Implementation of Control Systems to Sustain Autonomous Robot Motion

Tony Choi
Mariana Sanchez
Edgar Gonzalez
Vedad Bassari

Mentor: Sharad Shankar
PI: Dr. Joao Pedro Hespanha
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.
PID control is utilized to obtain desired outcomes

Proportional Control: Main mode of control

Integral Control: Performance

Derivative Control: Stability

Pursuer \( V_1 \) Evader

Distance 1

Pursuer \( V_2 \) Evade

Distance 2
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: 66.6%**
  - Low velocity and low turning radius

- **Pursuer success: 50%**
  - High velocity and high turning radius

- **Pursuer success: 33.3%**
  - Low velocity and high turning radius
Successful control balances aggression and robustness
Acknowledgements

Thank You!

Mentor: Sharad Shankar
PI: Joao Pedro Hespanha