
Algorithm 1 Object Detection Neutrosophic Traffic Decision Algorithm

- 1: Initialize model type $M \in \text{YOLOv5, YOLOv8, RetinaNet, SSD}$
 - 2: Load pretrained weights and configuration for model M
 - 3: Load traffic video/image dataset D
 - 4: Set Neutrosophic thresholds: Truth T , Indeterminacy I , Falsity F
 - 5: Set decision thresholds: $\tau_{\text{density}}, \tau_{\text{priority}}$
 - 6: **for** each frame f in D **do**
 - 7: Detect vehicles $V_f \leftarrow \text{ModelDetect}(M, f)$
 - 8: Classify objects by type: car, bike, bus, truck
 - 9: Count vehicles C_f and determine lane-based density
 - 10: Calculate Neutrosophic values T_f, I_f, F_f based on density, time, and motion
 - 11: Evaluate congestion score $S_f = \alpha T_f + \beta I_f + \gamma F_f$
 - 12: **if** $S_f \geq \tau_{\text{density}}$ **then**
 - 13: Update signal timing for frame f (e.g., extend green)
 - 14: Trigger alert or rerouting logic if accident or crowd detected
 - 15: **else**
 - 16: Maintain default traffic cycle
 - 17: **end if**
 - 18: Log results: vehicle count, decision, frame index
 - 19: **end for**
 - 20: Generate report: average congestion, response times, model accuracy
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