Adaptive Scheduling of Wireless Video Sensor Nodes for Surveillance Applications

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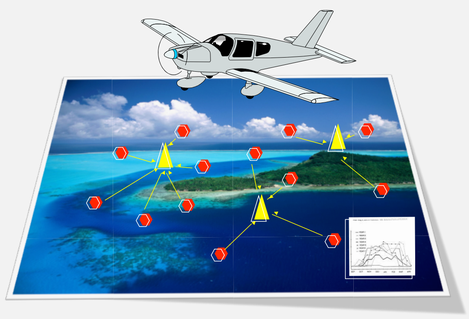
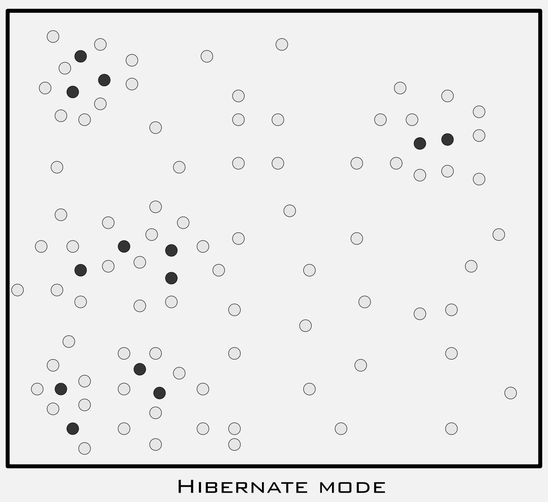
VIDEO SENSOR NETWORKS



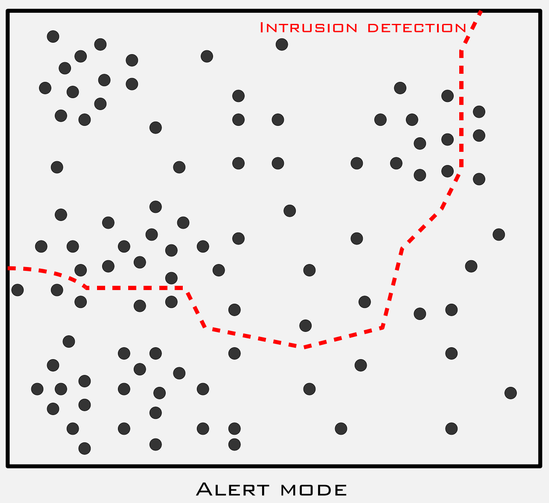
● **Sentry node:** node with high speed capture (high cover set).

○ **Idle node:** node with low speed capture.



Hibernate mode

● **Alerted node:** node with high speed capture (Alert intrusion).

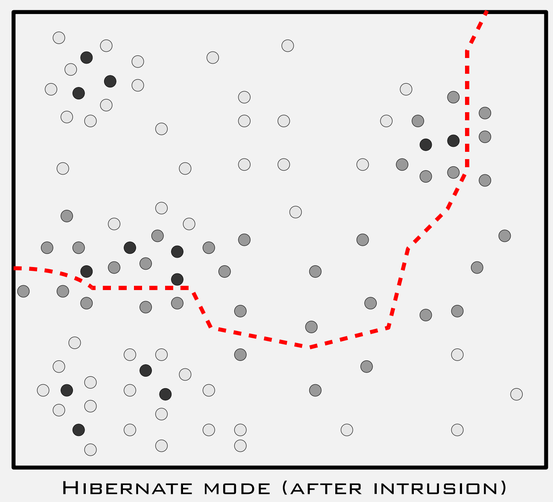


Alert mode

● **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.



