For Virtual Racers, A League of Their Own

By ROBERT PEELE

HOW does it feel to go flat out into a turn at Indy with all four tires fighting for grip, or to drift out of the narrow groove at Darlington into an unforgiving swath of slick asphalt? What's it like to pick your way through the traffic at Daytona with nerves rubbed raw and Dale Earnhardt Jr., inches off your rear bumper?

In the world of virtual racing, aspiring champions — few of whom have ever been behind the wheel of a real racecar — are coming closer than ever to finding out. They're doing it from their dens and living rooms, using simulation software developed by companies like iRacing.com, a subscription-based online racing service that started last year.

Few sports lend themselves to virtual re-creation as well as auto racing. The view through a windshield is a lot like a computer's display screen, after all, and the you-are-there perspective of in-car cameras has long been a staple of race-day telecasts.

Racing simulations have been around since at least the late 1980s and have become more sophisticated as processing speeds and bandwidth have improved, drawing an intensely committed core of devotees.

While technology advances are part of iRacing's business plan, the company is also trying to bring another dimension to sim racing's future: a vision of Internet racing as a recognized competition with its own global sanctioning body, a place where an amateur racer can have a fulfilling career and where professional drivers can hone their skills.

"We want to recreate the sport of auto racing in the virtual space," said Steve Potter, a spokesman for the company.

Based in Bedford, Mass., iRacing was founded in 2004 by David Kaemmer, a longtime game designer, and John Henry, an investment manager and the principal owner of the Boston Red Sox. Mr. Kaemmer, iRacing's chief executive and software mastermind, and a former driver in the Skip Barber open-wheel formula car series, had previously developed racing simulations like Nascar Racing: 2003 Season and Grand Prix Legends for Papyrus Racing Games.

Unlike those titles, iRacing is exclusively an online service, focused entirely on real-time multiplayer racing — in other words, members race against one another, not in a single-player mode against computer-controlled cars. And while other simulations like Live for Speed, the GTR series and rFactor offer realistic driving dynamics and impressive visuals, what sets iRacing apart, according to Mr. Kaemmer, is its degree of fidelity to the real-world cars and tracks it depicts.

The authenticity sought by iRacing requires a mountain of primary-source data. Parts and components for each car model are precisely weighed and measured to assure that the feel of each type of racecar is faith-

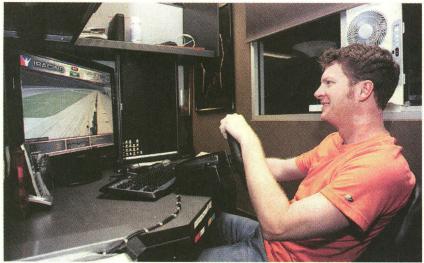**GATHERED** Scanning the Fountain Turn at the Long Beach, Calif., course.

COMPILED Millions of data points form a "point cloud" image of the turn.

Virtual Racing's League

HAROLD HINSON

PRACTICE Dale Earnhardt Jr. turns virtual laps. Below, a Nascar simulation.

fully rendered; a virtual wind tunnel helps to simulate aerodynamic effects. And Mr. Kaemmer's team of engineers have developed a proprietary tire model that not only reproduces forces, heat and wear over varying speeds and weights, but also responds to changes in the track surface.

But perhaps the most crucial aspect of iRacing's commitment to accuracy is in reproducing the actual racetrack.

"The laser scanning is probably the biggest leap forward," Mr. Kaemmer said, referring to the three-dimensional mapping process the company has used to build digital facsimiles of more than 60 tracks. It's a painstaking process; it takes about eight hours for a scanning crew to cover half a mile of track. But when the scan is complete, iRacing has a "point cloud" picture that mimics, within millimeters, the track surface, including every crack, patch and bump.

How much do little things matter? A top-level driver notices even the most subtle differences in track surface or visual cues, as Mr. Kaemmer's first test laps on the digital version of Lime Rock Park in Lakeville, Conn., demonstrated.

"I really knew it like the back of my hand," he said, referring to his many races at the real Lime Rock. "The track surface was right. The placement of the curbing was just as I remembered. But something was just a little bit off."

After consulting with the 3-D-modeling artists responsible for trackside objects like trees, buildings and advertising signs, he uncovered the problem. "It turned out the artists had placed the tree trunks according to the tree canopy," Mr. Kaemmer said, meaning the trunks had been drawn in where the artists thought they ought to be, rather

than by following the precise data gathered in the track scan. When the artists went back and placed the tree trunks using the scan data, suddenly everything seemed right.

What results from this meticulous attention to detail is a level of difficulty that may be intimidating to the casual gamer and sometimes frustrating to the novice sim racer. In contrast to racing video games like the Midnight Club and Need for Speed series, simulations are designed not for ease of play, but to replicate the actual driving experience. The iRacing cars can be hard to handle, and the tracks are indeed constructed with all their quirks and imperfections intact.

But such accuracy impresses professionals like Dale Earnhardt Jr. "Ninety-nine percent of the time it mirrors real life," he said. "There are all kinds of little intricacies and oddities in the setup that I can duplicate."

Alex Gurney, who teamed with Jon Fogarty to win this year's Daytona Prototype championship in the Grand-Am Rolex Sports Car Series, used iRacing to train for a tricky series of S-curves at Virginia International Raceway in advance of a race there in April.

"After practicing for countless laps on the sim, I was able to adjust my driving line just slightly," Gurney said in an e-mail message. "When I arrived for the race weekend, I went through the esses section exactly like I had on the sim and

it was immediately better."

Gurney and Fogarty won the race.

