Algorithm 1 Calculate distance between fused object and sensor object

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procedure (ComputeDistanceAngleMatchProb)($fused\_object, sensor\_object$)

    $weight\_y \leftarrow 0.2f$
    $speed\_diff \leftarrow 5.0f$
    $epislon \leftarrow 0.1f$
    $angle\_tolerance \leftarrow 5.0f$
    $distance\_tolerance_max \leftarrow 5.0$
    $distance\_tolerance_min \leftarrow 2.0f$

    $fcenter \leftarrow fused\_object.center(x, y, z)$
    $scenter \leftarrow sensor\_object.center(x, y, z)$
    $euclid\_dist \leftarrow \sqrt{(fcenter)^2 + (scenter)^2}$

    if $((fcenter.x > epislon)\&\&|fcenter.y| > epislon)$ then $x\_ratio = \frac{|fcenter.x - scenter.x|}{fcenter.x}$ $y\_ratio = \frac{|fcenter.y - scenter.y|}{fcenter.y}$ $range\_distance\_ratio = weight_x * x_ratio + weight_y * y_ratio$
    else if $fcenter.x > epislon$ then $x\_ratio = \frac{|fcenter.x - scenter.x|}{fcenter.x}$ $range\_distance\_ratio = x_ratio$
    else if $|fcenter.y| > epislon$ then $y\_ratio = \frac{|fcenter.y - scenter.y|}{fcenter.y}$ $range\_distance\_ratio = y\_ratio$

    $distance \leftarrow range\_distance\_ratio$
    $sangle \leftarrow \tan \text{inverse} \frac{scenter.x}{scenter.y}$
    $fangle \leftarrow \tan \text{inverse} \frac{fcenter.x}{fcenter.y}$
    $angle\_distance\_diff \leftarrow \frac{|sangle - fangle| * 180}{\pi}$;
    $fobject\_dist \leftarrow \sqrt{(fcenter.x)^2 + (fcenter.y)^2 + (fcenter.z)^2}$
    $svelocity \leftarrow ||sensor\_object.velocity||$
    $fvelocity \leftarrow ||fused\_object.velocity||$

    if $svelocity > 0.0\&\&fvelocity > 0.0$ then $cos\_distance = \frac{sensor\_object.velocity\cdot.fused\_object.velocity}{||sensor\_object.velocity||*||fused\_object.velocity||}$
        if $cos\_distance > 0.5$ then $distance = \infty$

    if $(|svelocity - fvelocity| \geq speed\_diff)\&\&(angle\_distance\_diff \geq angle\_tolerance)$ then $distance = \infty$

    $distance\_allowed \leftarrow max(fobject_dist * \sin(angle\_distance\_diff), distance\_tolerance\_min)$

    if $euclid\_dist > distance\_allowed$ then $distance = \infty$
    return $distance$
```