



CSCI 1106

Lecture 18

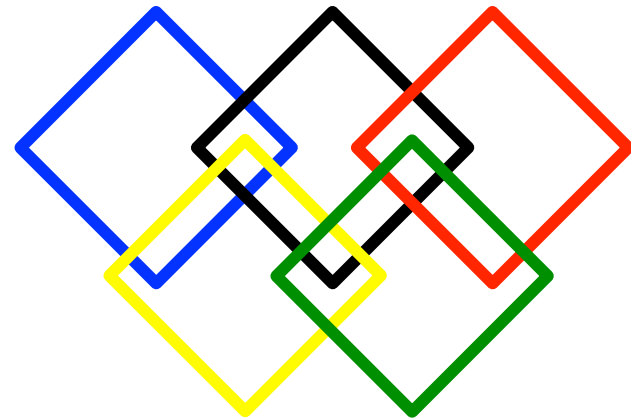
Project Planning

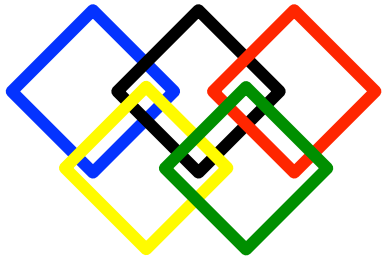
Announcements

- Quiz #5 is on Friday, November 15, in class
 - Including this lecture
- Today's Topics
 - The Project: Robot Olympics
 - Program Planning
 - Strategy
 - Tactics

Robot Olympics

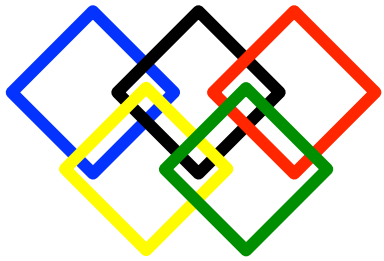
- Consists of 3 events:
 - Marathon
 - Hurdles
 - Curling
- Your Group's Tasks:
 - Write a program for each event
 - Compete in the Robot Olympics
 - Write a report on your project





