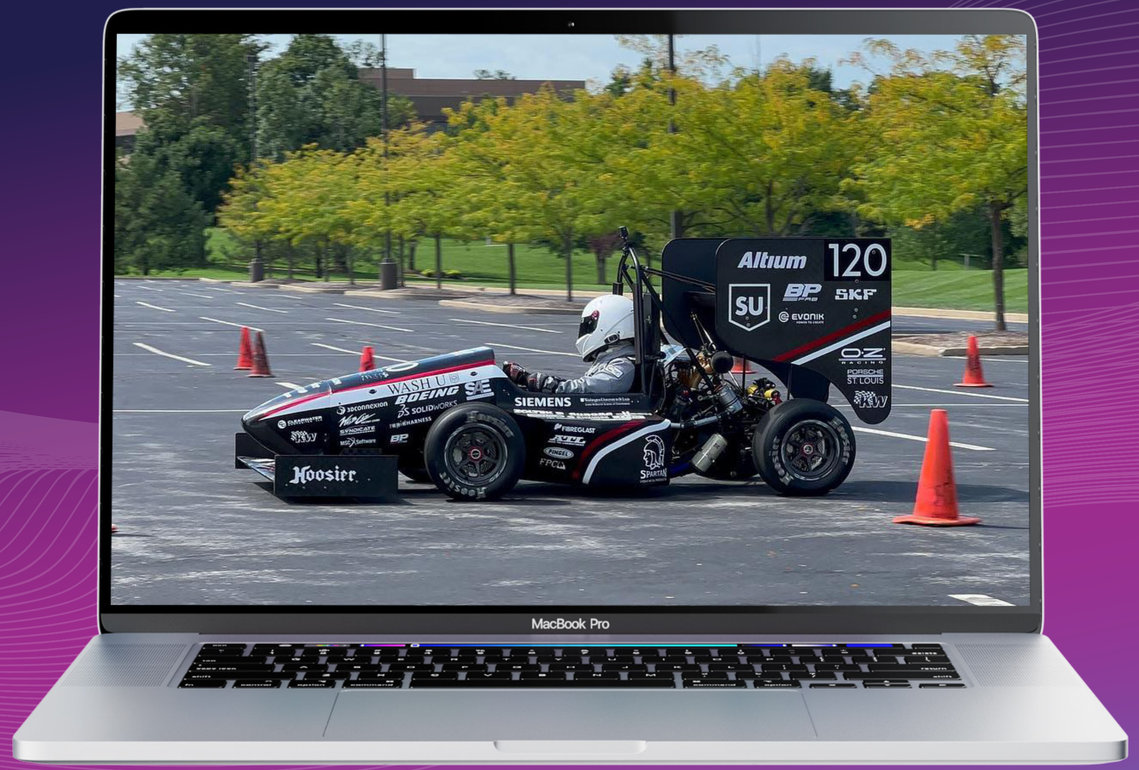
SCICHART



Case Study

Customer:

WashU Racing

Industry:

Automotive

WashU Racing validate their designs with a wide range of sensors, including pressure sensors and onboard GPS telemetry to ensure their vehicles are operating at peak performance.

Who is WashU Racing?

WashU Racing is a student-run Formula SAE team based out of Washington University in St. Louis. Every year, they build a Formula-style race car to compete against 100+ universities around the world. From computer scientists and mechanical engineers to business students, they are an extremely diverse, cross-functional team.

With the final competition in May, it's important that they test the car throughout the year to ensure that their components work as intended, which they source from comprehensive data.

WASHU RACING

What software do they use?

As long as the car is on, WashU Racing is constantly sending sensor measurements and driver inputs to a designated laptop via an RF radio operating at 10Hz.

