

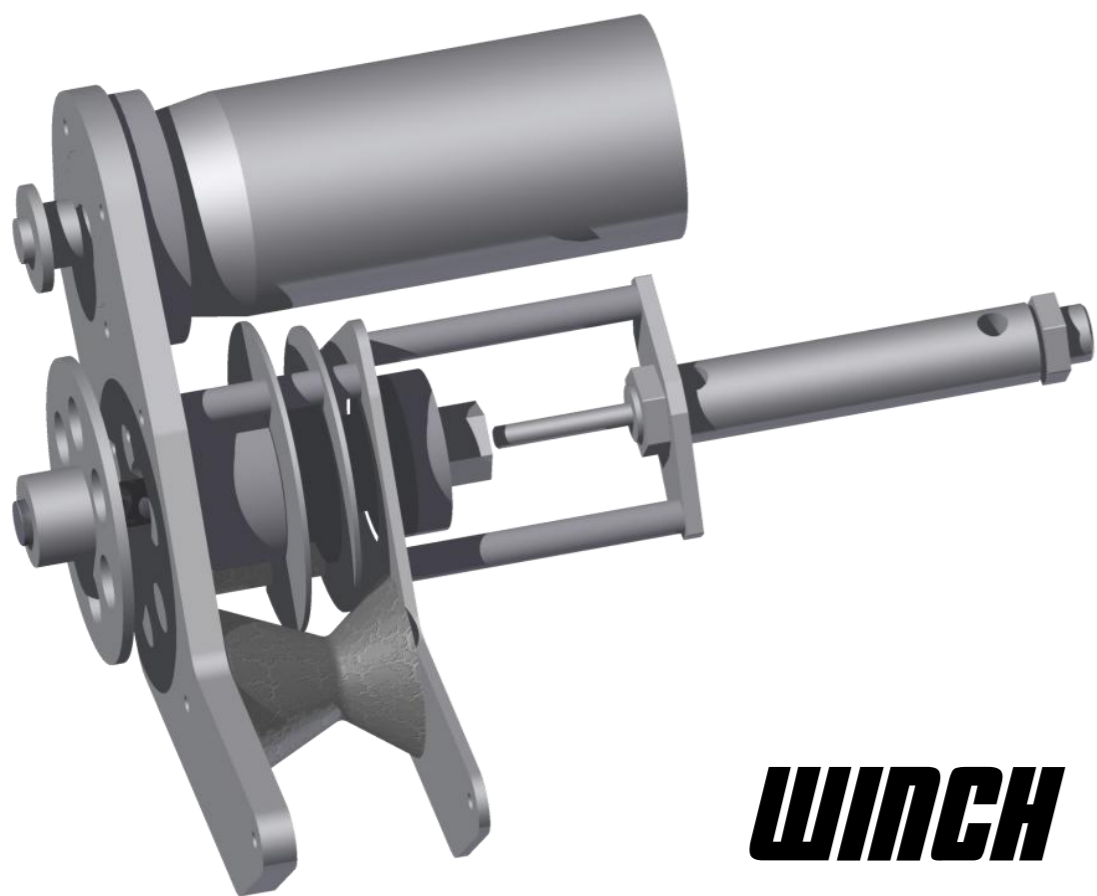
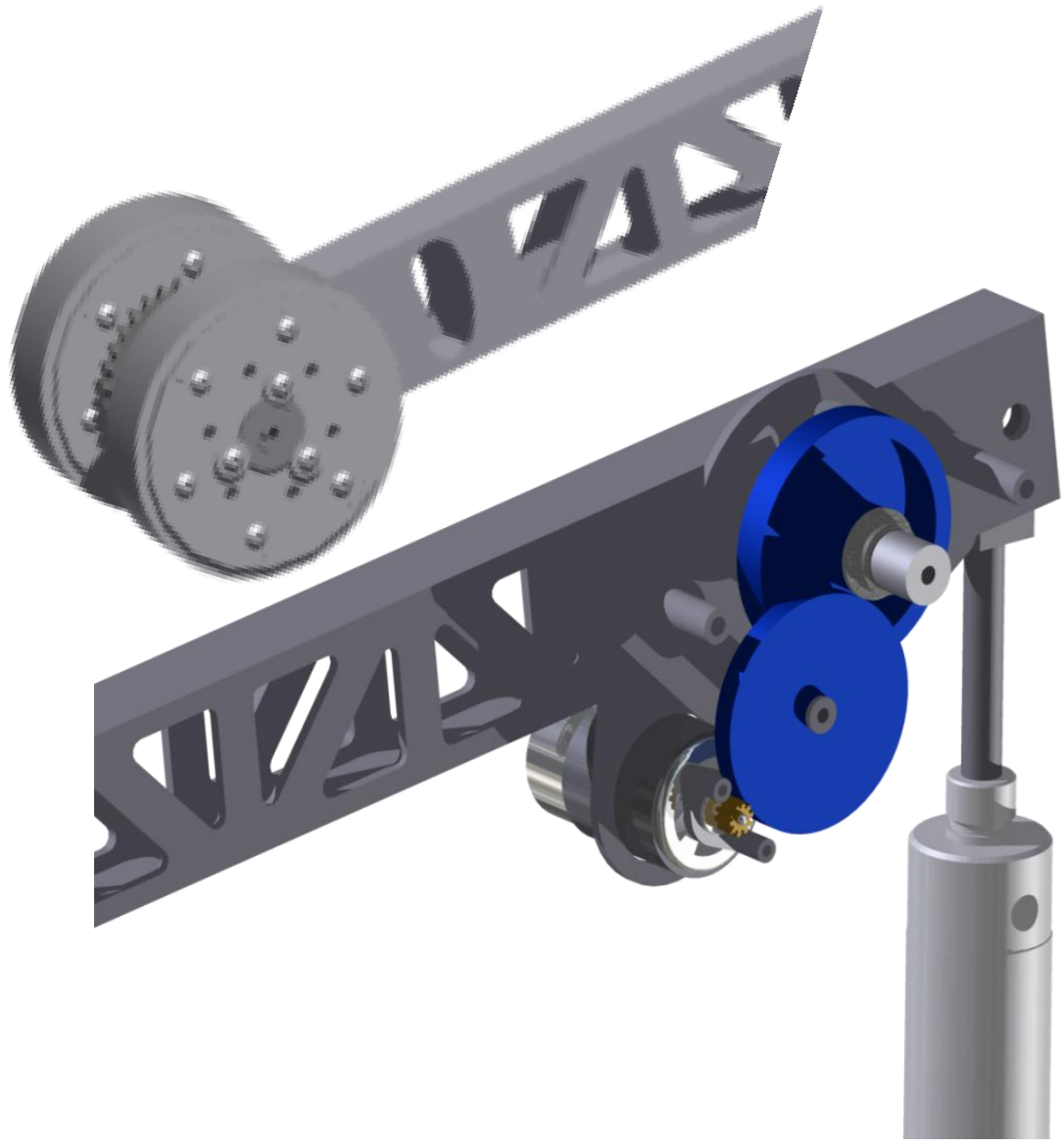
TEAM 1114 PRESENTS SIMBOT SS — SIMPLICITY IN DESIGN

