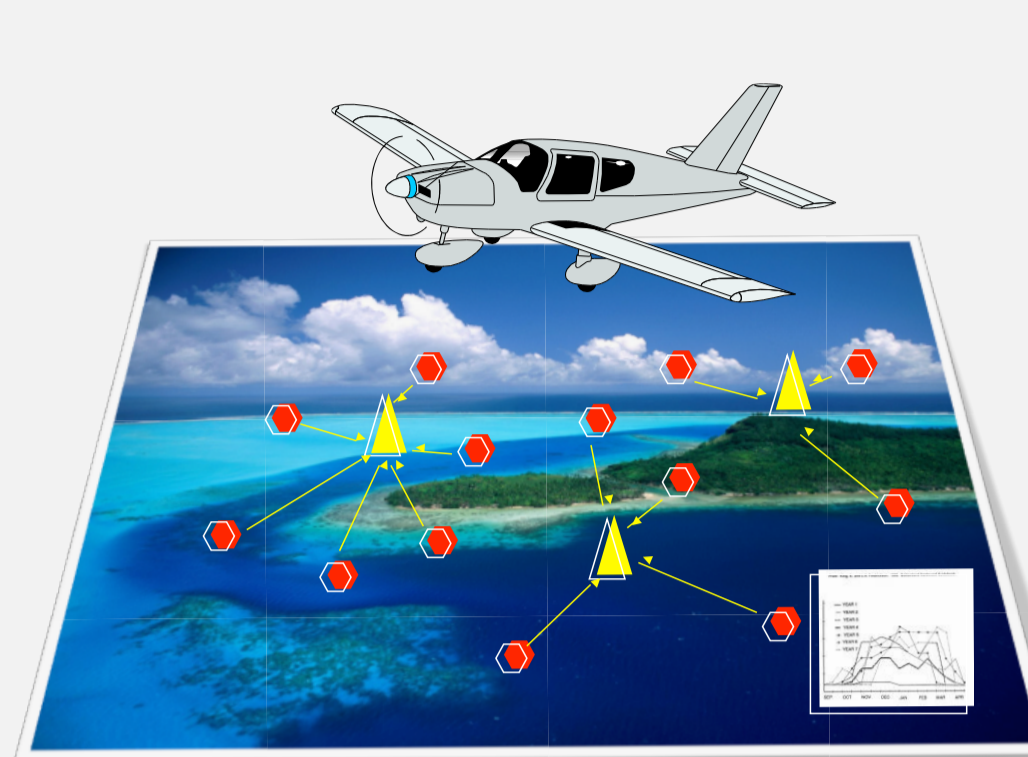


Adaptive Scheduling of Wireless Video Sensor Nodes for Surveillance Applications

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VIDEO SENSOR NETWORKS



- SENTRY NODE: NODE WITH HIGH SPEED CAPTURE (HIGH COVER SET).
- IDLE NODE: NODE WITH LOW SPEED CAPTURE.
- ALERTED NODE: NODE WITH HIGH SPEED CAPTURE (ALERT INTRUSION).
- SENTRY NODE: NODE WITH HIGH SPEED CAPTURE (HIGH COVER SET).
- CRITICAL NODE: NODE WITH HIGH SPEED CAPTURE (NODE THAT DETECTS THE INTUSION).
- IDLE NODE: NODE WITH LOW SPEED CAPTURE.

HIBERNATE MODE ALERT MODE HIBERNATE MODE (AFTER INTRUSION)

INTRUSION DETECTION

OBJECTIVE:
MAXIMIZE THE NETWORK LIFETIME AND THE COVERAGE AREA

OUR SOLUTION

DEFINE THE CRITICALITY LEVEL

○ r^0 MAX

NEED LOW FPS NEED HIGH FPS

AVOID REDUNDANCY: FINDING COVER SET

$A = \{v \in N(V) : v \text{ covers the point "a" of the FoV}\}$
 $B = \{v \in N(V) : v \text{ covers the point "b" of the FoV}\}$
 $C = \{v \in N(V) : v \text{ covers the point "c" of the FoV}\}$
 $G = \{v \in N(V) : v \text{ covers the point "g" of the FoV}\}$

$AG = \{A \cap G\}$
 $BG = \{B \cap G\}$
 $CG = \{C \cap G\}$
 $Co(v) = AG \times BG \times CG$

$Co(V) = \{V\}$
 $\{V1, V2, V3\}$

$Co(V) = \{V\}$
 $\{V2, V1\}$
 $\{V3, V1\}$
 $\{V2, V4, V5\}$
 $\{V3, V4, V5\}$

COMPUTING THE NODE'S FPS WRT:

- THE COVER SET SIZE $|Co(v)|$
- THE CRITICALITY r^0

FRAMES SECONDE HIGH CRITICAL APPLICATION LOW CRITICAL APPLICATION

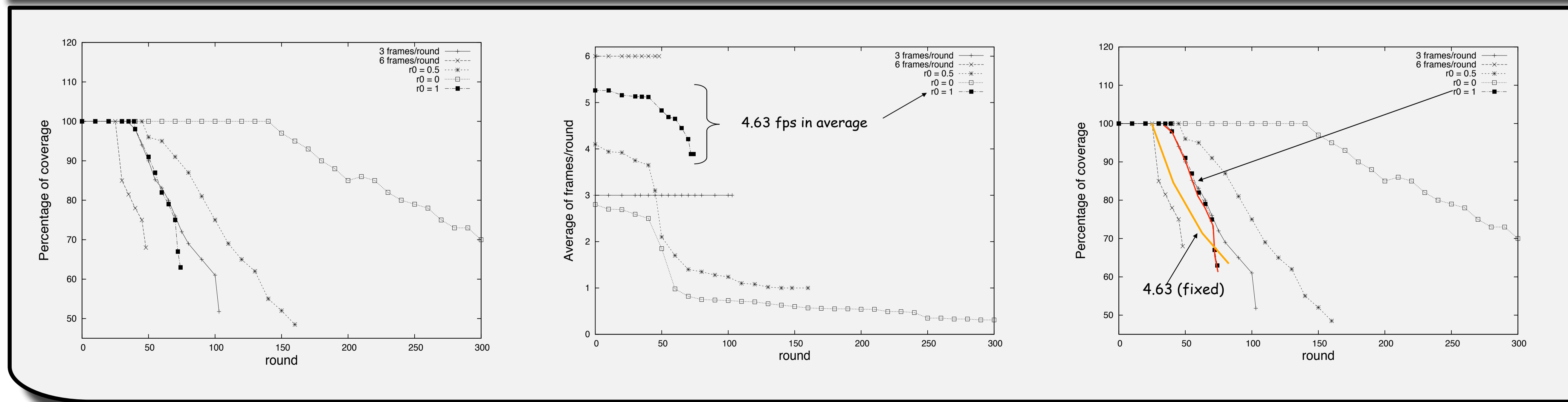
HIGH CRITICALITY: - CONVEX SHAPE - MOST PROJECTIONS OF X ARE CLOSE TO THE MAX CAPTURE SPEED

LOW CRITICALITY: - CONCAVE SHAPE - MOST PROJECTIONS OF X ARE CLOSE TO THE MIN CAPTURE SPEED

$|Co(v)| = 0$ V IS AN IDLE NODE

$|Co(v)| = MAX$ V IS AN SENTRY NODE

SIMULATIONS



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