

Team2228 Robot Needs Design Process

Objectives:

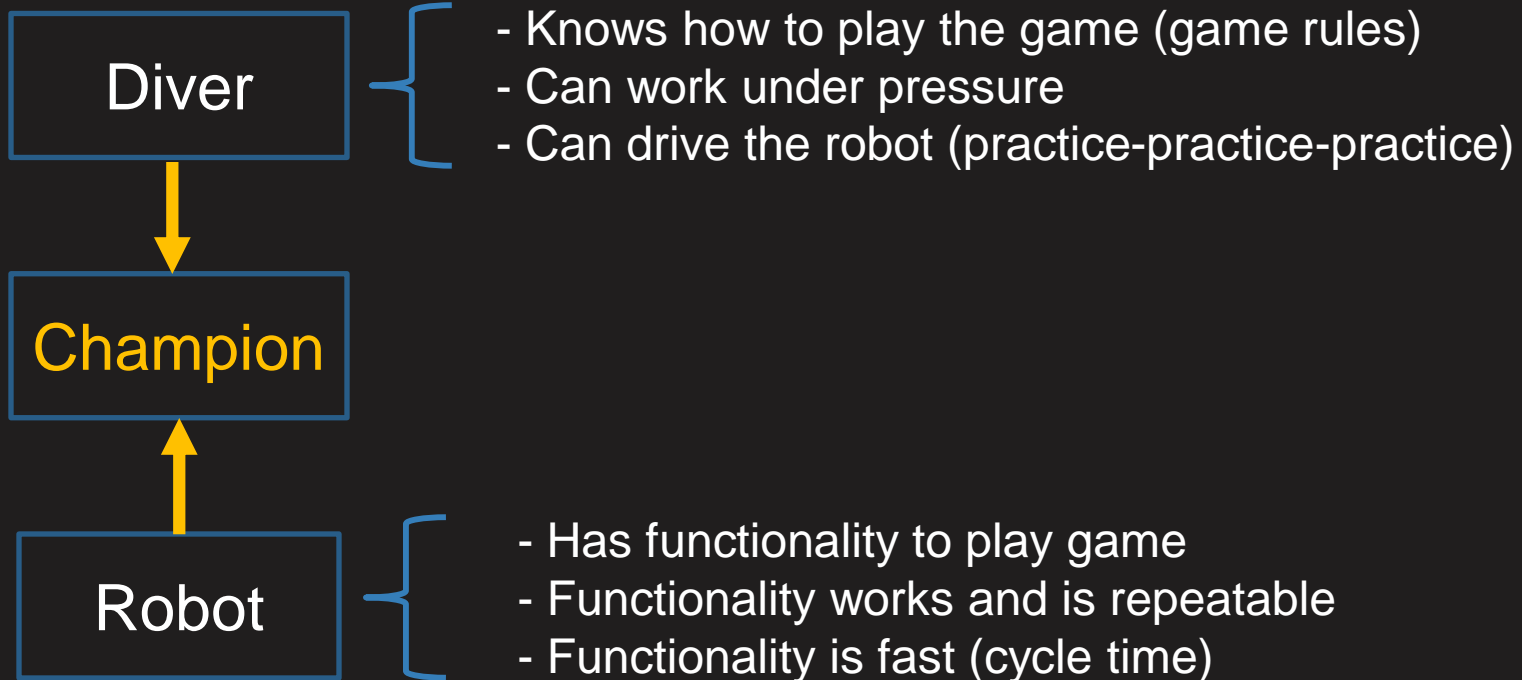
- To understand the two stages of the robot concept design process
- To understand the process to determine what the robot has to do to play the game
- To understand the questions to ask in each stage to be successful

Competition Team Selection Process

- Each team plays in an alliance of three teams 9-10 times
- Highest 8 ranked teams are the captains for the finals
- 24 teams in the finals – (3x8)



Champion Robot Characteristics



Team2228 Robot Concept Design Process

There are two stages of the robot concept design process:

- Phase 1: How to play the game and what the robot has to do
(Needs Analysis – Team developed)
- Phase 2: Develop a robot system to satisfy the needs of the game
(Concept – Technical sub-team developed)

Team2228 Organization on Kickoff

Team 2228 will divide into two (2) teams:



- There should be a mix of technical and operations team members
- Mentors will be assigned to sub-teams

Team2228 Robot Needs Design Process

- 1 READ the game rules!!!!!! / Robot rules
- 2 Understand the scoring: game points / ranking points
- 3 Develop a strategy on how to play the game
- 4 Define what the Robot has to do to execute the strategy

1st Question: What is the Goal?

