

PENGEMBANGAN MODEL *DEEP LEARNING* YOLOv8 UNTUK PEMETAAN *OUTDOOR ADVERTISING* DALAM LINGKUNGAN URBAN MENGGUNAKAN *STREET VIEW*

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INTISARI

Outdoor advertising telah menjadi kontributor utama polusi visual di lingkungan urban, menimbulkan kebutuhan mendesak akan pengawasan dan penertiban yang efektif. Metode konvensional seperti survei lapangan terbukti tidak efektif karena keterbatasan sumber daya. Penelitian ini bertujuan untuk mengembangkan model *deep learning* YOLOv8 guna mendeteksi dan memetakan *outdoor advertising* sebagai objek polusi visual di lingkungan urban dengan memanfaatkan panorama Google *Street View*. Studi dilakukan di empat koridor komersial di Daerah Istimewa Yogyakarta, yaitu Jalan Affandi, Jalan Kaliurang, Jalan Monjali, dan Jalan Magelang. Pelatihan dan implementasi model YOLOv8s dilakukan melalui Google Colaboratory Pro. Hasil pelatihan model YOLOv8 yang dilatih dengan *custom* dataset mencapai mAP@0.5 sebesar 0,87 dan mAP@0.5-0.95 sebesar 0,694 dan berhasil mendeteksi 3.194 *outdoor advertising* di area kajian, mencakup, baliho, *billboard*, papan nama, reklame berjalan, spanduk, dan Videotron. Uji validasi terhadap dataset *test set* menunjukkan performa yang kurang optimal dengan mAP@0.5-0.95 sebesar 0,115, mengindikasikan adanya *underfitting*. Pemetaan hasil deteksi menggunakan model ZoeDepth dan perhitungan *spherical trigonometry* menghasilkan RMSE sebesar 1.249,75 meter, menunjukkan ketidakakuratan dalam pemetaan.

Kata Kunci: *Outdoor Advertising, Object Detection, YOLO, Street View*

DEVELOPMENT OF THE YOLOv8 DEEP LEARNING MODEL FOR MAPPING OUTDOOR ADVERTISING IN URBAN ENVIRONMENTS USING STREET VIEW

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ABSTRACT

Outdoor advertising has become a major contributor to visual pollution in urban environments, creating an urgent need for effective monitoring and policing. Conventional methods such as field surveys have proven ineffective due to limited resources. This research aims to develop a deep learning model YOLOv8 to detect and map outdoor advertising as an object of visual pollution in urban environments by utilizing Google Street View panoramas. The study was conducted in four commercial corridors in Yogyakarta Special Region, namely Affandi Street, Kaliurang Street, Monjali Street, and Magelang Street. Training and implementation of the YOLOv8s model were conducted through Google Collaboratory Pro. The training results of the YOLOv8 model trained with custom datasets reached $mAP@0.5$ of 0.87 and $mAP@0.5-0.95$ of 0.694 and successfully detected 3,194 outdoor advertisements in the study area, including, baliho, billboard, papan nama, reklame berjalan, spanduk, and videotron. The validation test against the test set dataset showed less than optimal performance with $mAP@0.5-0.95$ of 0.115, indicating underfitting. Mapping the detection results using the ZoeDepth model and spherical trigonometry calculations resulted in an RMSE of 1.249,75 meters, indicating inaccuracies in the mapping.

Keywords: Outdoor Advertising, Object Detection, YOLO, Street View