Linn-Mar Robotics

Issue 2, 2025

February Newsletter

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Contact Info/ Interesting Websites

- ***FIRST* Website**: http://www.firstinspires.org
- **Linn-Mar Website**: http://linnmar.k12.ia.us
- **Dan Niemitalo**: Head Coach
- **Contact the organization:** lmhsrobotics@gmail.com
- **Linn-Mar Robotics Website** lmrobotics.org

REEFSCAPE

This year, the FRC game announced was **REEFSCAPE presented by HAAS**. Unlike last year, REEFSCAPE will be a placement game. This means one of the two game pieces will need to be placed in specified places to earn points. The game pieces are a cylindrical tube called coral and a rubber ball, 16in in diameter, called algae. The coral will is place on a pole at varying heights and with varying orientations called the reef. The algae will be score either in a processor, on ground level, or in the net, 8 feet high. The field this year is approximately 26ft by 57ft and will be spilt in two with one alliance on each side. The sides are dived by the net with hanging cages the robots climb during end game.

FTC State

FTC State Championship! This month, February 28th, teams 4234, Lost in Time, and 4150, Dark Matter, will be going to Coralville to compete for their shot at becoming this years Iowa state FTC champions. If the teams win either one of the two inspirit awards or win as one of the top two alliances they will get themselves an invitation to FTC Worlds. Wish the teams luck!

Up Coming Events!

What's next at Linn-Mar robotics? After both team 4234, Lost in Time, and team 4150, Dark Matter, won their league championships they will be going to state in February! The FTC teams will be heading to Coralville to compete for state championship, starting on March 1st and ending on March 12th. As for team 967, they have just started their new season. They have plans to got to Cedar Falls, on February 22, for a scrimmage before their official regionals. For their regionals, they are going to Saint Louis and Cedar Falls for the Twin cities regional and Iowa regional respectively. Wish our teams luck!

967 Iron Lions

New Season! New Plans!

The 967 Iron Lions team has officially started their build season! After their kick-off in early January, the team has been hard at work designing and coding prototypes, strategizing in team meetings, and building field elements. Team 967 had many meetings discussing plans and potential designs with a focus on potential points and design cost. In essence, how many points could we get, and how difficult is it to make. These talks led the team to pick a robot that could maximize points; this, of course, made it very complex as well. But the Iron Lions are confident in their abilities and skills when it comes to building an amazing robot. With an experienced and well-trained team, this year could be 967's year.

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Outreach and Awards

The start of a new season means a lot of work for the awards and outreach sub-teams. They have been hard at work preparing their presentation and video for the FIRST impact award. The outreach sub-team has been very productive during the off-season making an impact in out local community. They met with sponsors, attended events to show the teams support, and helped teach local youth about robotics. Now with the season starting, the sub-team is working hard to prepare to show the judges just how big an impact the Iron Lions can make. With a presentation, amazing video, and criminal charisma they cannot be beaten.

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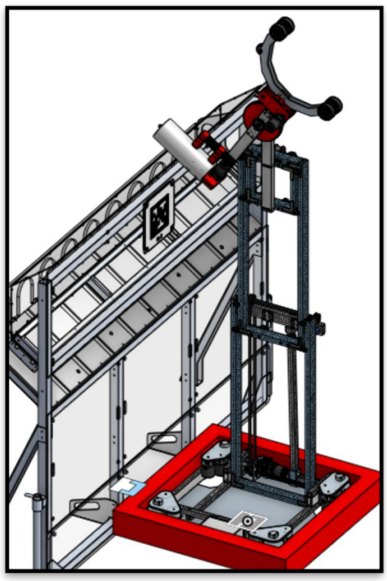
CAD, CAD, and more CAD



CAD is the foundation the rest of robotics is built on. Without CAD you have no design to follow when building a robot; and with no robot, you have nothing to code. CAD is a corner stone of robotics, and it is especially important during the start of a new season.

Robot ideas are abundant at the beginning of a new season. To better highlight their advantages and disadvantages, each of those concepts is given a CAD model. The quantity and caliber of CAD designs have significantly increased this year following the off-season CAD training that new members received. Both new and seasoned team members invested time in brainstorming and creating possible concepts for the group to review. The team was able to better visualize components and test ideas in CAD simulations, which improved planning.

CAD is not solely important during the beginning of the season. During build season, teams use CAD to design and print parts for their robots, test potential ideas, and provide instructions for their assembly teams. For 967, the CAD sub-teams are busy designing and testing the robots climbers and printing parts for the robots elevators. At the same time, the assembly sub-teams are working on the robot's drive base and elevator. The sub-team divide helps the team utilize their time better. This time management has helped the

Up Coming Events for The Iron Lions

The Iron Lions have many up coming events after the start of their new season. On February 22. They will be attending The Corn Dog Classic, a scrimmage hosted by team 525, in Cedar Falls IA. After that, on February 28th, they have their first official regional in Cedar Falls Iowa, the Iowa regional. They will end their planned schedule with their final regional in Saint Louis, the Twin Cities regional, starting on March 15th.

