Competitive athletes have a constant objective of improving their performance. In order to do this, the athletes and their coaches adopt a wide spectrum of methods to get the necessary feedback of athlete performance.

One sport that does not have such a system is the javelin throw in the sport of track and field. Javelin throwers and their coaches have difficulty getting performance feedback, because the few systems that currently exist are both bulky and expensive, and/or require a controlled environment with an indoor facility, 8-10 high speed cameras, and force sensors.

Team #15 Coach Jav, made up of four electrical engineering students, designed a device to record data from a javelin throw and send it to the athlete or coach. Specifically, the coaching tool combines multiple sensors (gyroscope, accelerometer, and GPS module) to collect data, crunch the numbers with a microprocessor, and transmit the useful information through Bluetooth communication to an Android mobile device application.

Using this device, the coach or athlete can see the velocity of the throw, the angle of release of the javelin, and the distance thrown, all in real time. The coaches or athletes can use the quantitative data to effectively assess the athlete’s performance, monitor their progress, and help the athlete see what they are doing well and what they can improve upon.

Throughout the year, the team kept to the design norms chosen at the beginning of the year to govern the design process. These norms included trust, cultural appropriateness, and caring. The user needs to trust that the device will work reliably and give accurate data. Also, the device must be culturally appropriate to the sport, not altering the javelin or its trajectory in any way. Finally, the design is caring. For engineers, make sure that the design does not infringe on any current patents, but also make sure Team 15 and Calvin College protect their own intellectual property. For the athlete, the device helps them achieve their best, as Colossians 3:23 tells us that “Whatever your task may be, put forth your very best effort, as for the Lord and not for men”. 

Requirements

- Capture accurate and useful data
- Does not alter javelin or its trajectory
- Interface (app) easy to use and understand
- Withstand the elements – rain, mud, shock

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