Implementation of Control Systems to Sustain Autonomous Robot Motion

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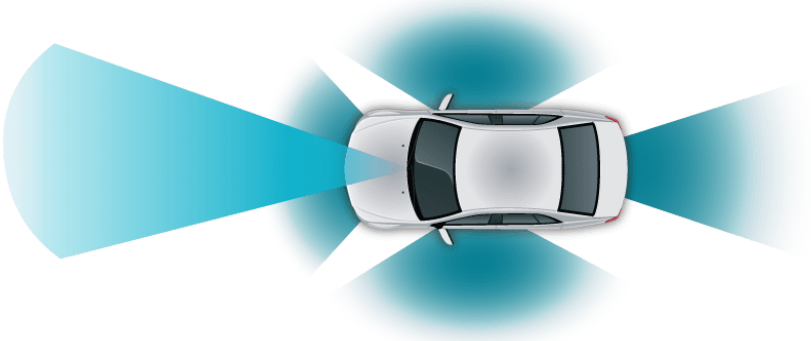
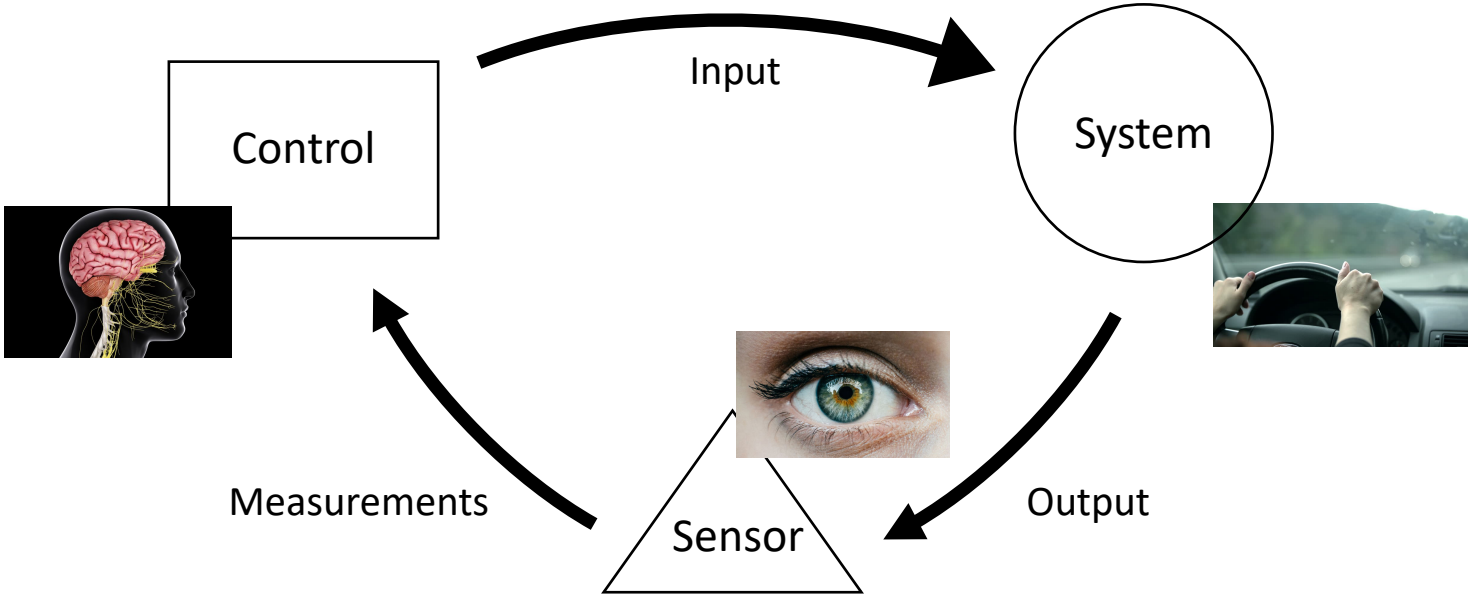
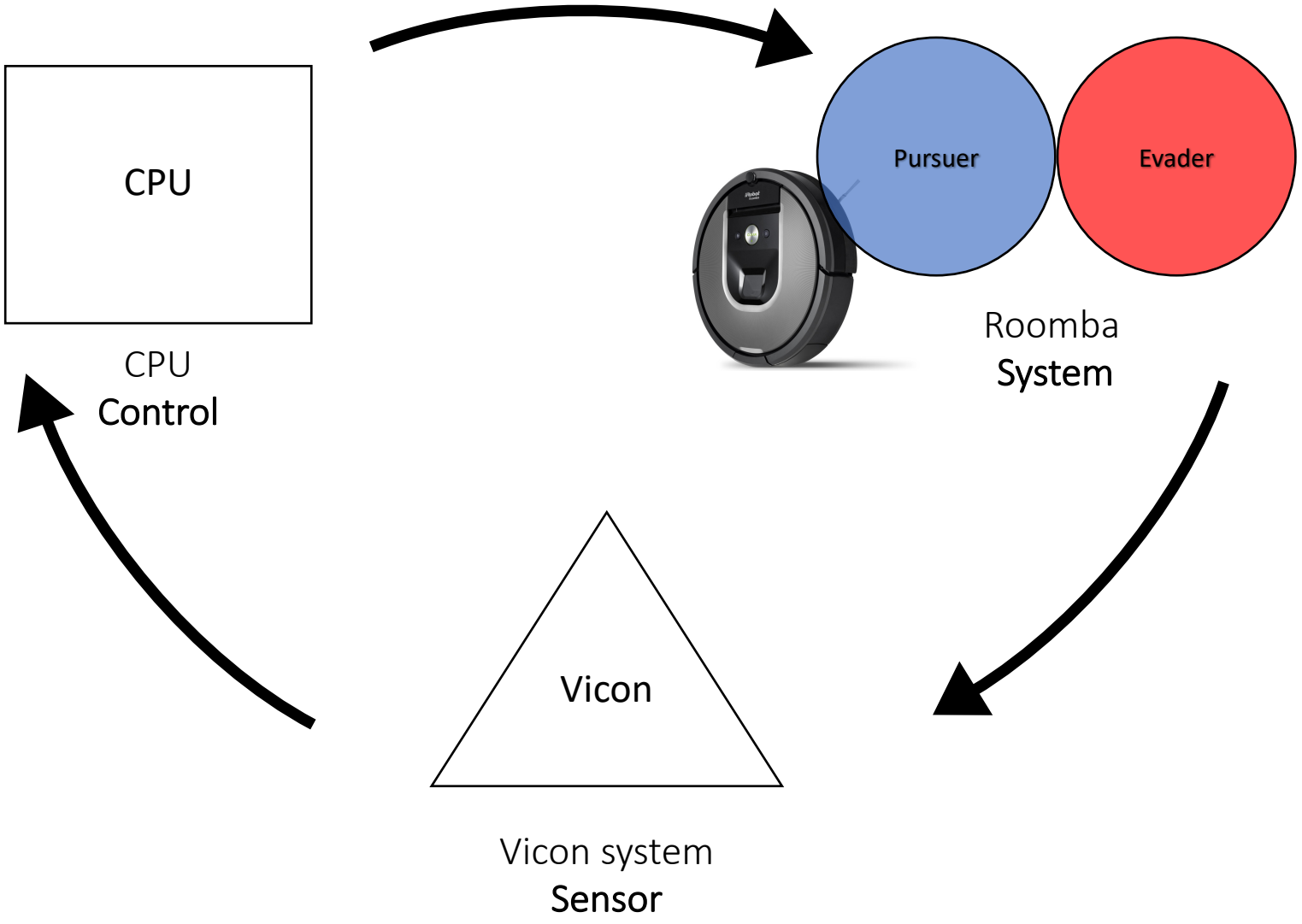
Control systems are widely used in daily life