FOR FIRST COMPETITION:

“OBTAIN THE HIGHEST SCORE/RANKING SCORE IN A MATCH”

READ THE GAME MANUAL

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graph TD; A[READ THE GAME MANUAL] --> B[WHAT ARE ALL THE SCORING SCENARIOS???  
(List all of them)]; B --> C[HOW CAN OUR ALLIANCE PREVENT THE OTHER ALLIANCE FROM SCORING POINTS???]
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WHAT ARE ALL THE SCORING SCENARIOS???
(List all of them)

HOW CAN OUR ALLIANCE PREVENT THE OTHER ALLIANCE FROM SCORING POINTS???

THIS IS COMPLETED BY EACH SUB-TEAM – WRITE THE RESULTS IN YOUR ENGINEERING NOTEBOOKS

2nd Question:

What does the Robot have to do to play the game?

FOR EACH SCORING SCENARIO –
WHAT ACTIONS DOES THE ROBOT
HAVE TO DO???

FOR EACH SCORING SCENARIO

STEP	ACTION	ACTION TIME

WHAT SCENARIO HAS THE FASTEST TIME???

ARE ALL ACTIONS LEGAL??

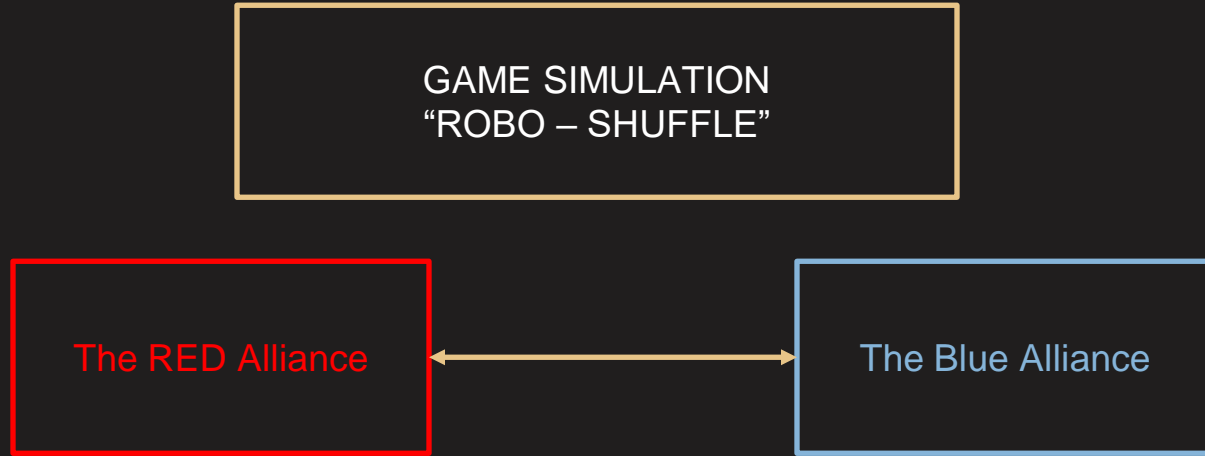
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Scenario Development Guideline

- Make a movement plan (e.g. like a football diagram).
 - What are the shortest routes the robot can take?
 - How long does it take to travel routes?
- For robot actions - act like a robot
- Estimate action times from your movements
- CYCLE TIME WINS THE GAME – What is your best scenario?
- RECORD: Write everything down in your engineering notebooks

3rd Question:

How do you test your best scenario?

