The University at Buffalo Enables Sentient Science to Become a Powerful Application on the Industrial Internet

Sentient Science, headquartered in Buffalo, NY provides computational performance product testing, life extension, remanufacturing, risk reduction and supply chain services to increase the remaining useful life of industrial assets in power generation and defense markets.

For the first time, Sentient Science is able to calculate the point in time when critical components and systems will begin to fail and make recommendations to extend the life of these components, systems and assets, creating financial value for its customers by reducing operations and maintenance (O&M) costs.

Company: Sentient Science
Industry: Prognostic technology and services
Location: Buffalo, New York
Website: http://sentientscience.com/

In June 2014, the White House honored Sentient Science with the SBIR/STTR Tibbetts Award for their DigitalClone multi-physics prognostic modeling simulator, which is now available commercially.

THE CHALLENGE

Today, Sentient Science is the leading provider of prognostic technology and services. Since 2001, the company developed multi-physics models, called DigitalClone®, that predict mechanical failures. This research led to a series of commercial tools and services to help manufacturers and operators of rotating equipment predict and extend their products' life and performance.

In order to meet business growth and market demand, Sentient Science requires advanced computing resources to run DigitalClone prognostic models.

NEW SOLUTIONS

The Center of Computational Research (CCR) at the University at Buffalo partnered with Sentient Science to provide access to their 3,400-processor, high-performance computing infrastructure.

By interfacing customers' DigitalClone prognostic models with high performance cloud computing infrastructure to run hundreds of simulations, Sentient Science supports what GE and others now call the Industrial Internet. Because Sentient Science has access to the most powerful computational resources in Western New York through CCR, they are now at the forefront of this new technology.

The University at Buffalo's CCR is a key partner for Sentient Science, enabling them to deploy these models and services to commercial and government customers. CCR provides access to its supercomputing infrastructure to host the DigitalClone models and run simulations, which allows Sentient Science to scale commercial revenues quickly.

This is all made possible through funding from the Division of Science Technology and Innovation (NYSTAR) of the Empire State Development Corporation (ESD) and the New York State Regional Economic Development Council.

MODELING AND SIMULATION

In addition, Sentient Science works with the University at Buffalo's Center of Advanced Technologies and Center of Excellence in Bioinformatics and Life Sciences (COE) and other groups on research and development funding proposals to continue to develop new prognostic capabilities. CCR has allowed Sentient Science to focus heavily on growing the commercial aspect of their company. In 2015, commercial sales represent 75% of Sentient's total business as it scales both its energy and industrial engagements.

These partnerships played an important role in the decision of Sentient Science to move its headquarters to Buffalo, NY. Today, 15 employees call Buffalo, NY home and Sentient Science plans to continue to invest and hire new employees in the area as they grow. The University at Buffalo's deep talent pool provides opportunities for internships and full-time positions with the team at Sentient Science.

RESULTS

Within the partnership and much credit owed to the University at Buffalo, Sentient Science has deployed their computational testing and asset management solutions on new commercial projects with John Deere, BP, Sikorsky Aircraft, Energy Northwest, Boeing, Minnesota Power, Westar, Penoles, the National Science Foundation, US Army, US Navy, US Air Force, Moog, Broadwind Energy, GE Wind Energy, Pattern Energy, Eaton, Parker, Duke Energy, Gamesa, Hendrickson, Exelon Corporation, NextEra Energy, NRG, Infigen, MidAmerican Energy, and Sun Edison.

Without access to the university's supercomputing resources, Sentient would not be able to provide their customers with the fast, affordable solutions they do today.

"We would not be able to commercialize our technology; especially at the rate and effectiveness we have, without the University of Buffalo CCR. We are now supporting over 6000 wind turbines on a 24 hour basis, simulating the remaining useful life of their gearbox drive systems using the CCR. This has been a very important and referenceable use case on how universities and private companies can work together." — Ward Thomas, President & CEO, Sentient Science

ABOUT CCR

The Center for Computational Research (CCR), part of the University at Buffalo (UB), is a leading academic supercomputing facility. CCR maintains a high-performance computing environment, high-end visualization laboratories, and support staff with expertise in computing, visualization, and networking.

The mission of CCR is to (1) enable research and scholarship at UB by providing faculty with access to high-performance computing and visualization resources, (2) provide education, outreach, and training in Western New York, and (3) foster economic development and job creation in Western New York by providing local industry with access to advanced computing resources, including hardware, software and consulting services.

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