Semi-Supervised Pedestrian Instance Synthesis and Detection with Mutual Reinforcement

**ABSTRACT**

We propose a GAN-based scene-specific instance synthesis and classification model for semi-supervised pedestrian detection. Instead of collecting unreliable detections from unlabeled data, we adopt a class-conditional GAN for synthesizing pedestrian instances to alleviate the problem of insufficient labeled data. With the help of a base detector, we integrate pedestrian instance synthesis and detection by including a post-refinement classifier (PRC) into a minimax game. A generator and the PRC can mutually reinforce each other by synthesizing high-fidelity pedestrian instances and providing more accurate categorical information. Both of them compete with a class-conditional discriminator and a class-specific discriminator, such that the four fundamental networks in our model can be jointly trained. In our experiments, we validate that the proposed model significantly improves the performance of the base detector and achieves state-of-the-art results on multiple benchmarks. The result indicates the possibility of using inexpensively synthesized instances for improving semi-supervised detection models.

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Supervisor: Dr. WONG Hau San

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All are welcome!

In case of questions, please contact Dr. WONG Hau San at Tel: 3442 8624, E-mail: cshswong@cityu.edu.hk, or visit the CS Departmental Seminar Web at http://www.cs.cityu.edu.hk/news/seminars/seminars.html.