ROLLER CLAW

During the design process it was decided that having a fast and reliable pickup was a priority. Pinch claws typically require precise positioning to be effective. As such a roller claw was chosen. The roller allows the ball to be secured as soon as contact is made, thereby reducing the amount of accuracy needed. This allows us to pickup from various angles, and/or while being defended.

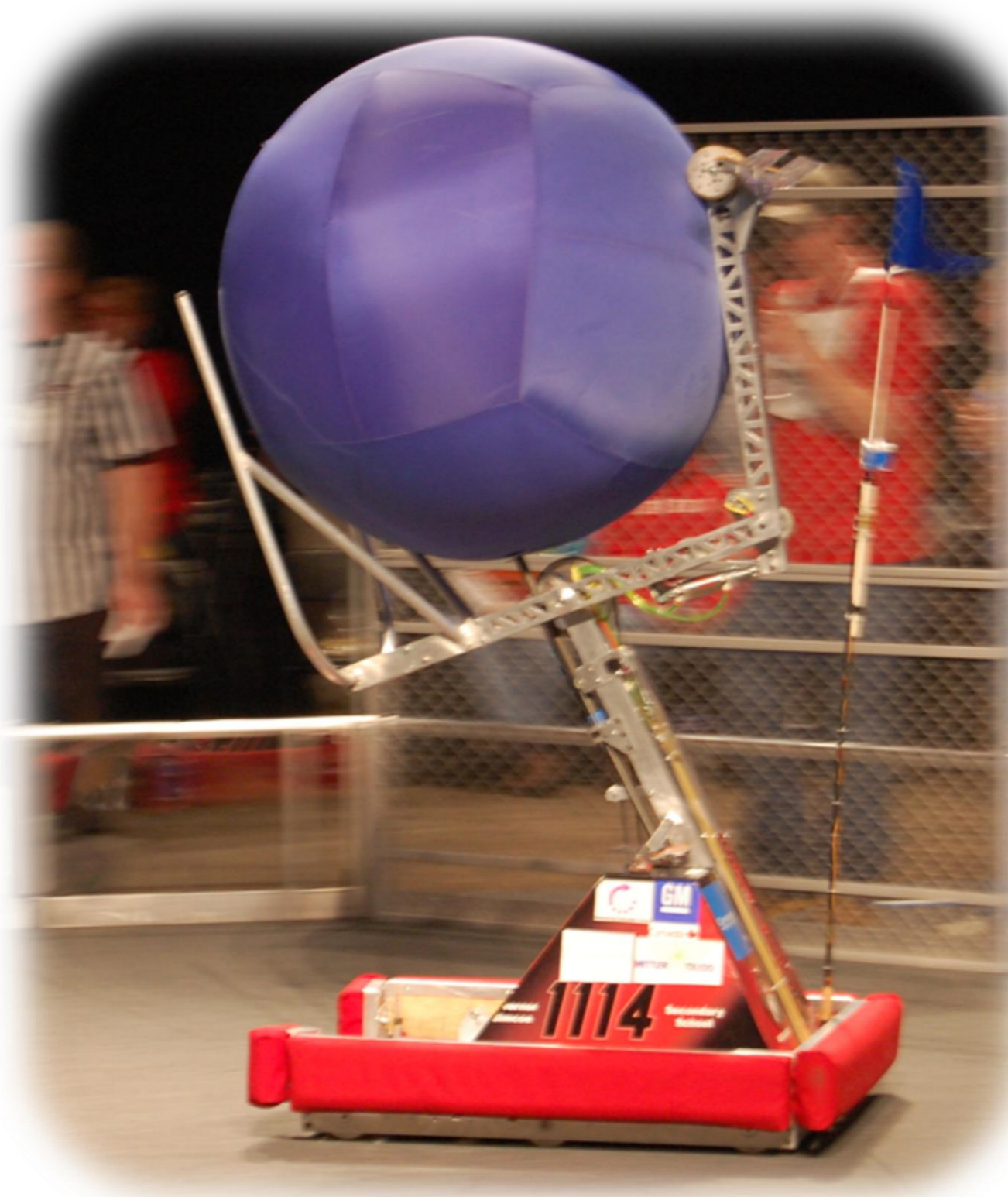
ARM

A key to this year's game is the ability to navigate through tight spaces. As such we chose an arm that barely extends past our robot's footprint. The overall arm design is seamlessly integrated with our launcher allowing for hurdling to be done in a smooth elegant motion. A stationary aluminum bar with lexan flaps, mounted at the end of the arm, is used for quick and consistent removal of balls from the overpass.



