

Blast Motion Sensor Augments Metrics with Adaptive Video

June 16, 2015 by **Bryan Cole** — [2 Comments](#)

The first thing to keep in mind about **Blast Motion**'s sensor is that it's not just designed for baseball. Yes, like the Diamond Kinetics SwingTracker, you can attach the sensor to the end of a bat to track swing speed and direction. And like the Zepp sensor, the Blast sensor can also be used to track a golf swing. But Blast's approach revolved around designing a high-quality, general purpose sensor, and then building specific applications for baseball, basketball, golf, action sports, and athletic performance around it.

"We didn't approach this as trying to design a swing sensor or a specific sport product," senior director of marketing Donovan Prostrollo said. "What we designed it to do was to be a natural motion capture product, and then we applied that to different sports, so it doesn't pigeonhole our product."

At the heart of the Blast sensor are inertial measurement units (IMUs), the combination of accelerometers, gyroscopes, and magnetometers that have become ubiquitous in devices like smartphones and tablets. But Blast has made two improvements to make the device more accurate. First, Blast Motion uses multiple IMU chips (although they wouldn't disclose how many) to capture a wider range of movements. Second, the Blast sensor was also designed to use what founder Mike Bentley referred to as "tactical-grade" technology, a combination of more precise sensors, more processing power, and on-the-fly calibration that improves the device's accuracy and consistency from one movement to the next.

But despite the intense technological focus, both Bentley and Prostrollo stressed the importance of keeping their outputs simple for the end user.

"You'll find other solutions out there really overwhelm users with numbers, which is both

good and bad, because if users don't know which number to focus on, you're not really helping them, you're actually potentially making it worse," Prostrollo said.

"At the end of the day, [the athletes] would love the technology to just completely disappear," Bentley added. "And that's one of the goals of Blast is how do we make the device disappear."

When compared to other bat sensor apps, Blast lacks the three-dimensional rendering of the swing. Instead, the Blast app revolves around video, typically captured by setting the device on a tripod and automatically clipped so that only the events of interest are included. Prostrollo argued that the focus on video gave Blast an edge in capturing the entire movement, not just key metrics.

"We decided from the beginning to capture video and do it natively as part of the app so it's really integrated into our DNA," Prostrollo said. "And the cool thing about that is when you pair video and you compare the level of consistency out of our product it really does an amazing job."

And Blast recently announced an **adaptive slow-motion** feature that adjusts the playback speed around the event.

"Basically, we know exactly when the impact occurred, when the swing started, and when the swing ended, and based on that we can speed up and slow down the video," Prostrollo said. "We can also take the metrics and overlay them on top to get this dynamic fill, so it's not just a metric in isolation."

Blast verified the accuracy of its metrics using motion capture systems. As an example, Prostrollo said the system was within 1 mph of the motion capture system "85 percent of the time" and Bentley claimed that the Blast system "outperforms our optical system when you talk about rotational velocity" as verified by higher-end devices more commonly used to test aeronautical and military-grade IMUs.

Bentley and Prostrullo stressed not only the device's accuracy but also the device's consistency, so that identical swings or jumps would produce identical sensor readings. They attributed this consistency to improvements in their manufacturing process, and claimed it made a big difference to the professional athletes they collaborated with.

“The challenge is pro athletes absolutely can recognize that day one, the amateur athletes won't necessarily realize that a product's not as accurate as they want until it's too late: they've purchased it, they've gone out, they've tried it, and they wonder why their swing speed varies by 6 mph when it's all the same,” Prostrullo said.

Despite being a relatively new company, the founders of Blast Motion have been in the inertial sensor business for a quarter of a century. Before entering the sports world, their focus included military and medical products.

“This is not the first sensor we've ever manufactured,” Bentley said. “When we originally designed the sensors, it wasn't for a single application. We wanted to be able to use the sensor and cross-pollinate across all applications.”

As Blast Motion began adapting its offerings for new markets, it worked with coaches, professionals, and other subject matter experts to design useful applications. But Bentley said there was a lot of overlap between the biomechanical elements underlying the different sports. Even more surprising, he said, was the overlap between social circles across different sports.

“What's pretty unique about when you do get into the inertial world of working with different professional teams, how many baseball players work with professional golfers, and how many golfers play with hockey players,” Bentley said. “So the world is pretty small, and when you get a pretty exciting product, the word travels pretty fast in those worlds.”

The company currently works with a number of action sports ambassadors including Mike “Hucker” Clark and Greg Lutzka, as well as some NBA and MLB players they declined to

name, citing confidentiality. And Blast Motion is working closely with bat manufacturer Easton as it gears up to release the **Easton Power Sensor** this summer. Little information is currently available about the project, but judging from the screenshots in the **iTunes App Store**, the interface at least will be very similar to **Blast's Baseball Replay app**.

Looking to the future, Prostrollo said the biggest change would be not on the technological side but rather on the adoption side, as wearable sensors like Blast become more and more ubiquitous among both amateurs and pros.

“We’re at the point now where the average consumer has access to this technology, it’s no longer the pro athlete,” Prostrollo said. “What you’re going to see is a whole new generation of athletes leveraging the data and the technology, having a history to go back on, and really be able to do something very meaningful and different with that.”

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About Bryan Cole

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