

URL: <https://stvp.stanford.edu/clips/be-bold-and-nimble>

Stanford mechanical engineering Professor Chris Gerdes explains his team's research comparing the performance of their automated vehicle, Shelley, versus two professional race car drivers. The humans had a slight edge over Shelley because they drove their car to its limits and adapted to the path that opened up in the moment - an insight entrepreneurs should heed, Gerdes says.



Transcript

- So we plotted all of the data and we looked at what JR was doing, we looked at what David was doing, and we looked at what Shelley was doing.. And in fact there was a stark difference that really stood out to us.. Shelley, as we had designed her, was following the exact same path every time because that's what we figured we needed to do.. We found mathematically the best path, and doggone it we were gonna stick on it.. Neither David nor JR did that.. In fact they took a slightly different path every time around the racetrack.. When we originally looked at this we thought that was just because they were trying to get to our ideal path and missing.. But we couldn't have been farther from the truth.. What in fact they were doing was pushing the car to its limits and taking the path that opened up for them at that moment in time.. They were prioritizing always being at the limits of the car rather than following one specific path..

As JR looked at the data and looked at what Shelley was doing, he told us, if Shelley was a human driver I was coaching, I would tell her she has her priorities exactly backwards.. That instead of focusing on this path and exactly where I wanna go, what Shelley should be focusing on is how to use the friction between the tire and the road.. If she comes into one turn a little bit quickly, she needs to basically swing a little bit wider, keep the speed up and adjust.. If she comes in a little bit slowly, she can make that turn a little bit sharper and needs to turn earlier.. But by following this one path, we were kinda missing that opportunity.. So as we came in thinking that we were trying to solve one mathematical problem, that we were trying to find this very best path around the track and then drive it reasonably well, we found that the best human drivers did exactly the opposite.. They found the physical limits of the car, they pushed the car to its limits, and they took whatever path was open to them as they did that.. And that made them significantly faster.. This is a really interesting result.. It was an interesting result from a research standpoint..

It's motivated a lot of our current research to try to figure out great, how do we capture that capability in the car? But it's also something after reflection, I realized was sort of a more general way of living life, which is really to think about pushing to the limits of what's possible and seeing what paths open up when you do.. So a lot of times with startup companies, this is sort of referred to as the pivot.. Right, as you get into the market, as you actually start to flesh out your idea, you often discover that this great plan that you had isn't working quite as well as you think.. Or maybe the plan is working fine, but there are other opportunities that are now open to you if you're flexible enough to take them.. This is as somebody who programs automated vehicles, this is the sort of thing that we look at humans and just marvel at their capability to be flexible, to adapt, to sort of take advantage of these opportunities that arise for them, as opposed to following the predetermined path.. And so the lesson that I've really taken from this is to find the things that we like to do in the lab, find the things that we do well, do them as well as we can, but not be worried about exactly what sequence of events we're gonna be taking in the future.. But to be very flexible about what research paths we take based upon what we've learned in our current path, to adjust, to adapt, to use that human flexibility to our advantage.. So this is something that I found a lot in life.. I like to have a plan a lot of times, right, okay I'm gonna do this and then I'm gonna do that, and then I'm gonna do this.. But in reality if you wanna be fast on the racetrack, the plan gets you into the corner, your skills get you out quickly..

If you hold onto that plan, you're slow, on the racetrack or potentially in business...