

# Strategy / Game Analysis

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# Por que?

We design the robot to play the game not just because robots are cool which is also a valid reason.

We have to decide **WHAT** the robot has to do before we discuss **HOW** we are going to do.

# Como?

**Scoring** - How can we gain points?

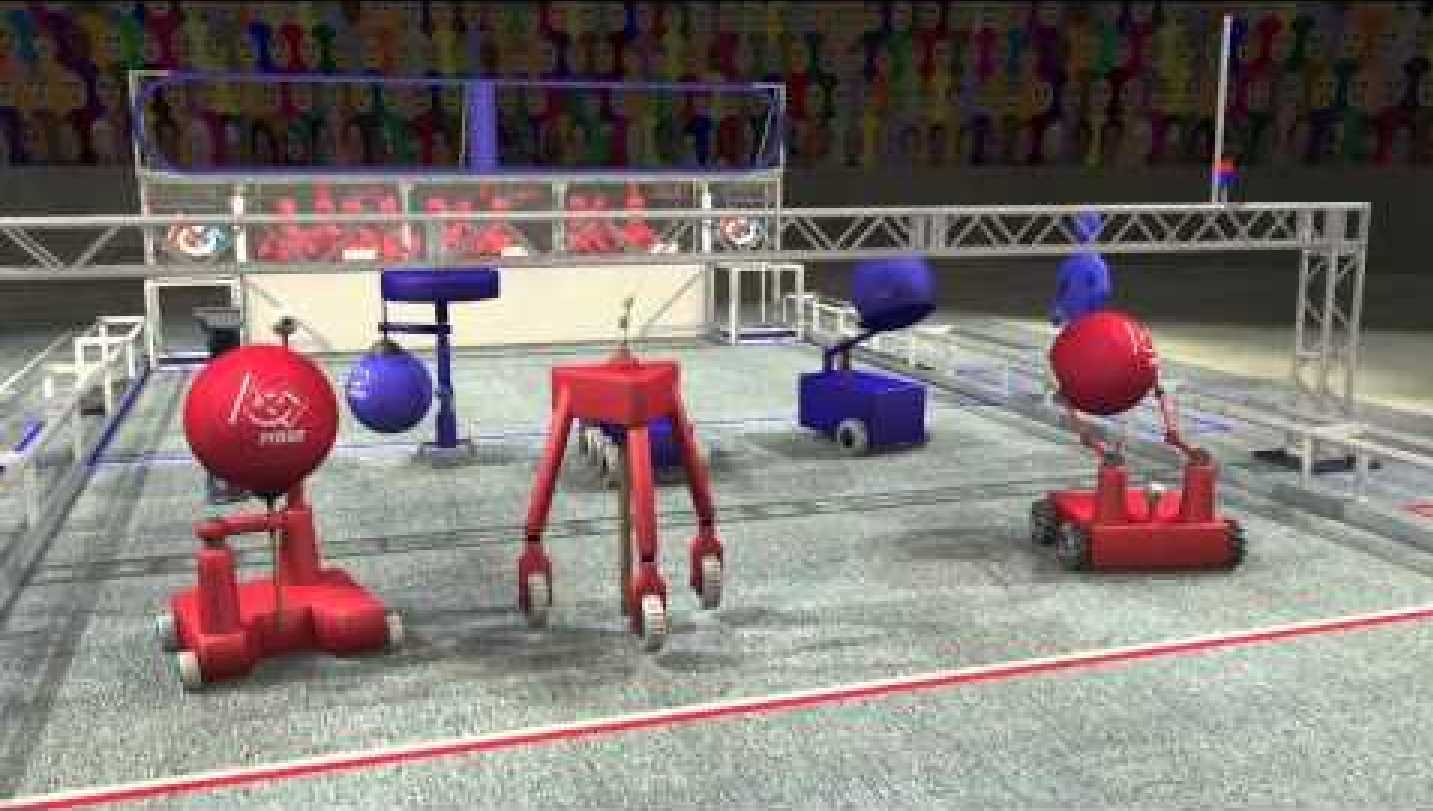
**De-scoring** - How can we lose points?

