858) and Faste
Network (FRCNN) (F1-score: 0.568, mAP50: 0.865). Comparative analysis also showed the robustness of the
YOLOv11, which achieved lower mAP50 values of 0.648 and 0.779, respectively. Leveraging the unique color