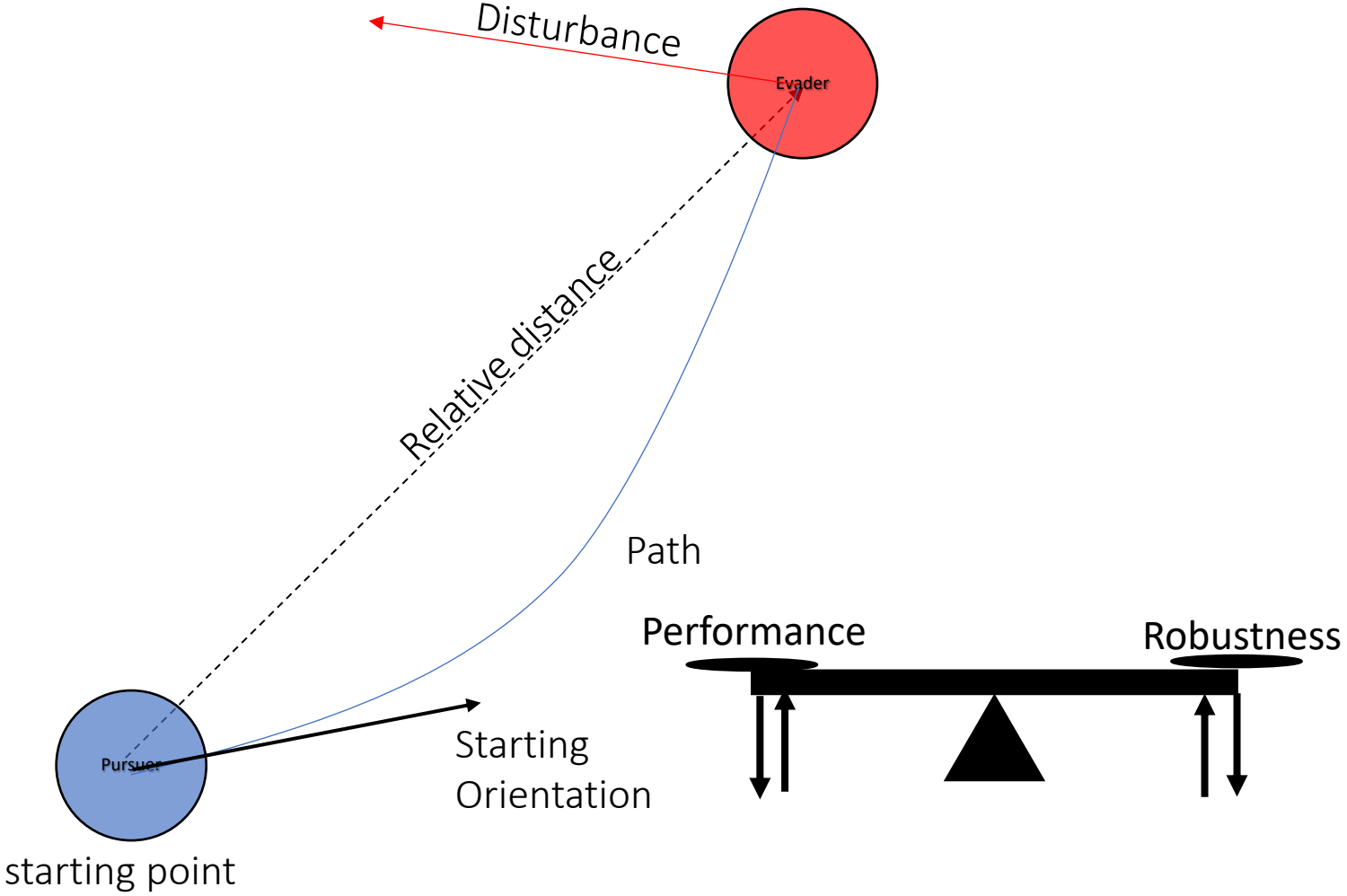




Principles of control can be applied to robotics

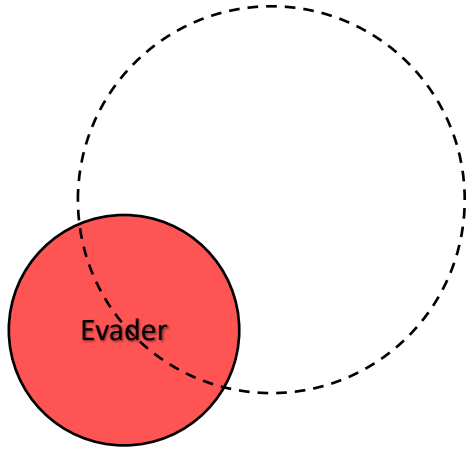


Desired robot motion is achieved using control systems

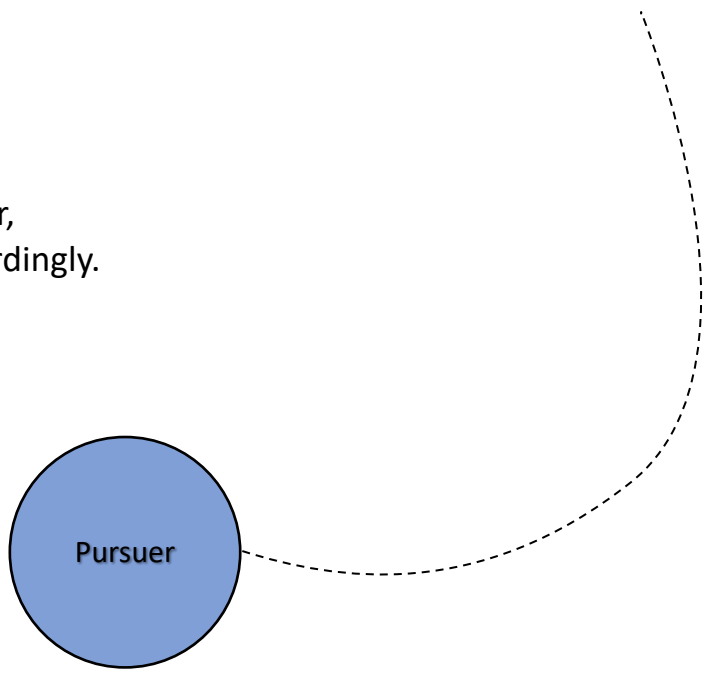


The pursuer and evader behaviors are enhanced