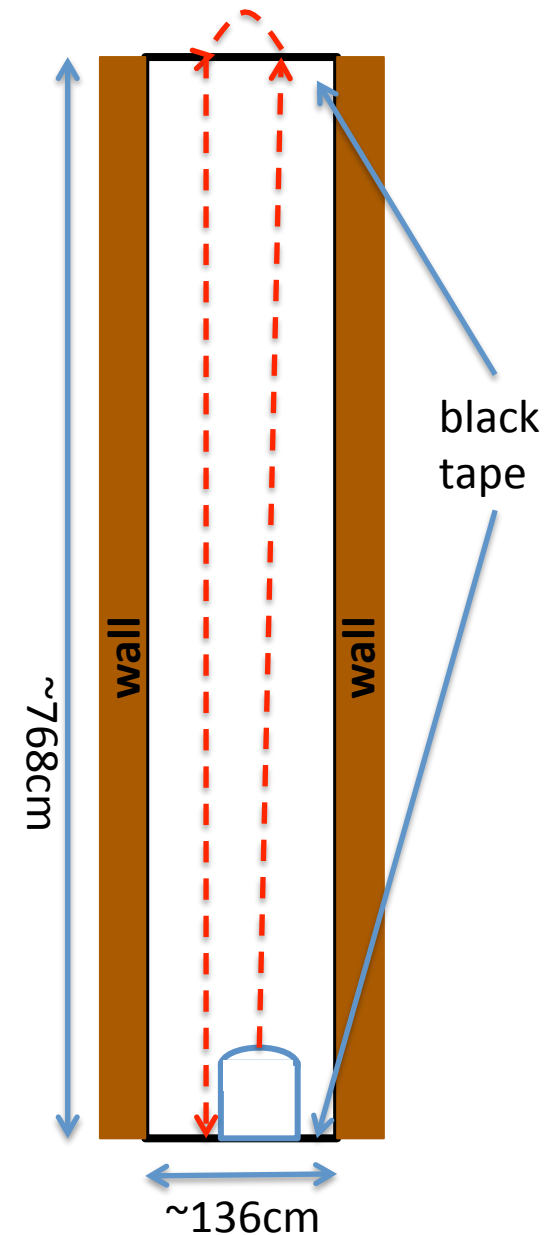
General Rules

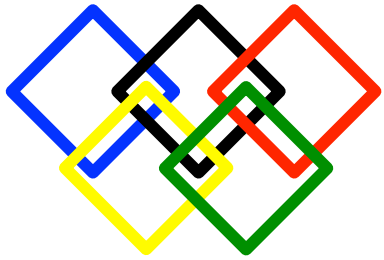
- One program per event
 - Programs cannot be changed once competition begins
- No human interference
 - You may not touch a robot while it is competing
 - Robots may be disqualified if interference occurs
- Robot's performance affects your grades
 - See project specifications for rubric



Marathon

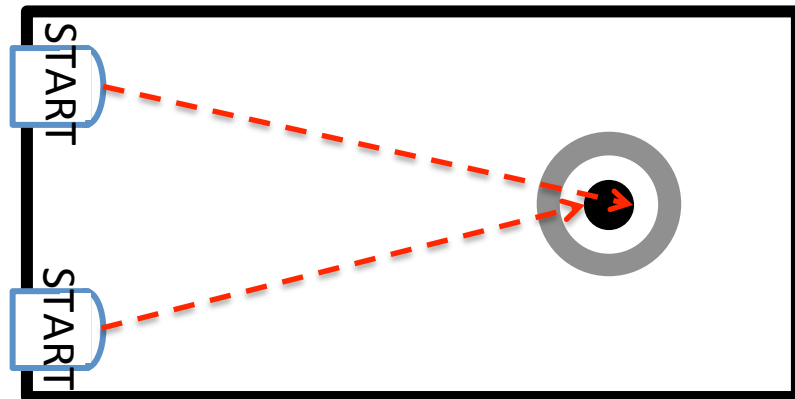
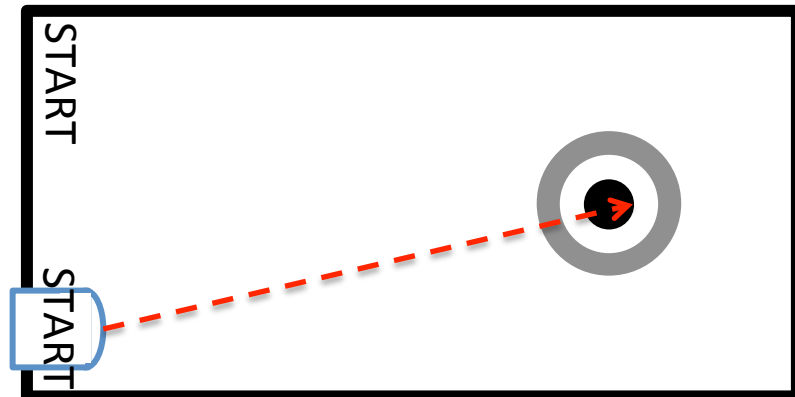
- As quickly as possible
 - Race down the corridor
 - Cross the line
 - Race back
 - Cross the Finish/Start line
- Robot has one 3-minute attempt

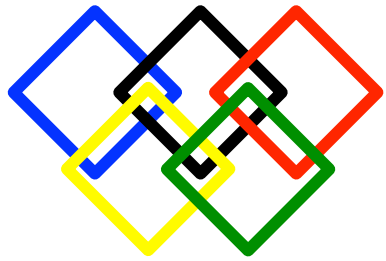




Curling

- Qualifier #1
 - Robot must stop moving after 1 minute
 - Robot may not leave the arena
- Qualifier #2
 - Robot must end up within the outer ring within 60 seconds
 - Robot must be able to start from either START position
- Competition
 - Head-to-head double elimination
 - Robot closest to the center of the ring after 60 seconds wins
 - Starting position determined by coin toss





The Project Report

General Information

- Report is aimed at peers, TAs, & instructor
- 8 pages, 11pt (see template)
- The report must
 - Provide sufficient background
 - Describe the program design, strategy, and tactics
 - **Justify your design decisions**
 - Describe how successful the programs were
 - State overall conclusions
- Rubric in project specification

Recommended Structure

- Title and author information
- Abstract
- Introduction
- Background
- Main Body
 - Marathon
 - Hurdles
 - Curling
- Results
- Conclusions and Future Work
- References

Where Do We Start???