**Tasks** - What can we do to score?

**Defense** - What can we do prevent the other alliance from scoring?

**Alliance** - What can each robot on our alliance be doing?

**Prioritizing** - What is most important? What do we want our robot to do?



# Example: Aerial Assist 2014

<https://www.youtube.com/watch?v=f5zWzICG5to>

# Scoring - How can we gain points?

- Low goal +1pt
- High point +10pt
- Autonomous
  - goal +5pt
  - hot +10pt
  - autozone +5pt
- Assists
  - 2 +10pt
  - 3 +30pt
- Truss +10pt
- Truss & catch +30pt

Action	Base	AUTO (=Base+5)	AUTO & HOT (=Base+AUTO+5)	1 ASSIST (=Base+0)	2 ASSIST (=Base+10)	3 ASSIST (=Base+30)
LOW GOAL	1	6	11	1	11	31
HIGH GOAL	10	15	20	10	20	40
TRUSS	10					
Mobility		5				
CATCH	10					

# De-Scoring - How can we lose points?

FOUL -20 pt unintentional    TECHNICAL FOUL -50pt intentional

An ALLIANCE may not pin an opponent ROBOT for more than five (5) seconds. A ROBOT will be considered pinned until the ROBOTS have separated by at least six (6) ft. The pinning ROBOT(S) must then wait for at least three (3) seconds before attempting to pin the same ROBOT again. Pinning is transitive through other objects.

An ALLIANCE may not POSSESS their opponent's BALLS. The following criteria define POSSESSION : A. "carrying" (moving while supporting BALLS in or on the ROBOT or holding the BALL in or on the ROBOT), B. "herding" (repeated pushing or bumping), C. "launching" (impelling BALLS to a desired location or direction via a MECHANISM in motion relative to the ROBOT), or D. "trapping" (overt isolation or holding one or more BALLS against a FIELD element or ROBOT in an attempt to shield them).

# Tasks - What can we do to score?

- Shooting
  - High goal
    - Line up to low goal to shoot consistently
  - Over truss
  - To human player
- Receive the ball
  - From floor
  - From human player
  - From another robot
- Roll into low goal
- Passing to another robot
  - roll on ground
  - throw over defenders

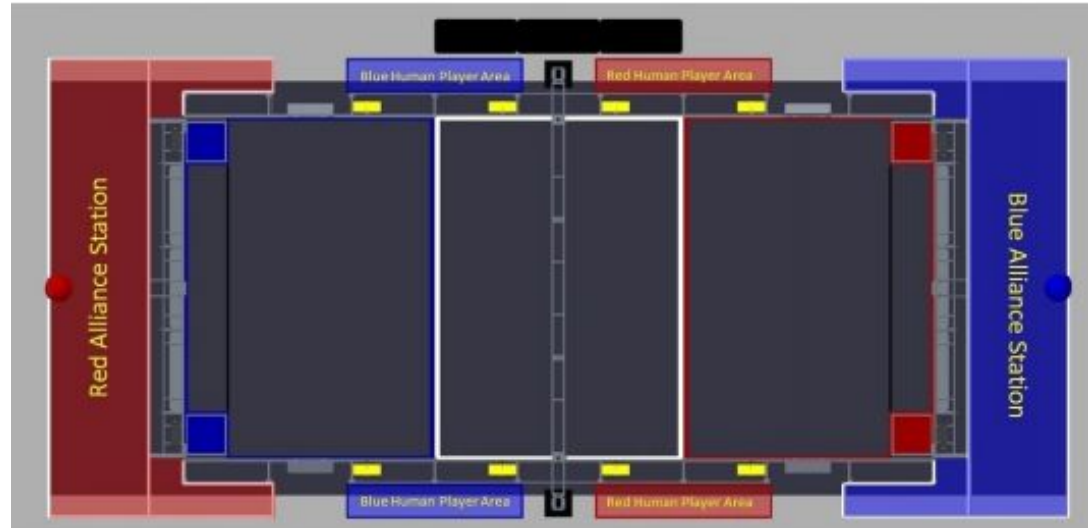
# Defense - What can we do prevent the other alliance from scoring?