The evader uses agility to avoid
The pursuer.



Pursuer Follows the evader,
adjusting its position accordingly.



starting point

PID control is utilized to obtain desired outcomes

Proportional Control:

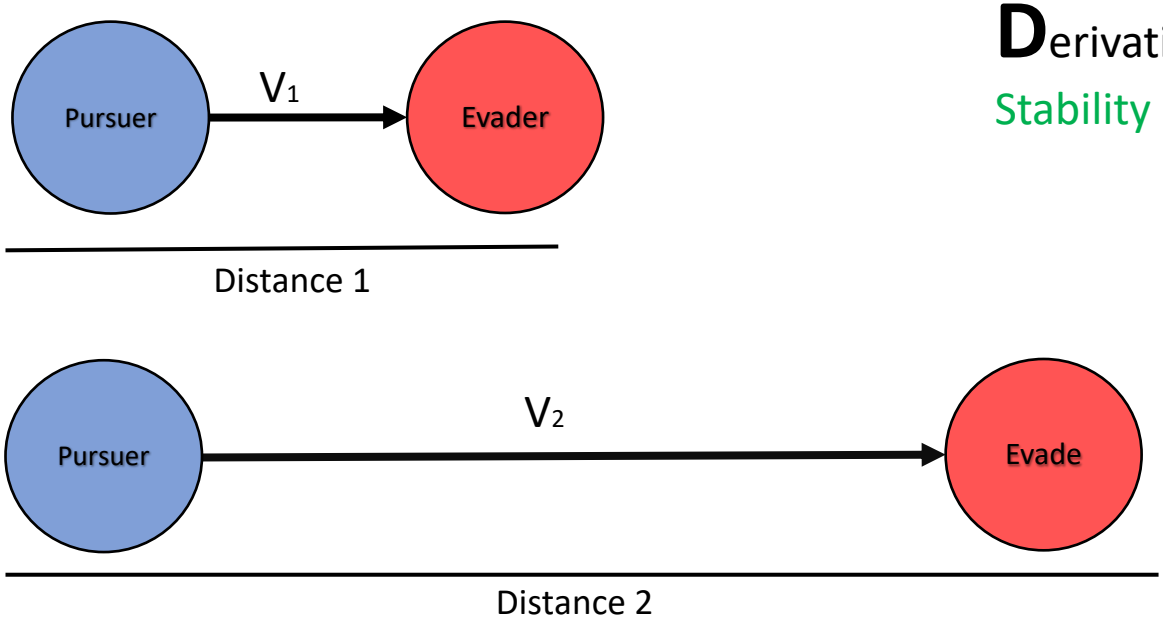
Main mode of control

Integral Control :