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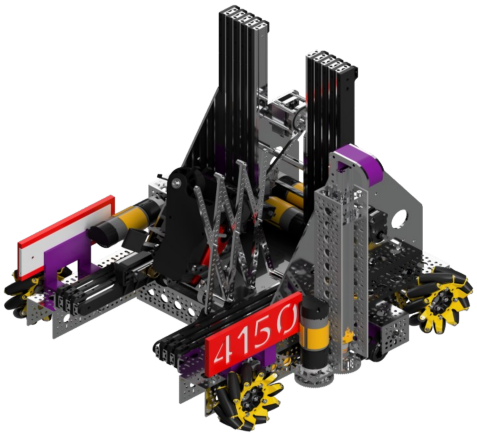
4150 Dark Matter

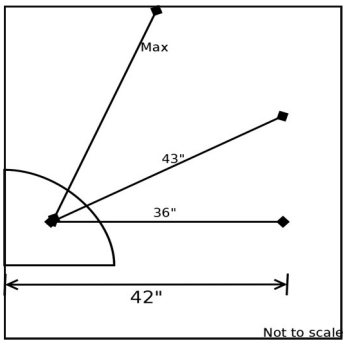
Think Award



Throughout the past few months, Dark Matter has been hard at work preparing for the League Championship competition. This event was the single factor on which teams made the cut and advanced to the FTC state competition. Through arduous modeling work, and consistent updates to the robot, we won the Think Award at the League Championship. This award prioritizes documentation on each team's engineering process, and after evaluation, the team that adapted and reflected on the overall journey most was given the award. For Dark Matter, this is shown the best in our Engineering Portfolio, containing many graphics and explanations of past ideas and prototypes, and a conclusive final design. We also directly communicated how our strategy for the Into the Deep game has changed over the season. The benefit received from the

10107 In Theory

Dynamic Extension Limit



According to Game Rule R104, our robot cannot extend past 42 inches during gameplay. Our arm is capable of violating this limit at lower pivot angles. Thus, when creating the software to drive the arm, we employed some trigonometry to determine the maximum allowable extension at the current pivot angle. It will not allow the driver to extend the arm past the limit, and if it would become past the limit while the driver is pivoting the arm down, it will automatically retract the arm to stay legal. The picture above is an approximate depiction of how this works.

4324 Lost In Time

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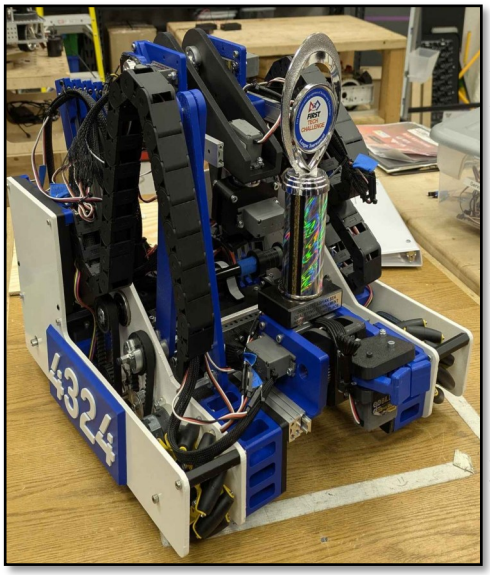
LEAGUE TORNAMENT

Lost in Time had a spectacular performance in the Caspian League Tournament. We were chosen by the sixth seed team, 10110 Pixel Knights, to be their alliance partner for the playoff rounds. While we tied our first match against seed 3, we lost the tiebreaker.

However, we nevertheless qualified to advance to the Iowa Championship as the 4th team to advance out of the 12 from our league. We won the second place Inspire award, which is runner-up to the most prestigious award of the tournament. The Inspire award is a testament not just to our robot performance and design, but also to our resolute endeavors to change the community around us. From CAD models and material testing to food packing and home remodeling, our team demonstrated a consistent motivation to better not

THE ROBOT

Our robot, named CHRONOS, functions with two separate manipulators: an intake and an outtake. This allows both manipulators to be specialized for their own separate tasks. However, this forces the system as a whole to be extremely complex: with 3 motors and 9 servos, the manipulator has 3 axes of extension, 4 rotational mechanisms, and 2 pincers. Our programmers streamlined the operation of the manipulator with a custom, finite state machine system. With the press of a button, the manipulator will snap to a present position and lock certain motors. For instance, the sample pickup state will extend the intake arm, rotate the pincer down, and only allow the pincer to open and close until the driver selects another



Mentor Spotlight

Jerry Berns

Jerry Berns is the a coach for all four Linn-Mar robotics teams. He has been with Linn-Mar robotics for around 15 years. Jerry does a lot for the teams he coaches. He used to primarily teach students how to use Autodesk as, when he first joined, the robotics teams used it for their CAD. Autodesk was one of the main reasons Jerry joined robotics. When he first heard about the Linn-Mar teams it was from his daughter who told him that they used Autodesk and that he could. Jerry agreed and loved the concept so much he stayed on as a mentor for nearly two decades now. Now Jerry mostly helps the teams with concept designing and hardware. Jerry has made a bg impact on Linn-Mar robotics in more ways than one. His, self proclaimed, biggest accomplishment was getting the teams to use CAD models as a building off point when making robots. Before, teams would design on pen and paper and use trial and error to build prototypes. Jerry showed them the usefulness of having a fully built diagram to go off of, saving hours of time. Jerry has also been recognized by the FIRST organization as aa whole through the Woodie Flowers Award, which he won in 2020.

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