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**Algorithm 1** Lightweight rendering of large crowd

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**Input:**

```

vertexInf={ position, skinIndex ,coordinateUV }
avatarParameter={
    affineMatrix,
    animationType,
    animationSpeed,
    headTextureType,
    upperBodyTextureType,
    trousersTextureType,
    neckHeight,
    waistHeight,
}
BonesAffineMatrixs ;
animationPlayTime ;
projectionMatrix ; viewMatrix ; modelMatrix ;
textureMapping ;

```

**Output:**

```

vertexScreenCoordinate ;
fragmentColor ;

```

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```

1: if this bone have animation then
2:   frameIndex = (animationPlayTime * animationSpeed) mod frameIndexMax;
3: else
4:   frameIndex = 0;
5: end if
6: boneMatrix ← BonesAffineMatrixs[animationType][frameIndex];
7: vertexScreenCoordinate =
8:   projectionMatrix * viewMatrix * modelMatrix * affineMatrix * boneMatrix * position;
9: if vertexInf.position < waistHeight then
10:  textureType = headTextureType;
11: else if vertexInf.position < neckHeight then
12:  textureType = upperBodyTextureType;
13: else
14:  textureType = trousersBodyTextureType;
15: end if
16: fragmentColor ← textureMapping[textureType][coordinateUV];
17: return vertexScreenCoordinate , fragmentColor;

```

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