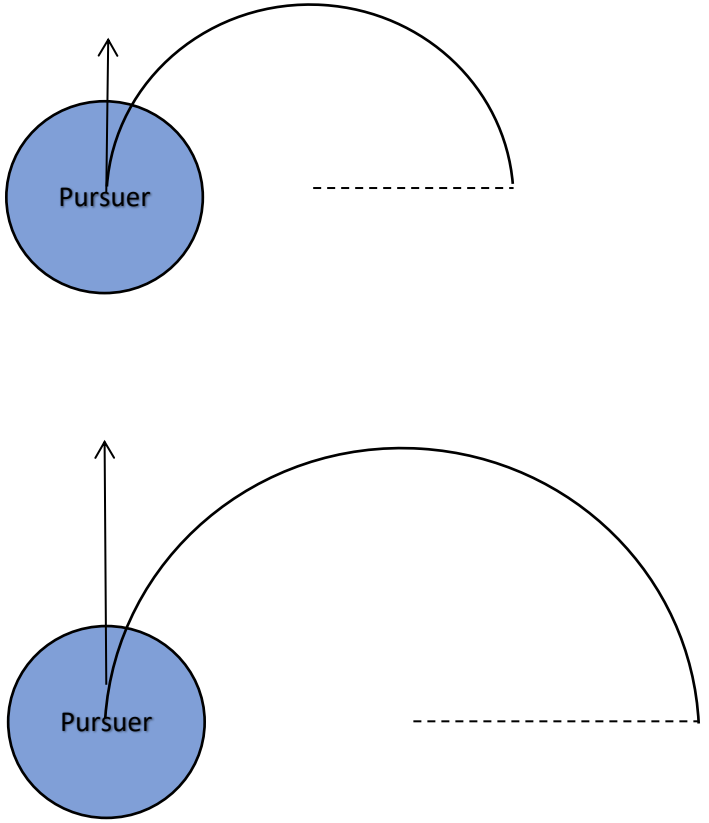
Performance

Derivative Control:

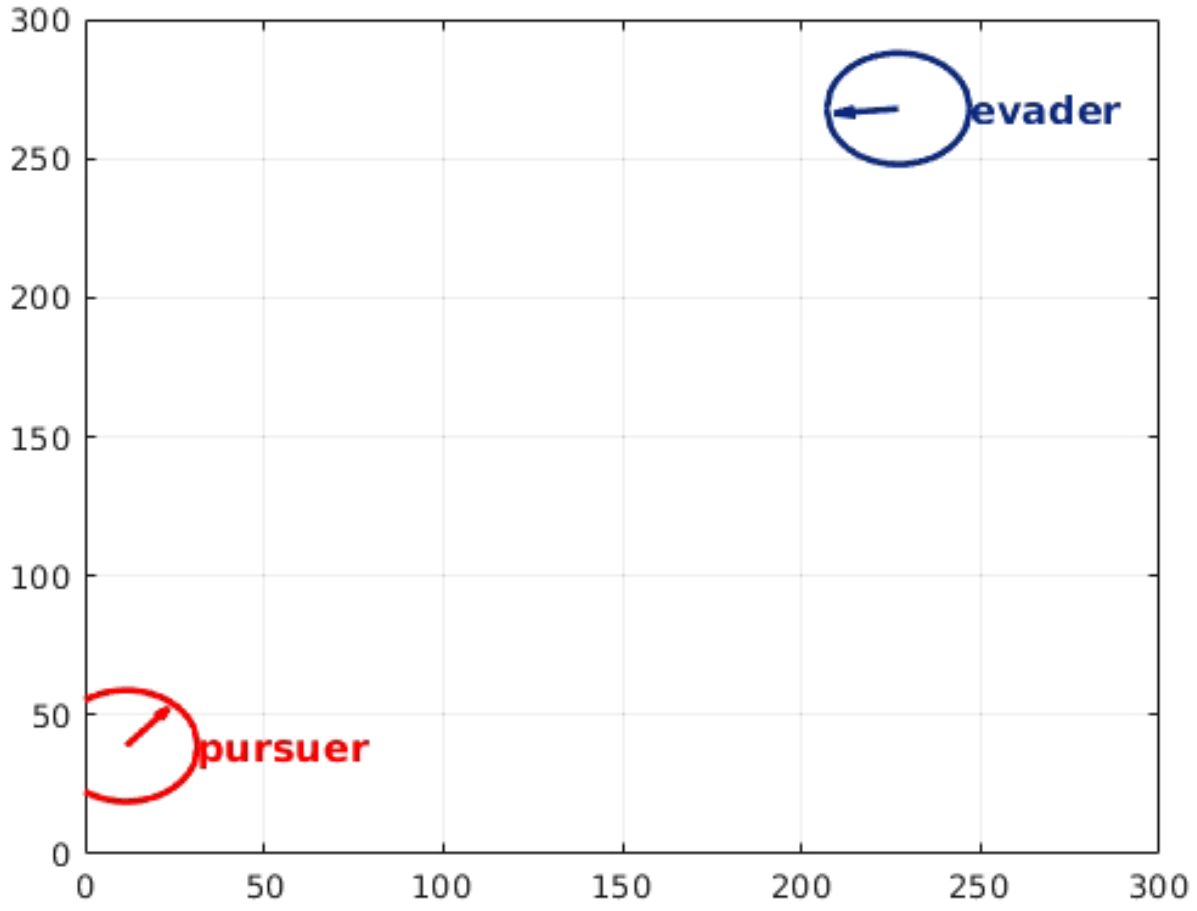
Stability



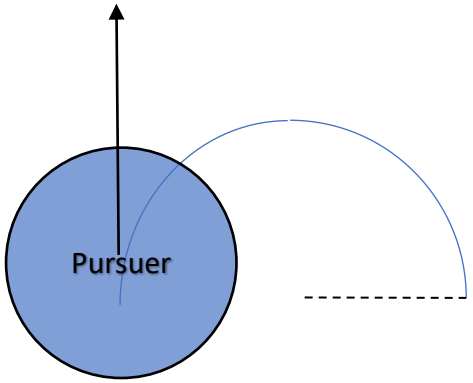
Efficient pursuit involves a combination of speed and agility



The resulting patterns of motion are monitored

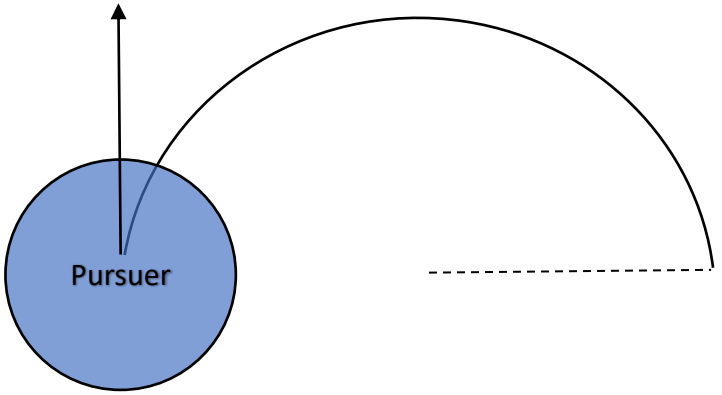


Success is maximized by increasing velocity and agility



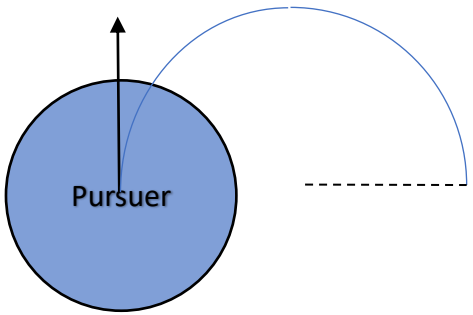
Pursuer success: 80%

High velocity and low turning radius



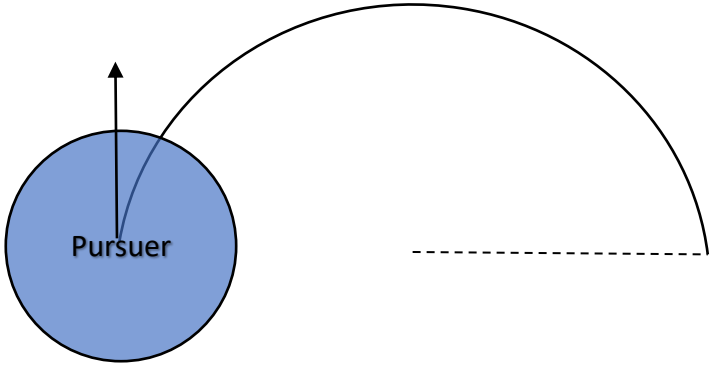
Pursuer success: 50%

High velocity and high turning radius



Pursuer success: 66.6%

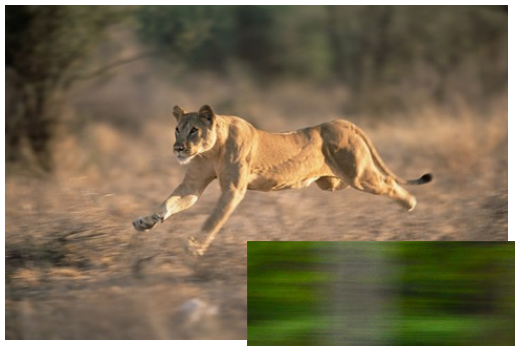
Low velocity and low turning Radius



Pursuer success: 33.3%

Low velocity and high turning radius

Successful control balances aggression and robustness



Aggression

Robustness

Successful Control

Acknowledgements

UCSB

SIMS

CSEP

Thank You!

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