Digital Plant Concepts For Existing Plants

Highly Accurate Context from Simple Photography

Before beginning any revamp or brownfield project, a project team needs to survey existing conditions in order to provide the foundational input to the decision-making process—to understand the *context* within which the asset modification will be designed, built, and operated.

The technologies and processes available to capture and visualize real world conditions have evolved beyond levels and tape measures to technologies such as Total Stations, aerial and ground-based laser scanners, and digital photogrammetry. Each has advantages and disadvantages. Factors to consider are processing time, the quality and precision of the data, the cost of acquisition and processing, and the capability to support engineering workflows.

The use of laser scanners for data acquisition has grown in recent years because it is versatile and is accurate within millimeters. However, laser scanners are still expensive (about $30K for less expensive models), and the technology requires highly skilled, well-trained individuals.

A new technology is emerging that takes data capture out of the hands of specialists and makes it accessible to everyone. This innovation greatly simplifies the capture of existing conditions since it only requires standard photography captured from any digital camera, whether mounted on UAVs or hand-held. Once the imagery is captured, it is processed photogrammetrically to produce a highly accurate 3D mesh, whose accuracy is only limited by the resolution of the source photography. The mesh (or reality model) can then be integrated with other applications such as asset performance management systems to support inspections and maintenance and engineering design systems to support revamp decision making processes.

This technology is revolutionizing the surveying industry and is gaining significant ground in the process industry sector, often used alongside laser scanning. This paper will discuss the practical use of this technology including case studies from the process industry and how is then supports inspection, maintenance and revamp decisions.

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