

Game Design Challenge Finalist Team 900

Team Name: The Zebracorns

Location: Durham, North Carolina USA

Game Name: Farming Frenzy

Game Overview:

Welcome to Farming Frenzy, presented by The ZebraCorns. In this game, two alliances of farmers collaborate to cultivate Robotics Ranch. A storm is brewing, and the farmers have only 2:30 to protect their produce. To do this, they must deliver their crops to 6 silos and 3 farmers' markets which are located in 9 plots. Robots may also score crops in mills. Teamwork will be key as the farmers work together to protect their harvest!

During the 20 second AUTONOMOUS PERIOD, ROBOTS follow pre-programmed instructions. Alliances score points by:

Beginning work early by crossing the INITIATION LINE

Scoring CROPS in SILOS and FARMERS' MARKETS

During the remaining 2:10, drivers take control of their ROBOTS. ALLIANCES continue to score points by:

Continuing to score CROPS in SILOS and FARMERS' MARKETS

CULTIVATING PLOTS

Passing CROPS through the MILLS

During the final 30 seconds, ALLIANCES may protect their SILOS by placing SLABS on top of the three SILOS within their three PLOTS.

PLOTS

An ALLIANCE receives four points for each MAJORITY they have in SILOS or FARMERS' MARKETS

An ALLIANCE receives two points for each MINORITY they have in SILOS or FARMERS' MARKETS

An ALLIANCE receives two points for each PLOT they are CULTIVATING

INSPECTION

Points scored from PLOTS, SILOS, and FARMERS' MARKETS are awarded every 10 seconds

The state of the FIELD between INSPECTIONS does not affect points awarded

MAJORITY

An ALLIANCE has a MAJORITY in a SILO or FARMERS' MARKET if they have more CROPS than the opposing ALLIANCE

The red ALLIANCE can not earn points from having a MAJORITY in a blue SILO, and vice versa

MINORITY

An ALLIANCE has a MINORITY in a SILO or FARMERS' MARKET if they have fewer CROPS than the opposing ALLIANCE but at least one CROP



If ALLIANCES have an equal number of CROPS, both ALLIANCES are considered to have a MINORITY CULTIVATION

If a PLOT has ROBOTS of one ALLIANCE with their BUMPERS fully contained within it, that ALLIANCE is CULTIVATING that PLOT

If ROBOTS from different ALLIANCES both have their BUMPERS fully contained within a PLOT, no ALLIANCE is CULTIVATING that PLOT

A ROBOT can only CULTIVATE a PLOT in which they have a MINORITY

PROCESSING

Each ALLIANCE may score in each MILL once

Red ROBOTS must shoot at a MILL with their BUMPERS breaking the plane of a blue PLOT and vice versa

When two or three ALLIANCE ROBOTS score in MILLS simultaneously, the point value of each MILL is doubled or tripled respectively

FORTIFICATION

During END GAME, ROBOTS may place SLABS on each of their three SILOS.

When two or three ALLIANCE ROBOTS score SLABS simultaneously, the point value of each SLAB is doubled or tripled respectively

RANKING POINTS

An ALLIANCE earns two RANKING POINTS for a win and one for a tie

An ALLIANCE gains an additional RANKING POINT for earning forty-five MILL points

An ALLIANCE gains an additional RANKING POINT for placing all three SLABS

Describe Notable Field Elements:

Each FIELD is a 26ft. by 54ft. carpeted arena, consisting of 9 PLOTS delineated by tape. Across the MIDLINE of the FIELD is a TRUSS. Hanging from the TRUSS are three FARMERS' MARKETS. Above the TRUSS are five MILLS.

CROPS - 10in. diameter compressible balls. There are 40 CROPS for each ALLIANCE, with 10 placed in the CROP BEDS, and the rest in a cache behind the ALLIANCE WALL, which enter the field through the FEEDING STATION.

PLOT - There are three red PLOTS and three blue PLOTS, each containing a SILO. There are also three neutral PLOTS, containing a FARMERS' MARKET. To place a CROP in its respective goal, a ROBOT'S BUMPER must be fully within, or break the vertical plane formed by the tape defining the PLOT.

SILO - Each of the three red and blue PLOTS has a corresponding SILO. These are 3ft. diameter cylindrical goals, with bars evenly spaced such that they can hold CROPS, but also such that a CROP may be squeezed between two bars.

FARMERS' MARKET - Each of the three neutral PLOTS has a corresponding FARMERS' MARKET. These are 3ft. Diameter cylindrical goals which hang from the TRUSS.



MILL - These are circular goals without a net, which can be scored on by throwing CROPS through them. There are 5 MILLS, which are located above the TRUSS. These use ArUco markers evenly spaced between the MILLS as vision targets.

SLAB - 38in. diameter disk that may be placed on top of SILOS to earn points in the ENDGAME. Two SLABS are available from the SLAB DEPOTS and one more via a slot in the ALLIANCE STATION WALL.

TRUSS - A TRUSS spans the MIDLINE of the FIELD with 8ft. clearance, from which FARMERS' MARKETS hang and above which MILLS are located.

What are robots expected to do?

Farming Frenzy is designed with three driving forces in mind: ensuring that there are multiple paths to victory and that no one way is unbeatable, encouraging ALLIANCES to collaborate, and enabling ALLIANCE members of all skill levels to be able to contribute substantially to their ALLIANCES' performance in a match.

During the AUTONOMOUS PERIOD, ALLIANCES will rush to secure control of their SILOS and FARMERS' MARKETS before TELEOP starts. During TELEOP ALLIANCES continue obtaining CROPS from the FIELD or FEEDING STATIONS and delivering them to SILOS and FARMERS' MARKETS. CROPS may only be delivered to FARMERS' MARKETS via shooting, but, since the CROPS are compressible, ROBOTS may either shoot into the SILOS from above or squeeze the CROPS through the bars. However, even if an ALLIANCE is unable to contend in the FARMERS' MARKETS, they will have other methods of accruing points. For example, through good strategy and communication, ALLIANCES may trigger collaboration multipliers and potentially even RANKING POINTS by simultaneously scoring in the MILLS or placing SLABS during the END GAME.

Even if a ROBOT doesn't have the capabilities to place SLABS or score in FARMER'S MARKETS, they can still make a major impact on the outcome of a match. Our game allows ROBOTS of all ability levels to contribute through various actions that score points for their ALLIANCE, from placing SLABS to CULTIVATING PLOTS. Teams can also contribute by analyzing the FIELD to find the ideal strategy in order to maximize the points gained by their ALLIANCE. Even with good strategy, three great ROBOTS will not be able to form a great ALLIANCE unless they can work well together.

Did you use the Game Design Challenge Element in your concept?

Yes

If yes, how?

Of the nine PLOTS in our game, three are neutral, and correspond to three FARMERS' MARKETS that hang from a truss, via chains. These provide an added challenge compared to the SILOS in the blue and red PLOTS. While balls can be placed into SILOS, these FARMERS' MARKETS can only be scored on by shooting. Furthermore, the shot angle, swing factor, and the truss in the way of your shot, all add subtle and unique challenges to scoring in the markets, all while maneuvering around robots from the opposing alliance in a fight for position. Chains are also used in the FARMERS' MARKETS as a method to prevent the CROPS from falling out. On every corner, there are 4 chains.