Video Script

Thursday, July 26, 2018 4:58 PM

2-3 minutes total (120-180 seconds)

- Title screen (5 seconds)
  - Project name
  - School logo
  - Program name and class year
  - Group members names
- Project goal (5 seconds)
  - Text on screen "Build a robot that can beat humans at air hockey"
  - Video of two people playing air hockey
- 1 - Locating the puck (5 seconds)
  - Screen capture of puck tracker highlighting puck in red
  - Text on screen "Computer vision used to locate the puck on the air hockey table"
- 2 - Calculating the puck trajectory (10 seconds)
  - Video of puck tracker showing the puck moving on the table and drawing its trajectory
  - Text on screen "Consecutive position measurements used to calculate puck velocity and trajectory including bounces"
- 3 - Moving left/right (5 seconds)
  - Show robot paddle moving left/right
  - Text on screen "Custom robot developed to move an air hockey paddle at high speeds"
- 4 - X-Axis mechanism (10 seconds)
  - Close up of motor, encoder and pulley moving back and forth
  - (5 seconds) Text on screen "High power DC motor drives a timing belt to move the paddle on linear rails"
    - Highlight the motor and pulley
  - (5 seconds) Text on screen "Quadrature encoder enables precise position tracking"
- 5 - Moving forward/backward (5 seconds)
  - Show robot paddle moving forward/backward
  - Text on screen "Robot moves in two dimensions to cover playing surface"
- 6 - Y-Axis mechanism (10 seconds)
  - Split screen shot showing both left & right motors moving at the same time
  - (5 seconds) Text on screen "High power DC motors drive a timing belt on either side of the table to move the paddle on linear rails"
  - Split screen shot showing the X-Axis carriages left & right moving back and forth on the linear rails
  - (5 seconds) Text on screen "High power DC motors drive a timing belt on either side of the table to move the paddle on linear rails"
- 7.0 - CAD for mechanical design (5 seconds)
  - Shots of paddle being moved in Solidworks
  - Text on screen "3D mechanical model developed in Solidworks"
- 7.5 - Custom 3D printed hardware (5 seconds)
  - Shots of various mounting brackets, paddle, etc.
  - Text on screen "3D printing used to rapidly prototype mechanical components"
- 8 - Custom electrical hardware (10 seconds)
  - Screen capture of schematics and layout in Altium
  - Text on screen "Custom designed circuit board build to drive high power motors and interface with sensors"

    - Still image of paddle controller circuit board
- 9 - Safety features (10 seconds)
    - (5 seconds) Shot of robot shutting down with light screen being broken (close up of sensor looking at LED?)
        - Text on screen "Custom designed infrared break-beam sensors disable the motors if humans get too close"
    - (3 seconds) Close-up shot of limit switch being pressed and motors stopping
        - Text on screen "Limit switches disable the motors if they reach the end of travel"
    - (3 seconds) Shot of e-stop being pressed and motors stopping
        - Text on screen "Emergency stop provides a last line of defense to disable the robot"
- 10 - Homing routine (5 seconds)
    - (3 seconds) Shot of homing routine from above
    - (2 seconds) Shot of home position switch on X-Axis
    - Text on screen "Robot can perform a homing routing if it loses track of its position"
- 11 - Playing defense (10 seconds)
    - (5 seconds) Shot of robot playing defense
        - Text on screen "Robot can play defense to stop the human from scoring"
    - (5 seconds) Screen capture of puck tracker drawing the trajectory and expected position on screen
        - Text on screen "Trajectory of the puck is used to determine where to move the paddle"
- 12 - Playing offense (20 seconds)
    - (5 seconds) Shot of robot playing offense
        - Text on screen "Robot can play offense to try and score goals on the human"
    - (5 seconds) Screen capture of visualization showing paddle commanded position
        - Text on screen "Robot can quickly intercept the fast-moving puck"
    - (5 seconds) Goal light and sirens when robot scores a goal
        - Text on screen "The robot knows how to celebrate"
    - (5 seconds) Robot scores a goal and chirps the human player
        - Text on screen "The robot is highly competitive"
- 13 - UI (20 seconds)
- 14 - Future directions for project (5 seconds)
    - Video of people playing pool at a bar or air hockey at an arcade (5 seconds)
        - Text on screen "Air hockey robot could be a popular attraction in arcades or bars"
- 15 - Closing slide (5 seconds)
    - Conestoga college logo?