Pseudo-codes

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1 Fréchet Inception Distance

Algorithm 1 Fréchet Inception Distance

$A^{real} \leftarrow Net_{inception}(x_{real})$
$A^{gen} \leftarrow Net_{inception}(x_{gen})$
$\mu_{real} \leftarrow mean(A^{real})$
$\mu_{gen} \leftarrow mean(A^{gen})$
$\sigma_{real} \leftarrow covariance(A^{real})$
$\sigma_{gen} \leftarrow covariance(A^{gen})$
$ssdiff \leftarrow \sum_{i=1}^{n} (\mu_{real} - \mu_{gen})^2$
$covmean \leftarrow \sqrt{\sigma_{real} \cdot \sigma_{gen}}$
$fid \leftarrow ssdiff + trace(\sigma_{real} + \sigma_{gen} - 2covmean)$

2 Comparative Alignment Score

Algorithm 2 Comparative Alignment Score

function COMPARATIVE ALIGNMENT SCORE
    $score_{real} \leftarrow AbsoluteAlignmentScore(layouts_{real})$
    $score_{gen} \leftarrow AbsoluteAlignmentScore(layouts_{gen})$
    return $score_{comp} \leftarrow |\log \frac{score_{gen}+1e^{-10}}{score_{real}+1e^{-10}}|$
end function
function ABSOLUTE ALIGNMENT SCORE(layouts, width$_{layouts}$)
    $mins_{dataset} \leftarrow EmptyList$
    for $i = 1, 2, \ldots, N_{layouts}$ **do**
        $mins_{layout} \leftarrow EmptyList$
        for $j = 1, 2, \ldots, N_{assets}$ **do**
            $mins_{asset} \leftarrow EmptyList$
            for $k = 1, 2, \ldots, N_{assets}$ **do**
                $distance_{jk}^{left} \leftarrow |asset_j.left - asset_k.left|$
                $distance_{jk}^{center} \leftarrow |asset_j.center - asset_k.center|$
                $distance_{jk}^{right} \leftarrow |asset_j.right - asset_k.right|$
                $mins_{asset}[k] \leftarrow min(distance_{jk}^{left}, distance_{jk}^{center}, distance_{jk}^{right})$
            end for
            $mins_{layout}[j] \leftarrow min(mins_{asset})/width$
        end for
        $mins_{dataset}[i] \leftarrow min(mins_{layout})$
    end for
    return $\frac{1}{N_{layouts}} min(mins_{dataset})$
end function

3 Comparative Overlap Score

Algorithm 3 Comparative Overlap Score

function COMPARATIVE OVERLAP SCORE
  $score_{real} \leftarrow AbsoluteOverlapScore(layouts_{real})$
  $score_{gen} \leftarrow AbsoluteOverlapScore(layouts_{gen})$
  return $score_{comp} \leftarrow |\log \frac{score_{gen}+1e^{-10}}{score_{real}+1e^{-10}}|$
end function
function ABSOLUTE OVERLAP SCORE(layouts, width$_{layouts}$, $height_{layouts}$)
  $s \leftarrow 0$
  for $i = 1, 2, \ldots, N_{layouts}$ **do**
    for $j = 1, 2, \ldots, N_{assets}$ **do**
      for $k = 1, 2, \ldots, N_{assets}$ **do**
        if $j < k$ **then**
          $max_{left} \leftarrow max(asset_j.left, asset_k.left)$
          $max_{top} \leftarrow max(asset_j.top, asset_k.top)$
          $min_{right} \leftarrow min(asset_j.right, asset_k.right)$
          $min_{low} \leftarrow min(asset_j.low, asset_k.low)$
          $dw \leftarrow min_{right} - max_{left}$
          $dh \leftarrow min_{low} - max_{top}$
          $area_{jk} \leftarrow 0$
          if $dw > 0$ & $dh > 0$ **then** $area_{jk} \leftarrow dw.dh$
          end if
          $s \leftarrow s + \frac{area_{jk}}{width_{layouts}.height_{layouts}}$
        end if
      end for
    end for
  end for
  return $\frac{1}{N_{layouts}} s$
end function

4 Comparative Diversity Score

Algorithm 4 Comparative Diversity Score

function COMPARATIVE DIVERSITY SCORE
  $score_{real} \leftarrow AbsoluteDiversityScore(layouts_{real})$
  $score_{gen} \leftarrow AbsoluteDiversityScore(layouts_{gen})$
  return $score_{comp} \leftarrow |\log \frac{score_{gen}+1e^{-10}}{score_{real}+1e^{-10}}|$
end function
function ABSOLUTE DIVERSITY SCORE(layouts, width$_{layouts}$)
  $\sigma \leftarrow EmptyMatrix$
  for $i = 1, 2, \ldots, N_{features}$ **do**
    for $j = 1, 2, \ldots, N_{assets}$ **do**
      $\sigma_{i,j} \leftarrow \sqrt{\frac{1}{N_{layouts}-1} \sum_{k=1}^{N_{layouts}} (feat_{ijk} - \overline{feat_{ij}})^2}$
      if $feature_i == left || feature_i == widht$ **then** $\sigma_{i,j} \leftarrow \frac{1}{width_{layouts}}.\sigma_{i,j}$
      end if
      if $feature_i == top || feature_i == height$ **then** $\sigma_{i,j} \leftarrow \frac{1}{width_{layouts}}.\sigma_{i,j}$
      end if
    end for
  end for
  return $min_{ij}(\sigma_{i,j})$
end function