

Entach

Revolutionizing location tracking


The robotics club has seen a number of successes in the two and half years of its existence.

Since Mr. Schlenker and I started it in May 2011, the robotics club has grown from a new organization with no definite aim to the seasoned group of engineers it is today. We've devoted ourselves to the "FIRST Tech Challenge" and "Block Party" is the game we'll be playing in this year. That's the FTC kickoff we went to the first year. If you look closely, you can see Mr. Schlenker!




Since that very first kickoff, we've accumulated a much better understanding of the rules, awards, and what it takes make a terrific robot. In fact, we had passed the qualifier round and made it to states, one level below worlds! We even managed to pull off some awards.

Many say we did "fine," and we did! We had learned the rules of FTC pretty well, and made some cool robots out of it. However, I'm convinced "fine" is never enough. New ideas and new challenges have presented themselves this year and changes need to take place. The biggest challenge on our list is the technical problem having an insufficient autonomous program.




FTC matches consists of two sections, a 30 second Autonomous and a 2 minute Driver period with a 30 second End Game totaling up to 2 minute 30 second matches. In Autonomous period, robots are completely unmanned, controlled only by a pre-written program, while robots in Driver period are controlled by a PS3-like controller.

For the past two years, we have yet to complete a successful and complex autonomous program by competition time. This was extremely annoying, because other teams would have autonomous programs and have an advantage over us.



After some thinking on the issue, our team eventually came to a conclusion: getting from point A to point B autonomously is pretty darn difficult. If you think about what it took to get GPS working, they had to launch tons of satellites, coordinate with the government, and put specialized chips and antennas into each GPS device. Unfortunately, we weren't allowed to use GPS... So, we had to come up with something else. After spending the four months on the issue, we eventually came up with a solution we're calling...



“Entach.”

Entach is a sensor that will tell your robot where it is in the form of x and y coordinates measured in centimeters. It's remarkable. All you need to do is plug in an x and y coordinate into the program and the robot will drive straight there! Here's a little demo. (explain demo)



No matter what numbers you feed into the program the robot will drive straight there. But, how does it work? Entach has a unique sensor called an encoder. The encoder has the ability to track the rotations of an axle via a small camera and an etched disk on the axle, like a CD. The stationary camera detects changes in the etches as the disk rotates. The camera and disk then feeds the information back to a computer as seen here.



Now, by feeding this information through some equations, the end result the location of your robot in x, y form. Thus, we've been able to achieve a level of precision that very few teams have been able to achieve.



So, we have the location of our robot at our disposal. What can we do now? The first is a fully functioning autonomous, and the second, some autonomy in driver mode. A robot can be incredible at putting rings on pegs, balls in crates, or cubes on swings,

but if the robot can't get to the scoring area in the first place, those abilities are completely nullified. This was why we couldn't have an autonomous for those two years. Trying to make an autonomous without knowing your location is a mess!!!

Also, there is a possibility of putting little pieces of Autonomous in driver mode. Finding the exact line to place a ring on a peg can be difficult. Entach can potentially correct your line and place the ring on the peg for you!



At this point I'm pretty sure I've convinced you that ***I'm*** excited about this, but I probably haven't convinced everyone why ***you*** should be excited about this. I realized something profound this summer: one should always push for accelerative progress, because being "fine" is never enough. As you mature, you start to notice something. As quoted from Steve Jobs, "Everything around you that you call life was made up by people that were no smarter than you, and you can change it, you can influence it, you can build your own things that other people can use." End quote. You ***alone*** have the power to change the rules; you ***alone*** have the power to change the world. Back in April 2012, we could've easily continued without an autonomous program and say that we were "fine." But, why settle for "fine" when all the power in the world is available

to us to make a difference, to make the world better.



That is what Entach represents: the opportunity to turn our team – our world – from “fine” to *extraordinary*. Thank you.