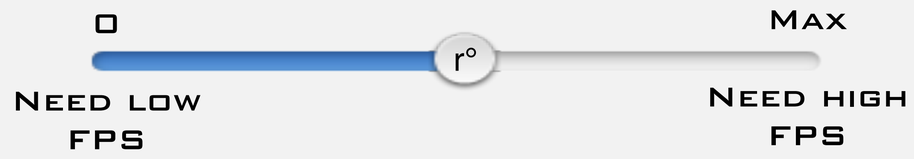
Hibernate mode (after intrusion)

Objective:

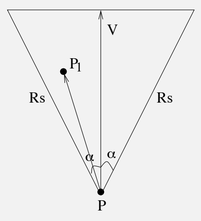
Maximize the network lifetime and the coverage area

OUR SOLUTION

Define the criticality level

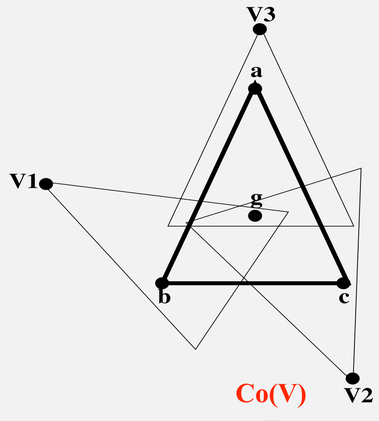


Avoid redundancy: finding cover set

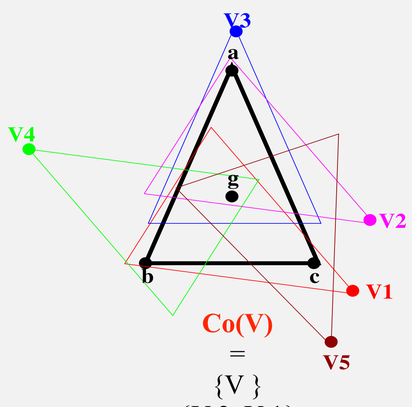


A = {v ∈ N(V) : v covers the point “a” of the FoV}
B = {v ∈ N(V) : v covers the point “b” of the FoV}
C = {v ∈ N(V) : v covers the point “c” of the FoV}
G = {v ∈ N(V) : v covers the point “g” of the FoV}

