

CASE STUDY

# Crystal Spring Uplands School

## Optimizing a Robot

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### The First Robotics Team

Elliot Owens, a senior at Crystal Springs Uplands School in Hillsborough, CA, contacted Pensa Labs with the opportunity to sponsor their team in the first Robotics Competition. It would be the first year the Crystal Springs Uplands School would be competing. Under strict rules, limited resources, and time limits, teams of 25 students or more are challenged to raise funds, design a team “brand,” hone teamwork skills, and build and program robots to perform prescribed tasks against a field of competitors.

The robotics challenge, called the Aerial Assist was a combination of soccer and basketball played with 2’ diameter inflated exercise balls.

### How the D.I.Wire Plus was used

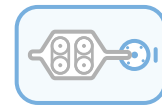
For the Crystal Springs Uplands School, the D.I.Wire was a tool for building lightweight structures quickly, without extensive tooling or training. For their robot, all of the electronics were attached to the base of the robot with a custom wire grid. 1/8” steel rods were soldered together with a propane torch and plumbing solder. Normally, when set up side to side, only 5 motor controllers (Jaguars) could fit into the base.

The D.I.Wire made the front cage for the robot out of hexagonally bent pieces of wire. This keeps the ball in contact with the rollers at all times while protecting the delicate electronics below. Additionally, custom mounting brackets were made for various components. The Festo solenoid valve is attached to the side of the robot with a custom “U” shaped piece of wire with threaded ends. The D.I.Wire was also used to make a protective camera cage. Lastly, custom “U”s protect the pneumatic valves.

### What was the end result

The Crystal Springs Uplands School robot competed in the Silicon Valley Regionals. They went 7-4 in the qualifying matches and were the only rookie team to advance to the elimination rounds. By the end of the competition, they placed 12th out of 59 teams, making them the highest ranked rookie team.

**Machine Used:**



D.I.WIRE PLUS

**Industry:**



ROBOTICS

# Work Samples

