

# Virtual reality becomes a reality for college football



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(Photo: Walt Beazley, Razorbacks Communications)

FAYETTEVILLE, Ark. — When he put on the mask and slipped on the headphones, [Brandon Allen](#) wasn't sure exactly what he was getting into. Then it began — and he was "engulfed."

Arkansas' senior quarterback is among a growing number who sees — and feels — the potential of virtual reality in college football. Created by STriVR Labs, a start-up company grown out of a former Stanford kicker's Master's thesis, the technology is still in its infancy. But the universal first impression of the virtual reality trainer is something like this:

"It's insane," says Arkansas coach [Bret Bielema](#), who adds: "This changes the game."

When Allen slipped on the gear — an [Oculus Rift](#) headset, followed by a nice set of headphones, he was suddenly standing not in the conference room adjacent to Bielema's office, but in the quarterback's position on the practice field. Looking straight ahead, and then scanning left and right, he recognized the defensive alignment and saw how the offense was arrayed. Then Allen turned around. Behind him, a running back awaited the snap.

"You think you can touch the guy," Bielema says. "Like he's right there."

A voice barked out the cadence. The ball snapped. As Allen watched, a play unfolded.

"You could look anywhere you wanted," Allen says. "You could watch the whole play, or behind you. It was so realistic that way. You could go through your keys and your reads. ... You felt like you were actually in the practice."

Engulfed. Or, as STriVR founder and CEO Derek Belch would say: immersed. And to the growing numbers who have experienced it, the possibilities are seemingly endless.



Arkansas quarterback Brandon Allen says STriVR's system is virtually like being in practice. (Photo: Kevin Jairaj, USA TODAY Sports)

Seen initially as a way to train quarterbacks — mental exercises, in essence, to reinforce actual practice repetitions — the technology has already morphed into use with other positions. Enterprising coaches have brainstormed ways to employ virtual reality in recruiting, too.

The current STriVR client list includes Stanford, Arkansas, Auburn, Clemson, Dartmouth and Vanderbilt, as well as the Dallas Cowboys. That's nearing the limits of what Belch's group can handle — at least for now. But it's only the beginning.

"There's no stopping this," Stanford coach David Shaw says. "We know that. ... It won't be too long until it's all over the place."



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Shaw's team was the earliest user of the technology — used, Shaw says, as "guinea pigs" as Belch and Stanford professor Jeremy Bailenson explored ways to shoot video during practices last season. Shaw prompted Belch last December to leave his position as a graduate assistant with the Cardinal football program to pursue the new business. The coach also provided some of the seed money for the start-up (which for now, in a Bay Area tech company cliché, is based out of a residential garage).

"This is really cool," Shaw says. "This is something that could inspire people. This is gonna change my profession, this is something that is gonna change, potentially, athletics to some degree. At the very least, four or five different sports are gonna be different four or five years from now because of this."

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Belch, who kicked the winning extra point in Stanford's upset of USC in 2007 — a victory that started the Cardinal on its current path of success — first considered virtual reality in football when he took a class taught by Bailenson in 2006. Comm 166: Virtual People explores "the concept of virtual people or digital human representations; methods of constructing and using virtual people; methodological approaches to interactions with and among virtual people; and current applications. ...."

Afterward, Belch suggested the professor build a virtual reality trainer for football.

"Back then, the technology wasn't good enough," Bailenson says. "I said, 'Come back when it gets better' — and he did."



Belch and Bielema review STriVR's capabilities in the Arkansas football meeting room. (Photo: Walt Beazley, Razorbacks Communications)

Bailenson's research into how people learn in a virtual environment spans almost 20 years. He has consulted with the military; his lab has drawn visits from presidents of companies and countries. A few weeks after spending three hours in Bailenson's lab, Facebook founder Mark Zuckerberg spent \$2.3 billion to purchase Oculus.

There have been several important technological advancements in the field in recent years, but among the biggest breakthroughs is the development of high-quality and relatively inexpensive headsets. Even a year ago, Bailenson says he "would have been terrified" to deliver a system to a client because the helmet would have cost \$40,000. But Oculus Rift's Development Kit 2 retails for \$350.

When Belch began his graduate work, he and Bailenson agreed his thesis should focus on the potential for virtual reality in football.



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"Goal No. 1 was to do a good enough job to get an 'A' on the project," Belch says. "No. 2, help Stanford football. Floating in the back of our minds was No. 3, find a way to do this commercially."

Last season, with Shaw's blessing, Belch shot video each Monday night, concentrating on opponents' defenses from the quarterback's perspective.

Bailenson says he recognized they might have something special when Shaw first put on the headset. The coach's immediate reaction was twofold: We need this, and, how can I keep you from giving this to my competitors? But Bailenson didn't realize its potential value to football until he watched an NFL team practice.



USA TODAY Sports' Paul Myerberg weighs in on five players that who will make an impact on campuses this football season.

"I didn't know how precious and rare a moment on the field surrounded by the starters was," Bailenson says, "even how rare it is to get the starters reps. If we can create an immersive virtual reality experience that makes the quarterbacks and other players feel they're on the practice field, we've hit a home run."

Bielema says virtual reality might be most useful, at least for now, in teaching Arkansas' schemes to incoming freshmen from the inside out and for preparing backup players who don't get as much work in practice as starters.

"Anytime you can get a rep — it's as close to a practice rep as possible — all it can do is help," Auburn coach Gus Malzahn says. "It's really good."