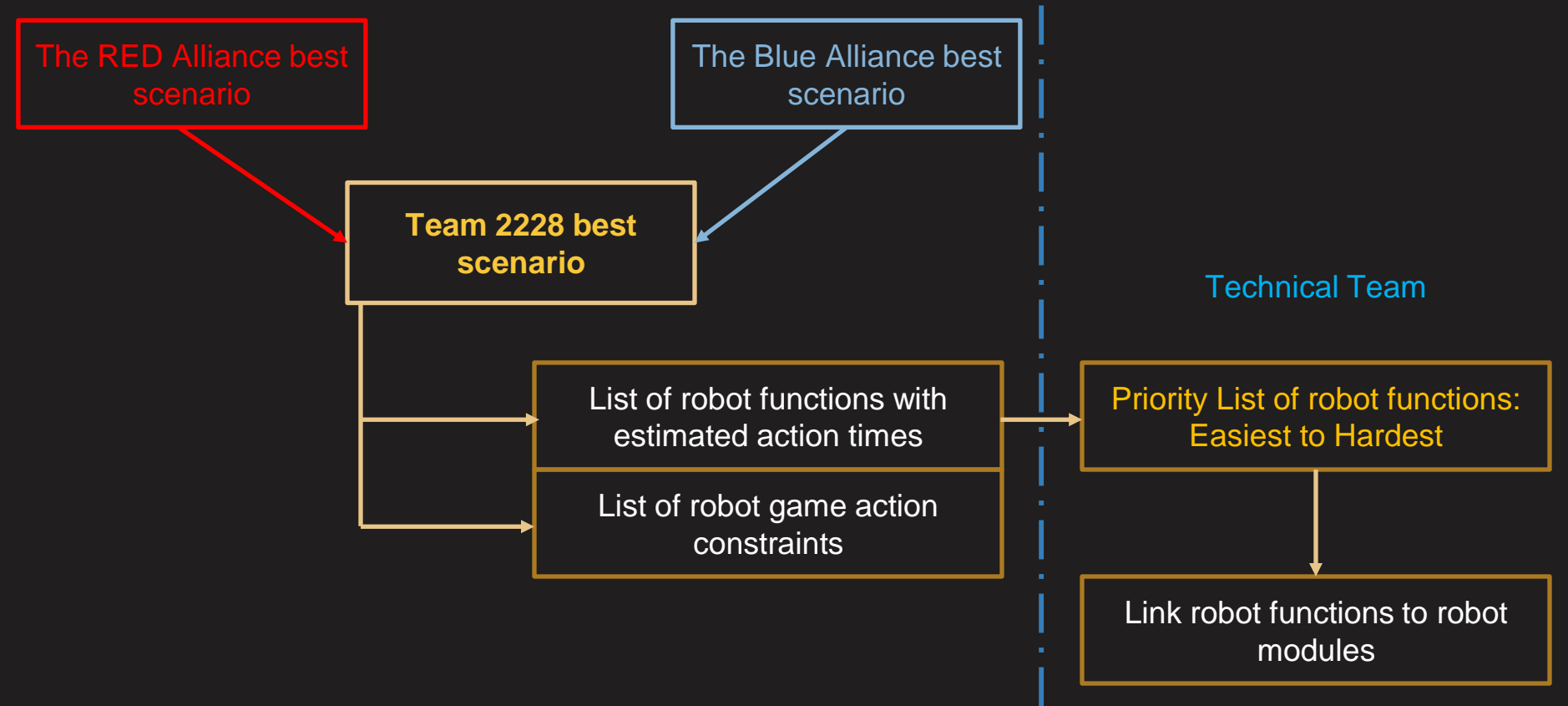


- Execute a event match under match time constraints
- Each robot driver will perform the robot actions guided by a sub-team coach
- RECORD: What was good- What was bad

Team2228 Final Team Strategy Process

- 1 Each alliance team reports their alliance the following:
 - a. Their scoring capability
 - b. Their game strategy / cycle time
 - c. Their list of Robot functions
- 2 Each alliance will develop one strategy and robot function
- 3 Alliance strategies and robot functions are combined into a team strategy and **prioritized** robot functional complexity

4th Question: As Team2228: What is the best scenario?



Team Exercise

Watch a previous year animation

- Do a scoring analysis
- Develop robot strategy to play game
- Define robot functions necessary to play game