

Girl “Mainstay”

88678A



Huanzhen Cao

Fall 2018

Our Story

We come from GZFLS, a normal Chinese middle school in Guangzhou. We don't have particular school support or very good resources; our school never has a glorious history on robotics competition. In fact, few people at our school know about robotics competitions like VEX.

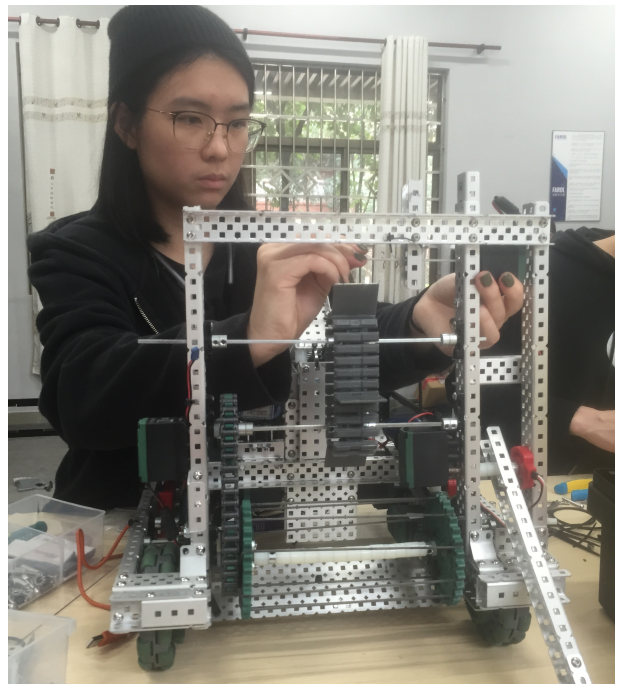
We're essentially alone—with our coaches.

But we want to change. We want to achieve something—prizes, our skills, fellow students' participation, and most importantly, our passion for robots. And the two girls in our team make all these possible.

Haozhen is our top robot builder. She is in love with physics and mechanics.

What makes her unique and so important to us is not her knowledge in physics, not her talented designs, not her drawings and notes of our robot parts, but is her perseverance—the spirit that motivates her to go on even though there're obstacles ahead.

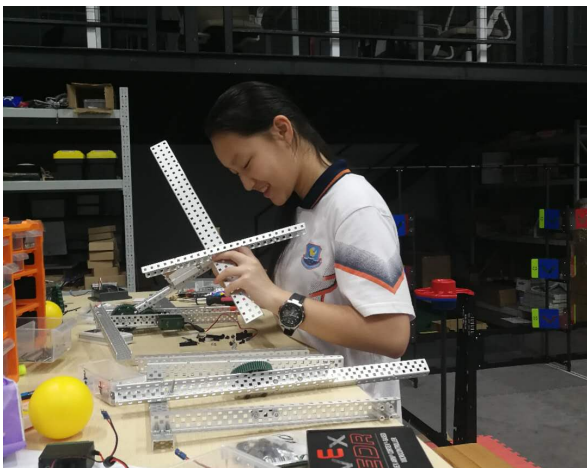
The very first time I noticed her is when we began to build the new robot about 3 months ago. It was at the laboratory and I went there one afternoon to help the group work. We almost finished the base of our robot and we were thinking about the shooting, the collecting and other structures. Some space was left after the shooting and the collecting structures were installed, and we wanted to fill it up to keep the balance. Haozhen was considering the mechanic arm. She wanted to put the metal stick aside the robot. She actually measured the appropriate distance for 5 times to ensure that the stick won't be too long that robot's movements might be affected. She then planned to use this



Haozhen was assembling the robot carefully.

stick as a way to tip off the plate on the post. In this way, a single metal stick was not enough; we needed to add a hook so that we could grab the plate as the mechanic arm touch it. She then took hours to choose the right metal part to be the hook. Still, we needed to make this arm movable, that it could move up and down and bend. After days of considerations and calculations, she finally decided to use two shorter-than-original metal sticks to replace the original one. She also added a motor at the junction part of two sticks to make it movable. It took her another day to determine the right number and the right position of the motors. After all these, she again noticed a small problem, that when the mechanic arm touched the ground, the sharp end would penetrate into the soft cushions on the ground, make the robot unable to move. But if we reduced the length of the arm, then it would be unable for us to touch the plate on the high post. To solve this dilemma, she decided to take the wheels. With the small wheels at the end, now the arm would not affect the robot's movement at all.

A single mechanical arm is just one small thing; actually, it doesn't matter too much. But to make it usable and reliable, Haozhen has to consider all circumstances and makes small changes every time a problem occurs. One would have to test the machine again and again, every day. It's tedious and when you meet a dilemma, it's also disturbing. But Haozhen took it all with her perseverance and patience, and made a perfect an arm. She definitely helped our team a lot.



Shiyue stayed up late and was examining a specific robot part(shooting device) that we were testing in order to write down a clear record.

Now finishing talking about our engineer, it's time for our "record girl" to come on the stage. Shiyue is not the chief engineer, not the person for contacting other teams, not the head of the team who needs to coordinate everything; but she plays a key role in our project: keeping records in detail.

Apart from the utilitarianism idea of the prize for top engineering log, a good record of our team's work can help us a lot. We can learn from our previous experience whenever we encounter problems later so that we can solve them with much ease. Plus, having a track of the whole development and construction of our robot can help us see the general trend of our

modifications.

Shiyue is always the faithful recorder. She keeps every major event of our team's work on record, and she also focus on numerous details. She seldom directly builds the robot, but she always observe and supervise the whole project, knowing when to write records down.

Last time when we went to Yongzhou, a city in Hunan Province, to take part in an regional tournament, one thing happened there left me a deep impression.

We found out that our robot's shooting part had some problems, that it could not aim at the flag precisely. Because our design didn't have a specific part for the plates or the posts, so we had to make sure that our shooting system is at good conditions. We immediately set out to fix this problem. We weren't quite sure what exactly caused that problem, so we had to eliminate possible ones one by one: metal box, rubber bands, motors, etc. It took us hours to fix it and test it. We worked till 2 or 3 am tomorrow morning.

Since this was a very significant mechanics failure, we needed to record it down in case something like this happened again. Also, this can be a valuable case for us to study so that we can avoid certain malfunctions. Since we worked late, she had to stay up late with us to record everything: every modification we made, every shot we tested, every analysis we did, every hypothesis we had. We could see her sitting on the ground, writing on our activity log and drawing sketches. She really had done her job excellently.

VEX is a robotics competition, but it's far more than just robots. Each team member has his or her own work on different parts: robot design, robot assembly, engineering log records, contacts, etc. Each of these work is important and our team can succeed only if all of us have done our job properly. So these two girls in our team are indispensable; their contributions are crucial to our progress. Girl Powered here is not merely a slogan; it means that girls' works matter and girls can do their jobs as perfectly as anyone else. Shiyue and Haozhen's work not only achieve that, but also show us their passion in VEX. So Girl Powered here has another meaning, which is that girls can be equally powered by their love and passion in this competition, and we believe they have achieved more than that.

Team Number: 88678A

Names of team members: Huanzhen Cao, Muiyang Ye, Chaolong Tang, Haozhen Zheng, Shiyue Wang, Yuxin Guo

Title of Submission: Girl “Mainstay”