1. Motivation

Background
- Occlusion distribution of Caltech Pedestrian dataset. Over 97% of occluded pedestrians belong to a small subset of hundreds of possible occlusion types.
- Occlusion types may vary in different scenes.

Idea
- Part Detector Pool. We construct a detector pool which includes part detectors of all sizes and positions.
- Part Selecting. We select significant and complement part detectors in different scenes or datasets.

2.2. Handling Shifted Proposals

- Fully Convolutional Neural Network. Reformulate the fully connected layers as convolutional layers.
- Expanded Proposal. Given a proposal \((x_{min}, y_{min}, w, h)\), crop it as \((x'_{min}, y'_{min}, w', h')\), where
  \[
  x'_{min} = x_{min} + \frac{16n}{227} \times w, \\
  y'_{min} = y_{min} + \frac{16n}{227} \times h, \\
  w' = (1 + \frac{32n}{227} \times w, \\
  h' = (1 + \frac{32n}{227} \times h).
  \]
- Score Adjustment. The final score of this proposal is adjusted by
  \[
  s = \max_{1 \leq i, j \leq 4} \{ S_{ij} - P_{ij} \}
  \]
  \[
  P_{ij} = a \times (i - \frac{n + 2}{2}) + (j - \frac{n + 2}{2}) \times \frac{32}{227}, \\
  + b \times (i - \frac{n + 2}{2})^2 + (j - \frac{n + 2}{2})^2 \times \frac{32}{227}
  \]

2.3. Complementary Parts

- Complementary Parts. Combine part scores; Select significant parts according to combinational weights; Re-learn the complementary weights.

3. Results

- Effectiveness of Part Detectors
- Overall Results
- Reasonable Subset
- KITTI