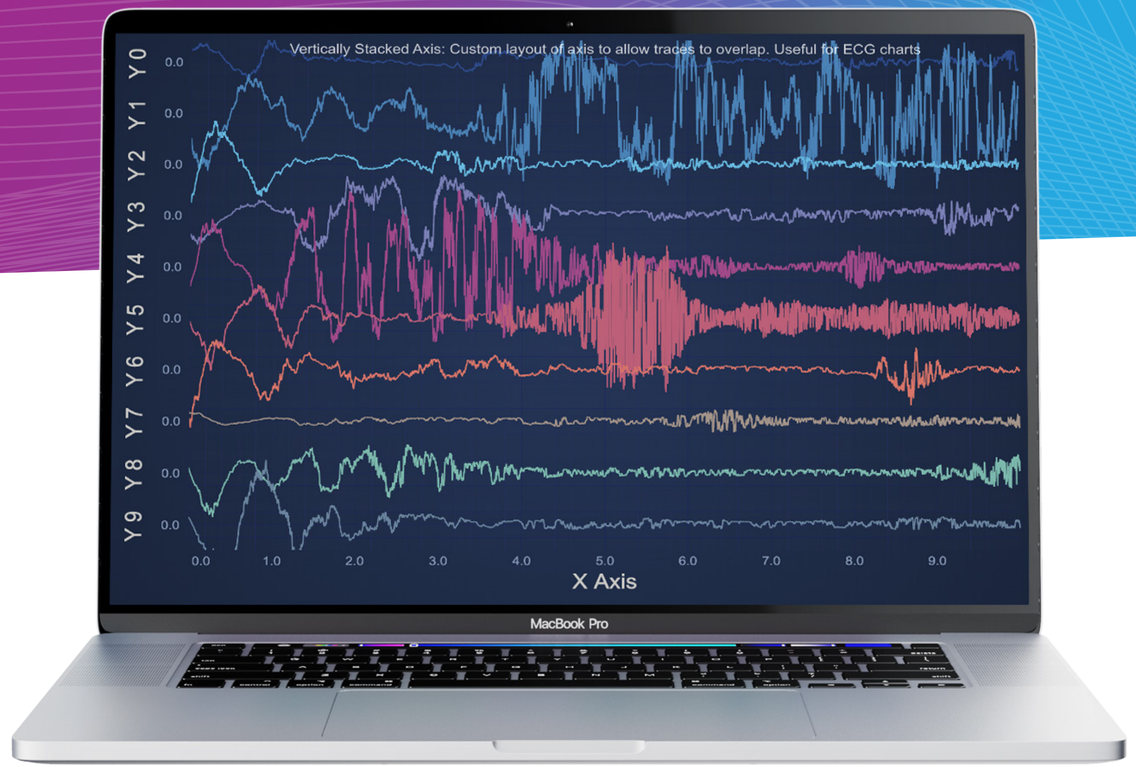
This RF signal transfers a string of comma-separated values to the website's backend, which allows them to store the data for future analysis.

The data is then sent via API calls to our Vue.js frontend, which uses SciChart Line and Scatter plots to display our data.

What drawbacks did WashU Racing come across?

Before their Live Telemetry Dashboard, WashU Racing's testing data had to be taken from the car via Ethernet after each testing day. This slowed data analysis, reduced the effectiveness of their data, and was an overall clunky way to retrieve data.

Furthermore, looking into products such as Mclaren ATLAS, the team discussed the possibility of creating a similar system. After many whiteboard sessions and scratch pad drawings, they eventually came up with a working system.



Unlocking WashU Racing’s potential:

How did SciChart help?

System Performance

Every sector of WashU Racing’s multifaceted team benefit from SciChart’s robust technology.

The aerodynamics team design and create a bespoke aero package, consisting of a front wing, rear wing, and side pods. In order to quantify the improvements made from their efforts, WashU Racing needs testing data to show how exactly our car has improved year-over-year.

Their suspension team need live data on the vehicle’s g-forces and ride height as it moves through corners. The Performance Engineer also uses live telemetry to coach drivers through their performance, monitoring key inputs to develop strategies for minimizing lap time.

Continues overleaf >

Creating a track map with SciChart Scatter Plots

This element allows WashU Racing to use their latitude and longitude data to create a live map of the race course.

It's important to keep track of their map, as the team is constantly changing the track when testing in order to test different aspects of the car.

Creating a throttle position graph with SciChart and VUE.JS

They now use SciChart's line graphs to create a Throttle Position graph over time. This graph is also compatible with CSV files from previous testing runs, allowing us to not only see live driver performance but compare our drivers' performance with each other, as well as with previous testing data.

As WashU Racing's throttle is an in-house component, we can also cross-reference this graph with our airspeed to ensure that our throttle is linearized to our specifications.

