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| **Case Study** | **19.10.2015** |

Good Vibrations

Predictive maintenance completed by vibration analysis is achieved with the help of Allied Vision.

Does this sound familiar? You begin driving your car and feel some level of vibration you never felt before. Instantly, it’s understood something is wrong and may have to be replaced. Vibrations can be quite informative in detecting faults in machinery. Consider the manufacturing industry. Companies value their machinery as it plays an integral role in completing the intended job. Unlike a car, the size of some machinery can be very large. It is undeniable wear and tear will eventually degrade these assets over time and consistent use. A common symptom indicating this is excessive shaking. The end result is the repairing or replacement of these assets to ensure the continuation of daily business functions. However, corrective actions can be done prematurely, which effectively wastes time and money. Predictive maintenance (PdM) techniques can assist in resolving this issue. PdM is used to help ascertain the condition of operating equipment to determine when maintenance should be conducted. In combination with innovative technology, PdM can be a big benefit to organizations. Allied Reliability Group is at the forefront of advancing PdM techniques with their product OptiVibe™.

 **OptiVibe™: PdM Completed By Vibration Analysis**Allied Reliability Group was founded in 1997 as Allied Services Group by John Schultz and John Langhorne. In its growth, Allied Reliability Group has become an industry leader in predictive maintenance and condition monitoring for the industrial and manufacturing sectors. By identifying defects in assets, Allied Reliability Group can measure return on capital investment in asset management using their self-developed, innovative method.

OptiVibe™ is Allied Reliability Group’s vibration analysis system that uses a digital machine vision camera to measure the displacement and motion of every pixel of the image, creating a visual illustration of vibration and motion. These easy to understand images of vibration are called Vibragrams™. VIbragrams™ were created by Jeff Hay, CEO of RDI Technologies, and licensed for use to Allied Reliability Group. OptiVibe™ uses the Vibragrams™ to provide a visual representation of the measured asset. In turn, users are able to view asset faults and make informed decisions. OptiVibe™ is capable of monitoring large or multiple assets, complex and/or large-scale structures, small elements on large or inaccessible structures and much more.

The following steps describe how OptiVibe™ works:

1. The user takes measurement without contact to obtain a baseline image.
2. Using image sensors and a digital machine vision camera, the displacement and motion of every pixel in the image is measured.
3. The data is fed into OptiVibe’s™ custom image processing software which generates Vibragrams™. This image uses a color-coded format that highlights the intensity of vibration.

**Problem Solved: Allied Vision’s Camera Provides a Solution**Challenges are common during a system’s development. “The technical challenges were based on receiving large quantities of data from the camera and converting that data into useful information for the analyst and the customer. The visualization techniques from the software and the video provided by the camera helped to define what was critical in terms of decision making,” explained Schultz.

During the prototype phase, Allied Reliability Group first used Allied Vision’s Prosilica GX1050 Gigabit Ethernet (GigE) camera. The Prosilica GX1050 was used as a general all-purpose camera which offered useful flexibility in terms of high dynamic range, high resolution and fast frame rates. The Prosilica GX1050 was used in a variety of settings which assisted in defining Allied Reliability Group’s needs and led them to their final camera selection.

Allied Reliability Group selected Allied Vision’s Prosilica GE680 GigE camera to capture the images necessary for analysis. The Prosilica GE680 uses OnSemi’s KAI-0340 CCD sensor which delivers VGA resolution at a frame rate of 205 fps. “The Prosilica GE680 offers a great combination of frame rate, resolution and image quality. The speed of the Prosilica GE680 was a big factor as we looked at machinery vibrations. It offered greater flexibility in achieving higher frame rates at reduced resolutions while still offering great image quality. The Prosilica GE680 also offered a simple single connection input/output option to enable the camera’s unilateral control. This helps simplify the process of two-camera acquisition. We were able to synchronize two cameras to troubleshoot an asset for a client that required synchronized OptiVibe™ data from two locations on the machine,” continued Schultz.

 **Value Added: Collaboration and Expertise**Allied Vision and 1st Vision were able to provide unparalleled expertise and support to help Allied Reliability Group bring OptiVibe™ into fruition. “I’ve used Allied Vision cameras in the past and have relied on them for many years. I recall speaking with Allied Vision extensively about our needs and they pointed us in the right direction in terms of camera selection to help make our application successful,” recalled Hay. He continued, “1st Vision also provided great support and their website was useful in finding and comparing cameras.”

OptiVibe™ is slated to be released commercially in January 2016. Allied Reliability Group gave the public a preview of the system during the NIWeek 2015 exhibition. “There was much excitement about it during the show,” recalled Schutz. He concluded, “We share in that excitement too.”

**Profile of Allied Vision**

For over 25 years, Allied Vision has been helping people to see the bigger picture. Allied Vision supplies camera technology and image capture solutions for industrial inspection, science, medicine, traffic monitoring and many more application areas in digital imaging. With a deep understanding of customers’ needs, Allied Vision finds individual solutions for every application, a practice which has made Allied Vision one of the leading camera manufacturers worldwide in the machine vision market. The company has eight locations in Germany, Canada, the United States, Singapore and China and is represented by a network of sales partners in over 30 countries. [www.alliedvision.com](http://www.alliedvision.com)

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