Algorithm 1 Calculation of EfficientDet anchors' hyperparameters

Require: List of bounding boxes $B_1, B_2, \ldots, B_n$

Ensure: List of aspect ratios and scales for EfficientDet anchors

Calculate the k shapes of anchors using K-means with the Jaccard distance metric on the list of bounding boxes:

$IOU(B_i, A_j) = \frac{area(B_i \cap A_j)}{area(B_i \cup A_j)}$

$D_{ij} = 1 - \frac{area(B_i \cap A_j)}{area(B_i \cup A_j)}$

$A_1, A_2, \ldots, A_k \leftarrow$ K-means$(B_1, B_2, \ldots, B_n,\ D,\ k)$

Calculate aspect ratios:

$aspectratio_j = \frac{height(A_j)}{width(A_j)}$

Calculate scales:

$s_i = \max(width(B_i), height(B_i))$

$T_{A_i} = \arg\min |size(T_j) - s_i|$, where $T_j \in 32, 64, 128, 256, 512$

$scale_i = \frac{\max(width(A_i), height(A_i))}{size(TA_i)}$

Merge similar scales:

$S = scale_1, scale_2, \ldots, scale_k$

Sort S in increasing order j $\leftarrow 1$

while $j < |S|$:

$q \leftarrow j + 1$

while $q \leq |S|$ and $\frac{S_q}{S_j} < merge\_threshold$:

$q \leftarrow q + 1$

$scale_j \leftarrow \frac{\sum i=j^{q-1} S_i}{q-j}$

$j \leftarrow q$

return $aspectratio_1, aspectratio_2, \ldots, aspectratio_k$, scale$_1, scale_2, \ldots, scale_k$