AG={A∩G}
BG={B∩G}
CG={C∩G}
Co(v)=AGxBGxCG



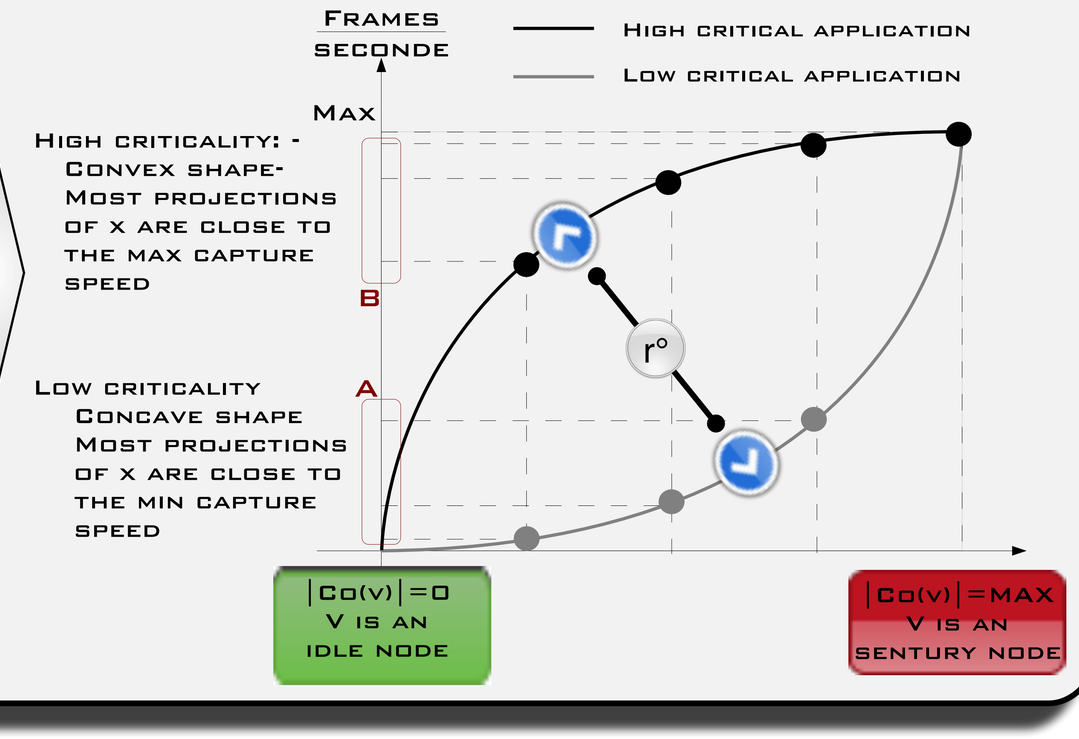
Co(V)
=
{V }
{V1, V 2, V3}



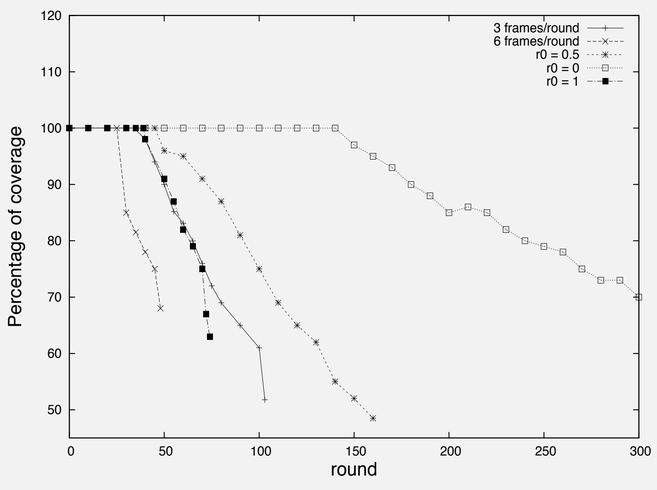
Co(V)
=
{V }
{V 2, V 1}
{V 3, V 1}
{V 2, V 4, V 5}
{V 3, V 4, V 5}

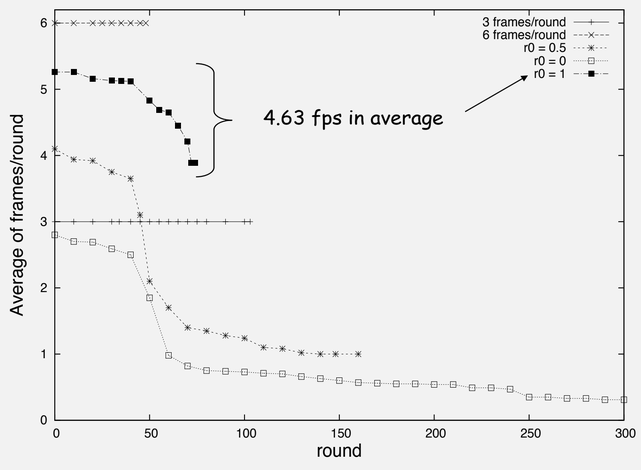
Computing the node's Fps wrt:

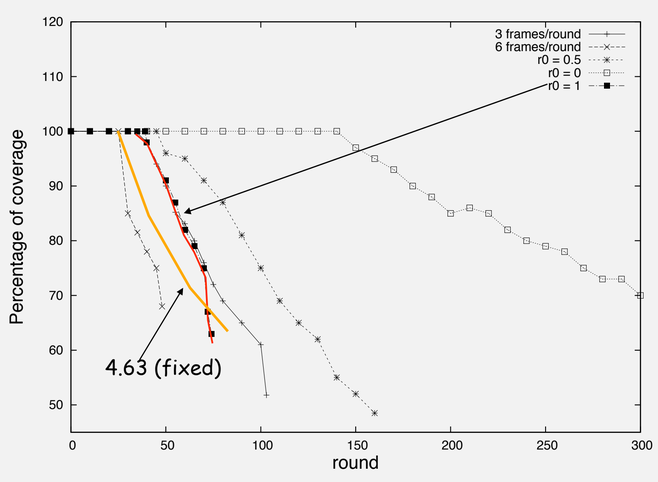
- the cover set size |Co(v)|
- the criticality r°



Simulations







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