- Low goal
  - block openings
  - pin
- High goal
  - paddle
  - arm
- Assisting
  - shove other team's robot



# Alliance - What can each robot on our alliance be doing?

- Robot 1
  - Through into high or low goal
  - Catch from robot 2/human player
- Robot 2
  - Throw over truss
  - Acquire ball from robot 3
  - Roll/carry under truss
  - Pass to robot 1 or human player
- Robot 3
  - Ball from human player
  - Defense
  - Pass to robot 2



# Prioritizing- What is most important? What do we want our robot to do?

- Worst case scenario: two robots on alliance don't work at all
  - We have a high goal shooter
  - Max. score = 10 pt (high goal) + 10pt (truss) = 20
  - we have a low goal shooter
  - Max. score = 1pt (low goal) = 1
- Best case scenario: two robots on alliance assist
  - No high goal shooter
  - max score = 3 assists (30 pt) + low goal (1pt) = 31
  - High goal shooter
  - max score = 3 assists (30 pt) + truss (10pt) + high goal (10 pt) = 50

# Conclusions + Decisions

Highest scores require assists. Even if you shoot high, without assisting, you will still score 20 points lower than a 3 assist alliance with no high shooter at all. In addition, assist points are the second scoring consideration when ranking

Having no high shooter is risky. Without a high goal shooter, you are risking scoring very low (1pt per ball) if you are unlucky with your alliance. (Many NY robots don't move first day).

We decided to have a robot that assists and a shooter that can score high goals. So we need a shooter [high goal/truss] and acquirer [assisting].



# Let's Practice: Stronghold 2015

<https://www.youtube.com/watch?v=VqOKzoHJDjA>

# Cuando in discussion:

- Don't be afraid to share your wildest and craziest ideas, they may be useful.
- Don't use the word "like." Clearly describe what you have to say because we might not "get what you mean."
- Draw on the board to describe any ideas you have
  - we can't see the image in your head
  - explain what you are drawing as you are drawing so that everyone understands your drawing and your idea clearly
  - draw clearly, simply, and big
- Assert your idea with authority and confidence so that it can be heard in the conversation. Don't be afraid to share your ideas they are valuable.
- Keep spewing out ideas even if the squad seems to have come to a consensus because the idea might be better or valuable enough to modify our approach
- Write things down and take notes so things are not forgotten about.

- Keep an open mind.
- Don't become overly attached to any single idea - especially one of your own.
- Do not become defensive; do not blind yourself to logic and the arguments of others. Defend your opinions and your ideas but always focus on the ultimate goal of providing the best solution possible.
- Try to stay positive, even when pointing out negatives.
- Engineering is based in logic. Do not allow emotion to interfere with the process.
- Don't let feelings be hurt if someone disagrees with you, even if they give into emotion and are (overly) harsh.
- An unjustified opinion is a worthless one. Describe WHY you like or dislike something.
- This is NOT rhetoric, it is engineering. It is not the one who can speak the best but the one who can provide quantitative proof that will win an argument and prove their idea is better!

# Kickoff Day 1 - Saturday 10 am - 2 pm

- Watch [Stream](#) starts 10:30 am
- Watch game video again
- Read manual as a team
- Do game analysis
- Come up with multiple strategies

# Day 2 - Sunday 10 am - 4pm

- Review yesterday
  - Watch video again
  - Reiterate the analysis
  - Reiterate the strategies we came up with
- Add more if people came up with stuff at home
- Play out the strategies
- Discuss Pros and Cons of each
- Make a decision on Strategy
- Start design brainstorming