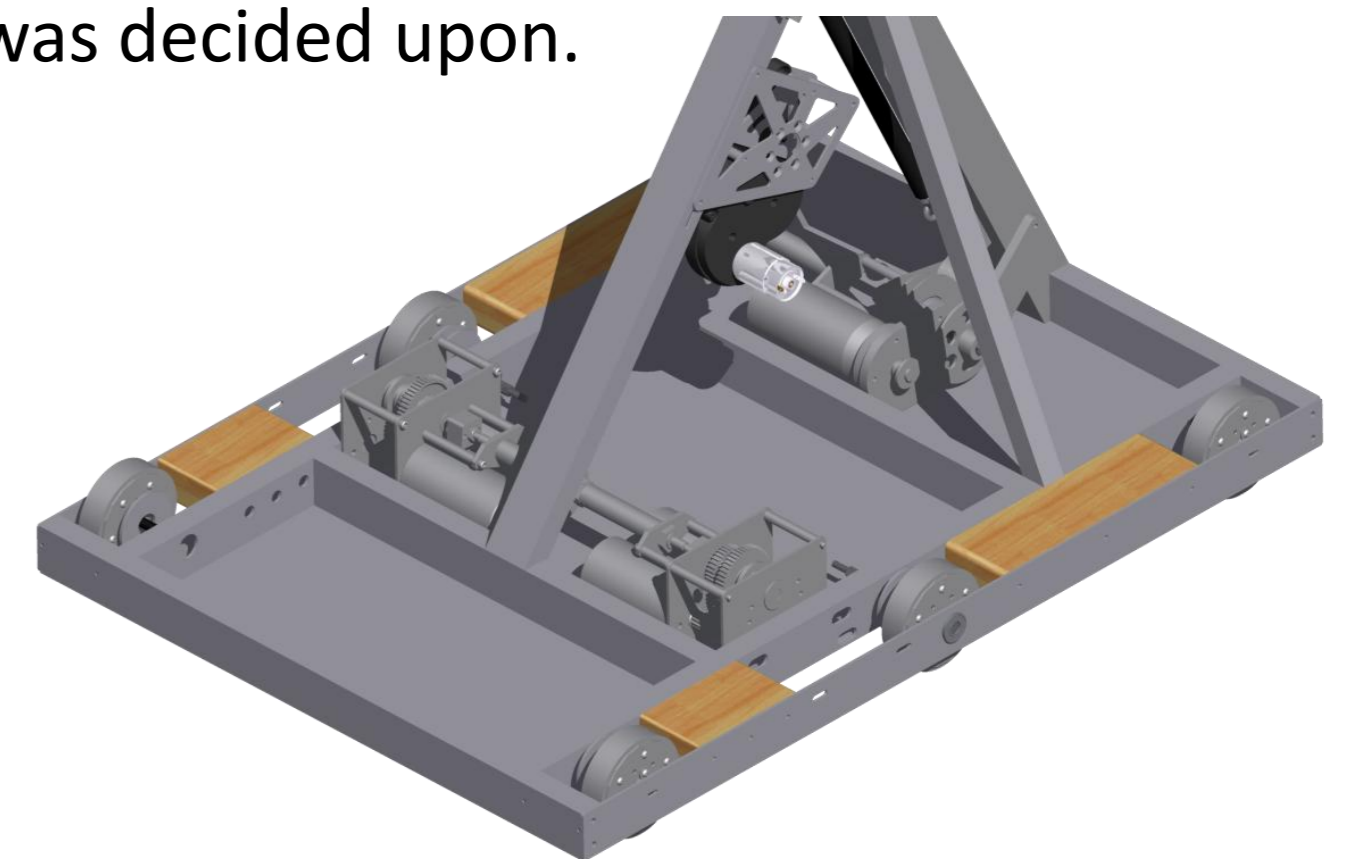
WINCH

In order to have a linear punch launcher powered simply with surgical tubing, a winch was needed to retract the punch and stretch the tubing. The winch is powered by an off-the-shelf drill transmission which does not backdrive, thereby holding its position even when unpowered! A simple cylinder disengages a dog gear allowing the winch to free spin and release the punch.



DRIVETRAIN

The drivetrain is the single most important subsystem of every *FIRST* robot. A simple design six wheel was chosen over more complicated steering concepts to allow our drivers more practice and programmers more opportunities to work on hybrid mode. The open layout allows easy access for maintenance. Despite the need for speed in this year's game, due to potential congestion on the field, added strength was desirable for certain "pushing" situations. Thus, a two speed drivetrain was decided upon.



LAUNCHER

A linear punch was chosen for our launcher as it elegantly fits into the framework of our arm and claw, maintains the desired level of simplicity and provides a powerful and effective means of hurdling. Surgical tubing was chosen to power the launcher to eliminate use of additional motors.



OVERALL DESIGN

Simbot SS was designed with simplicity as the number one priority. A simple design is less likely to fail, and is easily constructed allowing for more time to tweak and practice.

In order to ensure a simple design, a considerable amount of time was spent laying the robot out in CAD, to find an arrangement that allowed for effective launch, pickup and starting positions, while still maintaining a single joint and ensuring the robot never exceeded the height of the overpass. This allowed for a simple mechanism that allows us to hurdle without having to stop to re-orient the arm.