Because drivers are required to race under their real names on iRacing, it's possible that a member could find himself on the starting grid next to Earnhardt or Gurney — or Joey Logano, or Marcos Ambrose or Justin Wilson, among other professionals who compete on the site.
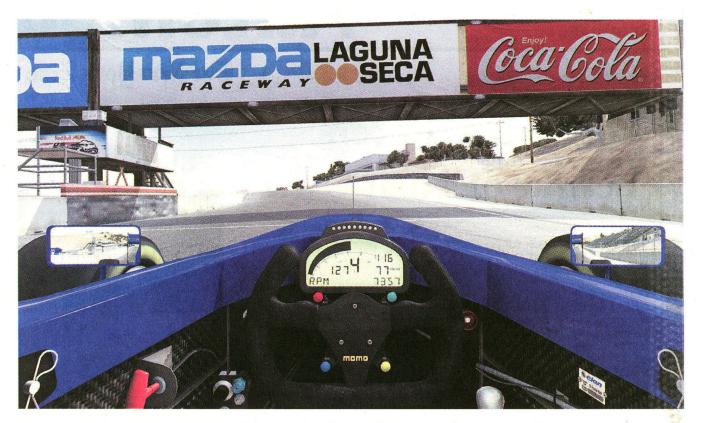
The iRacing simulation has yet to duplicate the fully immersive experience that an actual racecar offers. The software supports only a wheel-and-pedal interface; according to Mr. Potter, a cost-effective seat module that reliably reproduces a racer's seat-of-the-pants feel has yet to be made.

And there are other items on the company's wish list. "We'd like to add the ability to cook your clutch," Mr. Kaemmer said, "or break some gears."

Certain aspects of racing will probably never be reproduced in a simulation, of course. "Things like the noise, the heat, the sense of speed — those type of things take some getting used to," Earnhardt said, speaking of the rubber-and-asphalt racing experience. "And take some guts and grit."

If it can never fully replicate the real thing, iRacing nevertheless hopes to be a valuable tool in driver development. "Doing the simulation online teaches you probably 95 percent of what you need to know to be a real racecar driver," Mr. Kaemmer said. And the company is already trying to find out how to bridge that final 5 percent.

A milestone was reached in August when John Prather, a top iRacing.com driver with no previous on-track racing

REALITY CHECK Accurate graphics, as in this view of the Laguna Seca racetrack, are expected in racing simulations.

it was immediately better."

Gurney and Fogarty won the race.

Because drivers are required to race under their real names on iRacing, it's possible that a member could find himself on the starting grid next to Earnhardt or Gurney — or Joey Logano, or Marcos Ambrose or Justin Wilson, among other professionals who compete on the site.

The iRacing simulation has yet to duplicate the fully immersive experience that an actual racecar offers. The software supports only a wheel-and-pedal interface; according to Mr. Potter, a cost-effective seat module that reliably reproduces a racer's seat-of-the-pants feel has yet to be made.

And there are other items on the company's wish list. "We'd like to add the ability to cook your clutch," Mr. Kaemmer said, "or break some gears."

Certain aspects of racing will probably never be reproduced in a simulation, of course. "Things like the noise, the heat, the sense of speed — those type of things take some getting used to," Earnhardt said, speaking of the rubber-and-asphalt racing experience. "And take some guts and grit."

If it can never fully replicate the real thing, iRacing nevertheless hopes to be a valuable tool in driver development. "Doing the simulation online teaches you probably 95 percent of what you need to know to be a real racecar driver," Mr. Kaemmer said. And the company is already trying to find out how to bridge that final 5 percent.

A milestone was reached in August when John Prather, a top iRacing.com driver with no previous on-track racing experience, was offered a chance to compete in a real-life S.C.C.A. VW Jetta TDI Cup race at Road America. "This was a monumental moment for the sim racing community," Earnhardt said.

Though Prather may not have finished as high as he would have liked — after limited practice time he placed 23rd out of 26 drivers — Earnhardt came away impressed with his performance against more seasoned racers.

Next year, one iRacing.com member will earn a full-season ride in the Jetta TDI series. The exchange program will work in both directions, with officially sanctioned Nascar and Indy Racing League online series set to begin at iRacing.com in 2010.

For at least one professional, the gap between virtual and reality has narrowed enough to give digital racing yet another touch of authenticity.

"I get nervous before sim races," Earnhardt said.

Gentlemen, Start Your PCs

GETTING started on a virtual racing career at iRacing.com requires, at the least, a relatively recent PC with a Windows operating system. (Note to those who worship at the Apple altar: though its name might suggest otherwise, iRacing will not run on a Mac unless Windows has been installed.) A broadband Internet connection is strongly recommended.

Basic car controls — a steering wheel, gas and brake pedals — can be purchased for $40 or less; serious competitors typically advance to so-called force-feedback steering wheels, which replicate on-track jolts and turning effort to give the driver a more realistic experience. Such sets, like the Logitech G27, can be bought for less than $300.

A three-month iRacing subscription costs $36; a year's subscription is $99. Once the iRacing software is downloaded, users are given three beginner-level cars — a Pontiac Solstice, a Legends Ford and a Spec Racer Ford — and access to seven tracks.

Members can purchase additional cars and tracks for testing purposes, but they can compete only at their license levels, a rating based on their skill and safety record. There are six levels, starting at Rookie and advancing to Pro Series, where drivers like Dale Earnhardt Jr. compete.

The simulation's official sanctioning body, First, organizes more than 17,000 subscribers into a coherent competitive structure and enforces the site's racing guidelines. On-track etiquette is one of iRacing's basic tenets, as is evident in the First sporting code, a 58-page PDF.

ROBERT PEELE