Some Case Studies from National Instruments

Editor's Note: Do you have an interesting case study you'd like to see here? Send us yours at ecnereleases@advantagemedia.com [1]*, and we'll publish the best of them.*

NI LabVIEW and NI ELVIS Help Support MIT's iLabs Architecture to Remotely Connect Future Engineers

Researchers at Massachusetts Institute of Technology (MIT) recently developed iLabs, a set of standardized software tools and services used to deliver physical labs via the Internet, to help augment engineering curricula at schools around the world, from Africa to Australia. Each of the institutions using iLabs, including MIT, found that providing educationally appropriate labs that explore real-world phenomena has become more difficult for reasons ranging from equipment costs to constraints on laboratory space to reduced course time available for meeting graduation requirements within a complete, accredited curriculum.

Using LabVIEW graphical programming software and the National Instruments Educational Laboratory Virtual Instrumentation Suite (NI ELVIS), diverse

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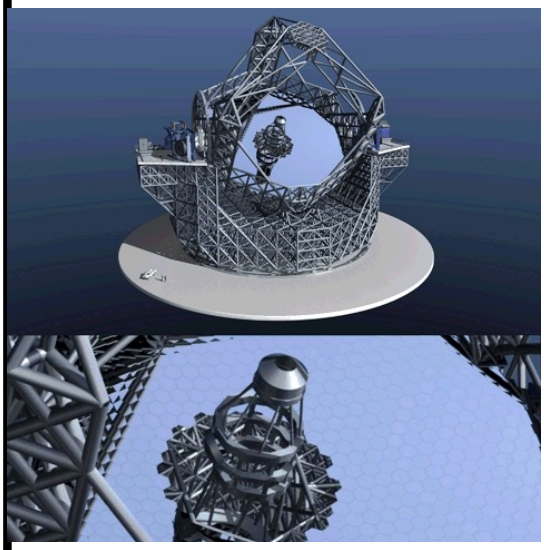
teams from multiple continents have shortened the development time of engaging, software-controlled physical labs that can be plugged into the iLabs framework and delivered to students worldwide.Click Here [2] to read more.



Developing Real-Time Control for the World's Largest Telescope Using NI LabVIEW With Multicore Functionality

The Challenge:
Using commercial off-the-shelf (COTS) solutions for high-performance computing (HPC) in active and adaptive optics real-time control in extremely large telescopes.

The Solution:
Combining the NI LabVIEW graphical programming environment with multicore processors to develop a real-time control system and prove that COTS technology can control the optics in the European Extremely Large Telescope (E-ELT), which is currently in the design and prototyping phases.

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Optimizing Professional Cyclists' Performance Using NI LabVIEW and NI CompactDAQ

In competitive cycling, the performance of the equipment and the rider's positioning can have just as big an impact on the outcome of a race as the athlete's conditioning. In a sport where the outcome may be decided by tenths of a second, it is critical that riders' gear, and their precise use of it, be impeccably tuned and synchronized for optimum performance.

Amateur and professional cyclists make our Colorado Premier Training wind tunnel a regular part of their off-season routine. Here, athletes and their coaches have access to the latest training techniques and high-tech equipment to measure aerodynamics and positioning, and provide feedback on how to overcome wind resistance and improve overall rider efficiency. Additionally, bike manufacturers use our wind tunnel to improve current designs and test new ones.

As much as 90 percent of the power an athlete produces is used to overcome wind resistance. Because wind has such a big impact on an athlete's performance, we use the latest National Instruments technology to acquire and analyze rider data so riders can make sure they are getting the most out of their training.

Athletes spend about an hour in the wind tunnel per session while our system gathers information related to a biker's riding position, heart rate, and other physiological parameters that influence performance. We acquire data and analyze it with NI CompactDAQ data acquisition hardware and a proprietary software program based on the LabVIEW graphical programming environment.

This combination of LabVIEW software and modular NI CompactDAQ hardware collects all the necessary data, including wind speed and drag measurements, and converts it into the number of watts the rider is producing. If necessary, we can manually input other variables, including temperature, humidity, barometric pressure, and air density, to get drag measurements and account for wind direction.

Click Here [4] to read more.

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