Further results

WashU Racing's live telemetry dashboard has greatly improved team performance, and allows for increased multifunctionality and cross-collaboration among departments.

The team has been able to learn and improve components, and the drivers have been able to study and improve their lap times.

WASHU RACING

★ ★ ★ ★ ★

"SciChart has significantly improved our data analysis process.

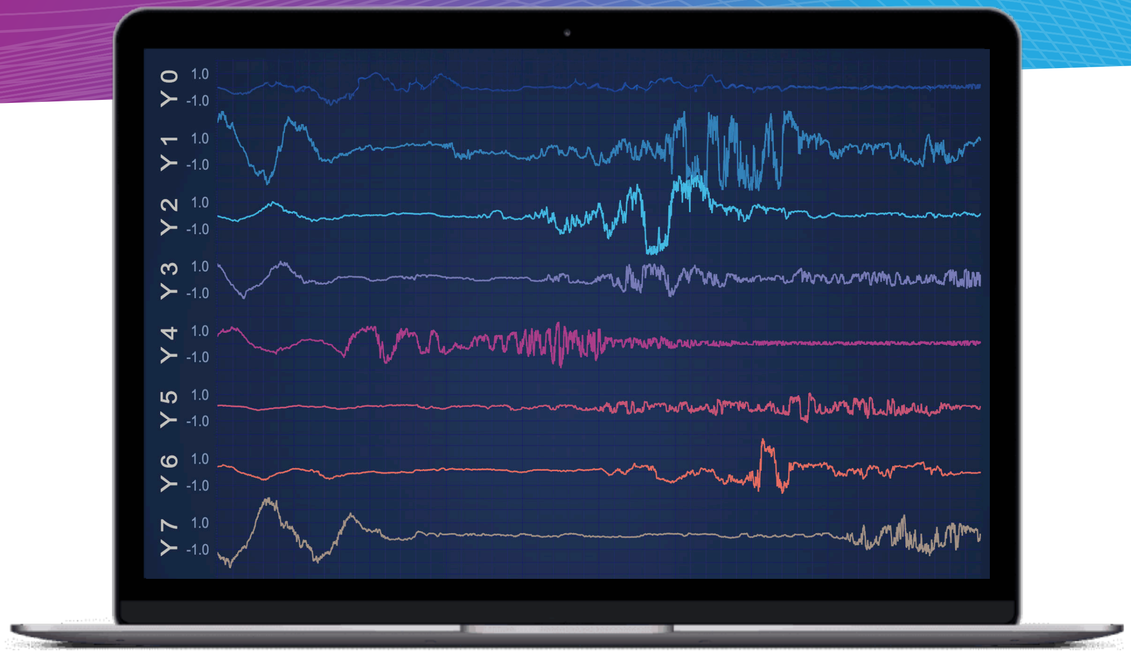
Before, retrieving testing data from the car was slow and cumbersome, but with SciChart's robust visualizations, we now have immediate access to key performance metrics.

This has made it easier for every part of our team - from aerodynamics to suspension, to analyze and improve performance more efficiently."

To follow along with WashU Racing's journey as they continue to compete in competitions, follow them on Instagram at https://www.instagram.com/washuracing/?hl=en and LinkedIn at https://www.linkedin.com/company/washu-racing/posts/?feedView=all.

Why choose SciChart?

SciChart has the capability to display multiple axes on both the X and Y axes, allowing for the presentation of multiple datasets with various scales on a single chart. It also provides cross-platform compatibility by supporting various platforms such as WPF, iOS, Android, and JavaScript.



This enables developers to maintain consistency in charting experiences across different devices and operating systems. If you require a streamlined process for capturing and annotating high-quality datasets, SciChart's software has you covered.

SciChart is well-known for its high performance in rendering, especially for real-time updates and large datasets, handling millions of data points smoothly. SciChart can easily be integrated into existing applications and frameworks using APIs for data binding. This allows seamless integration with various data sources like databases, CSV files, and real-time data streams.

About SciChart

SciChart is a cross-platform WPF, iOS, Android and Xamarin Scientific & Financial Charting Library.

SciChart supports the rendering of complex, interactive, real-time charts with many millions of data points for demanding scientific, medical and financial applications and embedded systems that require high performance, rich interaction and smooth updates.

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