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STriVR isn't the only start-up in the early stages of a virtual reality system. EON Sports counts Kansas, Ole Miss, Syracuse and UCLA as FBS-level clients. Unlike STriVR, EON uses video game graphics; according to founder Brendan Reilly, that allows the system to be interactive.

"There's no way to interact with the video — yet," he says. "Maybe in two years. But you have to be able to interact with it, because you have to have the ability to fail and do it and process."

With EON's system, an entire playbook can be input with little effort.

"Every coach we showed it to asked, 'What if I want to move that linebacker?'" Reilly says. "So we designed an X's and O's playbook that allows you to create simulations that coaches are comfortable with. It breathes life into the X's and O's."



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Reilly says EON Sports has sold packages to nearly 100 high school programs — \$799 for an annual license — and is on the verge of adding a \$39.99 smartphone version that includes interactive training programs and a series of prepackaged plays.

"Where this has the most dramatic impact," Reilly says, "is on the 14-year-old in Kansas who doesn't get elite level training. ... We're democratizing it. Any kid who wants to get better can use it to get better."

But STriVR's pitch — and what Belch and Bailenson say is the most important difference between his product and others — focuses on the reality part of virtual reality.

"Real bodies," Bielema says. "It's not animated electronics. It's not like playing Madden. It's live bodies with live mechanical body movements. It's voices. You hear coaches talking. You hear the things you hear on the practice field."

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It's that, well, reality that entranced Trent Edwards. The former Stanford quarterback had finished several years in the NFL and was looking for what comes next when he visited his alma mater last November. He'd been teammates and friends with Belch, who was a groomsman in Edwards' wedding. When he tried out the STriVR system, he was hooked.

"I really like what this does in the sense that it develops trust with yourself," Edwards says. "You've got coaches and other players on the field with you. It's a perspective that no sideline (video) footage and no end-zone footage can ever capture."

Edwards took off the headset and asked Belch for a job. His card reads "Vice President of Business Development — though with only a half-dozen employees, the titles are essentially meaningless.



Former NFL and Stanford quarterback Trent Edwards works for STriVR and would love to have had it as an active player. (Photo: Kevin Hoffman, USA TODAY Sports)

Although Belch hopes for rapid expansion, the company's growth is at least initially limited by logistics — with so few employees, there are only so many man hours to go around in servicing clients — and when it comes to the West coast, by a promise. Stanford is the only Pac-12 program that will use STriVR in 2015; Belch told Shaw he wouldn't pitch it to any rivals until next year.

In February at the NFL Combine, STriVR pitched its still evolving system to several NFL franchises. Then Belch and Edwards went on a cross-country tour, pitching several college football programs. Though Belch won't disclose specific pricing, he acknowledges he was told by an NFL executive to charge \$250,000 a year — because, Belch says the executive said, a team would be "picking up half a coach." Several of the colleges aren't paying quite that much, though as STriVR's services evolve, the price structure probably will, too.

Shaw says he expects most major college programs will be using virtual reality within two years, and predicts it won't be long until the product, in some form, trickles down to the high-school level. For now, many of the staff hours are spent turning the video into useful virtual reality footage. It is gathered by mounting multiple cameras on a four-foot tripod in the offensive backfield.

So far STriVR has concentrated on building libraries of basic plays for each client. After shooting at spring practices, Belch and his team took the video back to that garage, then returned to campuses a few weeks later to deliver it. But in the near future, Belch hopes to be able to reduce the turnaround time, allowing teams to use virtual reality video tailored to specific game plans.



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<http://www.usatoday.com/story/sports/nfl/2014/12/12/virtual-training-reality-practice-eon-sports-brendan-reilly/20284053/>

On a Friday, for example, a scout defense could work through blitz packages unique to the next week's opponent. By Sunday evening or Monday, the video would be available for quarterbacks to begin using.

"We're hoping to kind of close that gap to make it quicker and more efficient," Edwards says. "Coaches are used to filming where by the time they get into their office (after practice), the film is on your computer. That's not reality — but the goal is to get it there."

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Everywhere STriVR was implemented last spring, someone seemed to come up with a new idea. Auburn quarterback Jeremy Johnson recalls the first play he saw, from a seven-on-seven drill shot during spring practice.

"Once he cut the play on, I actually went through all my progressions," Johnson says. "You really just scan the defense for all the coverages. Whatever coverage they roll to. You can see everybody. It's like watching film, but you're there. You see everything."



But coaches experimented with shooting video from the perspective of safeties, middle linebackers, even centers.

"This has quickly moved from a quarterback tool to something we can use for every position on the field," Belch says.

The creativity wasn't just limited to on-field usage. Bielema and Malzahn have seen value in recruiting, as well. In the not so distant future, assistant coaches could take laptops and headsets with them on the road. Without setting foot on the Arkansas campus, a recruit could be standing, at least virtually, in the locker room with potential teammates, listening to a pregame pep talk. Then he's in the tunnel as the players storm onto the field, or on the sidelines. Then he's in a team meeting — "second row, third chair to the right," Bielema says — listening to Bielema speak.

Bielema had Belch shoot video inside each of the Hogs' meeting rooms during position meetings.

"If we've got an offensive lineman (recruit) visiting in the middle of June, he can go into a meeting room (virtually) and feel like he's sitting in that room," Bielema says. "Just some crazy recruiting tools."

If the possibilities with virtual reality seem endless, they just might be.

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