- Situation:
 - 5 Labs (+ overtime if need be)
 - 3 Programs
 - 1 Project Report
 - 3 to 4 group members
 - 1 Robot
- Step 1: Identify the Tasks
 - Develop three programs
 - Write a project report

Steps for Developing a Program

1. Develop program *strategy*
2. Identify *tactics* to implement the strategy
3. Model tactics with state transition diagrams
4. Implement program based on STDs
5. Test your program
6. Refine strategy and tactics as necessary
7. Repeat

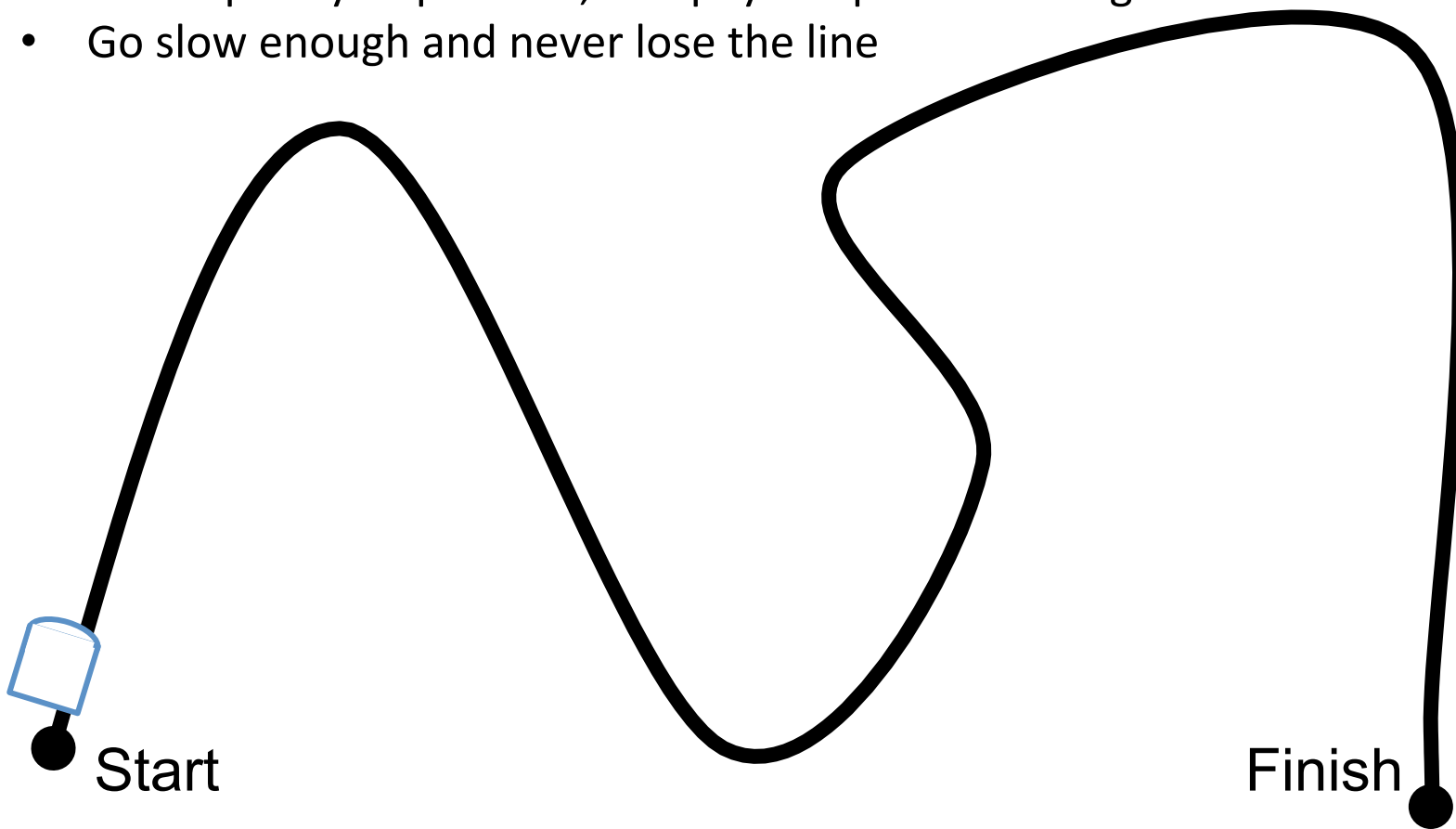
Strategy

- How are we going to solve the problem?
 - Typically there is more than one way
 - Can be described in a couple sentences
- Example: Getting to class on time
 - Avoid the rush hour
 - Don't drive
 - Live in residence
- Example: Preparing for exams
 - Study in advance
 - Cram the night before

Example: The Line Race

Strategies

- Go as quickly as possible, and pay the price of losing the line
- Go slow enough and never lose the line



Strategy (cont.)

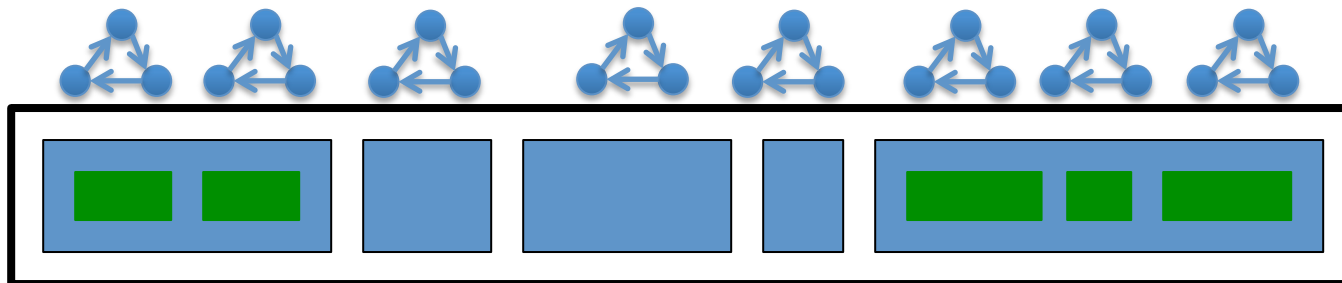
- Should be able to describe the strategy in a couple of sentences
- Use one strategy per problem
- A strategy is implemented with *tactics*
 - Tasks
 - Ideas
 - Concepts
- Each part of the strategy must be implemented with one or more tactics

