base\_prob = math.exp(-(distance / max\_range)²)

**1. Radar Sensors**

1. **Altitude Factor**: altitude\_factor = 1.0 - 0.1 \* (uav\_altitude / 1000)
2. **Speed Factor**: speed\_factor = 0.9 + 0.1 \* min(uav\_speed / 20, 1.0)
3. **RCS Factor**: rcs\_factor = 0.95

Final radar probability: final\_prob = base\_prob \* altitude\_factor \* speed\_factor \* rcs\_factor

**2. RF (Radio Frequency) Sensors**

1. **Signal Factor**: signal\_factor = 1.0 - 0.3 \* (distance / max\_range)^1.5
2. **Speed Factor**: speed\_factor = 1.0
3. **Altitude Factor**: altitude\_factor = 1.0 - 0.05 \* (uav\_altitude / 500)

Final RF probability: final\_prob = base\_prob \* signal\_factor \* speed\_factor \* altitude\_factor

**3. LiDAR Sensors**

1. **Range Factor**: range\_factor = 1.0 - 0.5 \* (distance / max\_range)^1.2
2. **Speed Factor**: speed\_factor = 1.0 - 0.2 \* min(uav\_speed / 30, 1.0)
3. **Altitude Factor**: altitude\_factor = 1.0 - 0.2 \* (uav\_altitude / 300)

Final LiDAR probability: final\_prob = base\_prob \* range\_factor \* speed\_factor \* altitude\_factor

**Randomness Addition**

After applying sensor-specific modifiers, a small randomness factor is added:

randomness = max(0, min(1, np.random.normal(0, 0.05) + final\_prob))