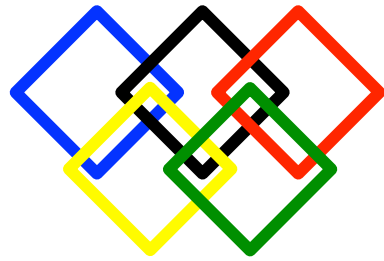
Tactics

- Tactics are how you implement the strategy
- Example: Cramming
 - Consume lots of sugar and caffeine
 - Play loud music
 - Tie yourself to your desk
- Example: Following the line at full speed
 - Implement a good recovery mechanism
 - Make sure your tires have good traction
- Tactics may be composed of multiple simpler tactics
- How do you put it all together?

Program Planning

- For each event formulate a strategy
 - Convince yourself that you can implement it
 - Identify the tactics you will need
- For each tactic
 - Design a state transition diagram
 - Design corresponding part of the program
- Put the parts together
- How much time will this take?





Project Management

- Determine amount of time to spend on each task:
 - Marathon
 - Hurdles
 - Curling
 - Project Report
- Note: former three can be done sequentially, the latter in parallel
- Divide up time among tasks: (example)
 - Marathon (1 lab period)
 - Hurdles (2 lab periods)
 - Curling (2 lab periods)
 - Project report (homework)
- Notes:
 - Be prepared to adjust your time estimates as the project evolves
 - Group communication and management is very important!